

UNIVERSITY OF ZAGREB SCHOOL OF MEDICINE

Plan of the course

Diagnostic and Interventional Radiology

Academic year **2016/2017**

prof. dr. sc. Boris Brkljačić

I. COURSE AIMS

To teach students basic physics, algorithms and clinical applications of imaging methods in modern medical diagnosis and image-guided minimal invasive therapy

II. COURSE STRUCTURE

Course hours:

Lectures: 25

Seminar: 25

Clinical practicals: 25

Total hours: 75

Lectures (L): 25 hours

Seminars (S): 25 hours

Practicals (P): 25 hours

Total: 75 hours

III. PLAN OF THE COURSE AND COURSE SCHEDULE

BLOCKS OF THE COURSE

Number of blocks: 1

Block number	Start	End
1.	9.1.2017	27.1.2017

BLOCKS OF THE COURSE

Number of blocks: 1

Block number	Start	End
1.	9.1.2017	27.1.2017

BLOCKS OF THE COURSE SCHEME

Block 1

Date	Time	Group	Course hours type	Theme	Teaching staff
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Date	Time	Group	Course hours type	Theme	Teaching staff
Monday 9.1.2017.	08:45-10:15; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	dr. sc. Ana Hrkać Pustahija, Hrvoje Vavro, pred., Nino Tičinović, dr. med., doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, Danijel Cvetko, dr. med., doc. dr. sc. Mislav Čavka, prof. dr. sc. Boris Brkljačić
	10:15-13:00; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić
	13:30-15:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Hrvoje Vavro, pred., Nino Tičinović, dr. med., doc. dr. sc. Renata Huzjan-Korunić, dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Gordana Ivanac, Danijel Cvetko, dr. med., prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka
	16:30-18:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac
Tuesday 10.1.2017.	08:45-11:30; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić
	11:30-13:00; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Nino Tičinović, dr. med., Hrvoje Vavro, pred., doc. dr. sc. Mislav Čavka, doc. dr. sc. Renata Huzjan- Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić, dr. sc. Ana Hrkać Pustahija, Danijel Cvetko, dr. med.

Date	Time	Group	Course hours type	Theme	Teaching staff
	13:30-15:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Hrvoje Vavro, pred., Nino Tičinović, dr. med., doc. dr. sc. Renata Huzjan-Korunić, dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Gordana Ivanac, Danijel Cvetko, dr. med., prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka
	16:30-18:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac
Wednesday 11.1.2017.	08:45-10:15; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Nino Tičinović, dr. med., Hrvoje Vavro, pred., doc. dr. sc. Mislav Čavka, doc. dr. sc. Renata Huzjan- Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić, dr. sc. Ana Hrkać Pustahija, Danijel Cvetko, dr. med.
	10:45-13:00; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić
	13:30-15:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Hrvoje Vavro, pred., Nino Tičinović, dr. med., doc. dr. sc. Renata Huzjan-Korunić, dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Gordana Ivanac, Danijel Cvetko, dr. med., prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka
	16:30-18:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac
Thursday 12.1.2017.	08:45-11:00; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić

Date	Time	Group	Course hours type	Theme	Teaching staff
	11:30-13:00; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	izv. prof. dr. sc. Vinko Vidjak, Nino Tičinović, dr. med., doc. dr. sc. Jelena Popić Ramač, Hrvoje Vavro, pred., dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka, Danijel Cvetko, dr. med.
	13:30-15:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Hrvoje Vavro, pred., Nino Tičinović, dr. med., doc. dr. sc. Renata Huzjan-Korunić, dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Gordana Ivanac, Danijel Cvetko, dr. med., prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka
	16:30-18:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac
Friday 13.1.2017.	08:45-10:15; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	izv. prof. dr. sc. Vinko Vidjak, Nino Tičinović, dr. med., doc. dr. sc. Jelena Popić Ramač, Hrvoje Vavro, pred., dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka, Danijel Cvetko, dr. med.
	10:45-13:00; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac, prof. dr. sc. Boris Brkljačić
	13:30-15:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Jelena Popić Ramač, izv. prof. dr. sc. Vinko Vidjak, Hrvoje Vavro, pred., Nino Tičinović, dr. med., doc. dr. sc. Renata Huzjan-Korunić, dr. sc. Ana Hrkać Pustahija, doc. dr. sc. Gordana Ivanac, Danijel Cvetko, dr. med., prof. dr. sc. Boris Brkljačić, doc. dr. sc. Mislav Čavka

Date	Time	Group	Course hours type	Theme	Teaching staff
	16:30-18:45; Klinička bolnica Dubrava		Clinical practicals	Practicals - conv.X rays, mammography, ultrasound, CT, MRI, interventional radiology, contrast studies	doc. dr. sc. Renata Huzjan-Korunić, doc. dr. sc. Gordana Ivanac
Monday 16.1.2017.	08:45-12:30; Klinička bolnica Dubrava		Lectures	Lecture - Introduction to the modern imaging methods, applied physics of imaging methods, imaging referral guidelines, clinical decision support	prof. dr. sc. Boris Brkljačić
Tuesday 17.1.2017.	08:45-11:00; Klinička bolnica Dubrava		Lectures	Lecture - Clinical applications of dijagnostic and interventional ultrasound	prof. dr. sc. Boris Brkljačić
	11:30-13:00; Klinička bolnica Dubrava		Lectures	Lecture - Introduction to neuroradiology	prof. dr. sc. Boris Brkljačić
Wednesday 18.1.2017.	08:45-10:15; Klinička bolnica Dubrava		Lectures	Lecture - Introduction to vascular radiology and interventional radiology	prof. dr. sc. Boris Brkljačić
	10:45-12:15; Klinička bolnica Dubrava		Lectures	Lecture - Introduction to breast imaging	prof. dr. sc. Boris Brkljačić
	12:45-13:30; Klinička bolnica Dubrava		Lectures	Lecture - Interventional radiology	izv. prof. dr. sc. Vinko Vidjak
Thursday 19.1.2017.	08:45-12:30; Klinička bolnica Dubrava		Lectures	Lecture - Abdominal Radiology	prof. dr. sc. Boris Brkljačić
Friday 20.1.2017.	08:45-12:30; Klinička bolnica Dubrava		Lectures	Lecture- Imaging Equipment, Image Acquisition and archiving, Contrast media in moder nimaging, Radiation hazards and radiation protection, Introduction to thoracic imaging	doc. dr. sc. Gordana Ivanac
Monday 23.1.2017.	08:45-11:00; Klinička bolnica Dubrava		Seminar	Case-based learning - Musculoskeletal Radiology	doc. dr. sc. Gordana Ivanac
	11:45-13:15; Klinička bolnica Dubrava		Seminar	Case-based learning - Diseases of Lungs	izv. prof. dr. sc. Ivica Mažuranić
Tuesday 24.1.2017.	08:45-10:15; Klinička bolnica Dubrava		Seminar	Case-based learning - Benign Breast Diseases	doc. dr. sc. Gordana Ivanac
	10:45-13:00; Klinička bolnica Dubrava		Seminar	Case-based learning - Malignant Breast Diseases and Breast Cancer Screening	prof. dr. sc. Boris Brkljačić
Wednesday 25.1.2017.	08:45-11:00; Klinička bolnica Dubrava		Seminar	Case-based learning - Musculoskeletal Radiology	doc. dr. sc. Gordana Ivanac
	11:30-13:00; Klinička bolnica Dubrava		Seminar	Case-based learning - Head and neck imaging	doc. dr. sc. Gordana Ivanac
Thursday 26.1.2017.	08:45-12:30; Klinička bolnica Dubrava		Seminar	Case-based learning - Radiology of Urogenital System	prof. dr. sc. Boris Brkljačić
Friday 27.1.2017.	08:45-10:15; Klinička bolnica Dubrava		Seminar	Case-based learning - Gastrointestinal Radiology	doc. dr. sc. Gordana Ivanac
	10:45-13:00; Klinička bolnica Dubrava		Seminar	Case-based learning - Hepatobilliary and pancreatic radiology	prof. dr. sc. Boris Brkljačić

Lectures and Seminars will take place in the Lecture hall of the Department of Radiology, University Hospital “Dubrava“, ground floor, central Department

Practicals will take part in the Department of Diagnostic and Interventional Radiology, University Hospital “Dubrava“, ground floor

IV. EXAMINATIONS

Types of examination and examination dates

In oral exam students will be asked about the basic physics of conventional X-rays, CT, MRI, ultrasound, contrast media, radiation protection. Also they need to understand (a) imaging algorithms in various disorders (e.g. imaging in acute pancreatitis, imaging in cerebro-vascular insult, imaging of breast cancer, imaging of peripheral vascular disease, etc); (b) recognize the basic pathology on conventional X-rays – for instance free air under diaphragm, ileus, renal stones, etc; (c) recognize the basic pathology on CT / MRI / US in various organ systems; (d) basic data about image-guided minimally invasive therapy – interventional radiological procedures (angioplasties, stenting, embolizations, abscess drainages, biopsies)

The attendance is obligatory to all lectures, seminars and practicals. Students may be absent in up to 10% of all teaching modalities.

Regular terms	Date
Winter	February 13, 2017;
	March 15, 2017.
Summer	June 15-July 15, 2017.
Autumn	September 1-30, 2017.

Additional terms

February, March, April,
May – depending on the #
of students

V./I. LIST OF LECTURERS AND TEACHING STAFF

1. prof. dr. sc. Boris Brkljačić
2. doc. dr. sc. Gordana Ivanac
3. izv. prof. dr. sc. Ivica Mažuranić
4. izv. prof. dr. sc. Marko Radoš
5. izv. prof. dr. sc. Vinko Vidjak
6. doc. dr. sc. Jelena Popić Ramač

V./II EXTERNAL ASSOCIATES:

1. dr. sc. Ana Hrkać Pustahija
2. Danijel Cvetko, dr. med.

3. Hrvoje Vavro, pred.
4. Nino Tičinović, dr. med.
5. Josipa Petrović, dr. med.
6. Marija Šimić, dr. med.
7. Niko Radović, dr. med.

V./III UNTENURED LECTURERS:

1. doc. dr. sc. Renata Huzjan-Korunić
2. doc. dr. sc. Mislav Čavka

VI. LITERATURE

01. Michael Y Chen, Thomas L.Pope, David J.Ott. Lange Basic Radiology. Mc Graw Hills 2004.
 02. teaching files on Internet from major U.S. and EU universities may be used as additional literature
- B. Optional:
03. David Sutton. Textbook of Radiology and Imaging, 7th Ed, free download possible
 04. Andy Adam, Adrian Dixon (Eds). Grainger and Allison's Diagnostic Radiology, 5th Ed, Churchill Livingstone