UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN
Faculty of Medicine

Course sylabus – part A

USOS Code: 48SJO-DIAGIMA
ECTS: 6.00
Cycle: 2026

Diagnostic Imaging
Diagnostic Imaging

SUBJECT MATTER CONTENT:

Practical classes – Assessment of oncological treatment response (RECIST), TNM classification, cancer staging, and treatment monitoring. Selected malignancies: colorectal and prostate cancer. Ultrasound examination (US) – practical training.

Lecture – Introduction to radiology and diagnostic imaging, methods of diagnostic imaging: X-ray, mammography, ultrasound, CT and MRI, angiography, physical and technical basics of the functioning of instrumnts, the principle of radiological images creations, artifacts, errors in the performance of the examination. Principles of radiological protection, biological effects. Preparation for X-ray, mammography, CT, MRI, ultrasound, vascular examinations and procedures, indications and contraindications for each type of examination. Contrast agents in radiology - types, use, indications, contraindications, adverse effects. Introduction to modern methods of radiology and diagnostic imaging, radiology vs. artificial intelligence. Basic radiological images of diseases. Screening, preventive programs in radiology. Emergency radiology. Interventional radiology.

Seminar – Diagnostic imaging including types of examinations, their diagnostic value, radiological signs in particular radiological methods in selected diseases: - head including CNS diseases (post-traumatic lesions, stroke, inflammatory, demyelinating lesions, neoplasms, vascular, degenerative diseases), diseases of the pituitary gland, orbit, face, neck including oncology - of the thorax including lung and pleura, mediastinum. Recognizing and differentiating pneumonia, lung tumor, emphysema, atelectasis, and pleural and pericardial cavity fluid. Recognition of basic diseases of the heart, vasculature, including pulmonary embolism, aortic aneurysm and dissection, heart defects. - abdominal cavity with particular emphasis on selected diseases of the liver (focal benign and malignant lesions), biliary tract (lithiasis, neoplasms), pancreas (benign and malignant lesions, inflammatory lesions), spleen (trauma, focal lesions), kidney (inflammatory, focal lesions, lithiasis), adrenal glands (focal lesions), retroperitoneal space (pathologies of lymph nodes, vessels). - pelvis including female and male genital organs, neoplastic diseases, inflammatory lesions. - diagnostic imaging of breast diseases, methods of examination, indications and contraindications for examinations, fine and thick needle biopsy of breast lesions. Classification of lesions and scales. - pediatric radiology, congenital and developmental defects, cancers in children, trauma including maltreated child syndrome, inflammatory

Legal acts specifying learning outcomes: 311/2023;

Discipline: Medicine

Course status: Obligatory

Group of courses: B - major course

ISCED Code: 0912

Field of studies: Medicine

Field: Medicine

Learning profile: -

Form of studies: full-time

Level of studies: uniform master's studies

Year/Semester: 4th year, Medicine in English

Classes types: Practical classes; Lecture; Seminar; Classes;

Classes: Practical classes (10h); Lecture (10h); Seminar (20h); Classes (40h);

Language: ANG

Introductory subject: Anatomy, biophysics, pathophysiology

Prerequisites: Review knowledge of anatomy, biophysics and pathophysiology

Organized by the unit:

Coordinators responsible for the course:

Grzegorz Wasilewski,
grzegorz.wasilewski@uwm.edu.pl

Additional notes:

lesions, neurological diseases, specifics of pediatric examinations. - emergency in diagnostic imaging, trauma.

Classes – Introduction and general information on radiology and diagnostic imaging. Familiarization with the organization and functioning of the diagnostic laboratories: X-ray, ultrasound, mammography, vascular laboratory, CT and MRI. Types of examinations performed in the various laboratories, taking into account their specifics and patient cooperation. Principles of diagnostic laboratory functioning, cooperation with the electroradiology technician, nurse. Hospital information systems. Teleradiology. Radiology diagnostic stations, radiology software. Radiological anatomy including radiological images in different imaging methods. Correct radiological images, diagnostic images without changes. Diagnostic imaging in selected diseases of the CNS, head, neck, chest, abdomen, pelvis, musculoskeletal system, viewing and interpreting diagnostic images of selected disease entities. Indications and contraindications for examinations, selection of an appropriate diagnostic method, radiological symptoms and their interpretation, differentiation of pathological changes, diagnostic pathways in selected clinical problems in diseases of the CNS, craniofacial, neck, breast, diseases of the lungs, mediastinum, heart, vessels, pleura, abdominal cavity, liver, biliary tract, pancreas, kidney, spleen, adrenal glands, gastrointestinal tract, male and female pelvic organs, skeletal system, lymphatic system. Principles of performing, selecting and interpreting of radiological examinations, taking into account the specificity of other specialties such as neurology, neurosurgery, internal diseases including cardiology, endocrinology, gastrology, nephrology, orthopedics, emergency radiology, oncology (including assessment of disease progression, response to treatment), gynecology, urology, laryngology, ophthalmology. Interventional radiology- types of procedures, indications, contraindications, principles of performing them.

TEACHING OBJECTIVE:

Acquire knowledge of the types of examinations performed in radiology and diagnostic imaging and their application to clinical cases. Acquaintance with the principles of functioning of instruments, including the safety of their use, radiological protection, physical principles of radiological images creations in individual imaging methods (x-ray, CT, MRI, ultrasound, mammography, vascular laboratory, surgical radiology). To learn the basics of radiological symptoms, interpretation of examinations, radiological images in various disease entities. Getting acquainted with the diagnostic pathways in selected disease entities, with indications and contraindications to perform, ordering individual radiological examinations.

DESCRIPTION OF THE LEARNING OUTCOMES OF THE COURSE IN RELATION TO THE DESCRIPTION OF THE CHARACTERISTICS OF THE SECOND LEVEL LEARNING OUTCOMES FOR QUALIFICATIONS AT LEVELS 6-8 OF THE POLISH QUALIFICATION FRAMEWORK IN RELATION TO THE SCIENTIFIC DISCIPLINES AND THE EFFECTS FOR FIELDS OF STUDY

Symbols for outcomes related to the discipline:
M/NMA_P7S_WG++++++++++

Symbols for outcomes related to the field of study:
K.8.+, K.7.+, K.5.+, A.U4.+, B.U2.+, F.U7.+, F.W10.+, KA7_WG1+, KA7_WG2+, KA7_WG3+

LEARNING OUTCOMES:

Knowledge (W1) – The graduate knows and understands: F.W10. the issues of the contemporarily employed imaging tests, especially: 1) radiological symptomatology of the basic diseases, 2) the instrumental methods and imaging techniques used in medical surgeries, 3) the indications, contraindications, and patient preparation for individual types of imaging tests, and contraindications against the use of contrast agents;

Knowledge (W2) – The graduate knows and understands: KA7_WG1 human body structure based on vital diagnostic examinations, in particular x-rays, ultrasound images, computed tomography and magnetic resonance imaging;

Knowledge (W3) – The graduate knows and understands: KA7_WG2 physical basics of selected imaging techniques in medicine and the principles of radiological protection, including radioisotope, functional and structural diagnostics in nuclear medicine;

Knowledge (W4) – The graduate knows and understands: KA7_WG3 principles of ultrasound examination (USG) and the basic principles of fine- and coarse-needle biopsy;

Skills (U1) – The graduate is able to: A.U4. formulate conclusions as to the relations between anatomical structures based on intravital diagnostic tests, especially of the radiological type (plain film, tests with contrast agents, computer tomography, and nuclear magnetic resonance);

Skills (U2) – The graduate is able to: B.U2. assess the harmfulness of a specific dose of ionising radiation and follow the rules of radiological protection;

Skills (U3) – The graduate is able to: F.U7. assess the results of radiological tests for the most frequent types of fractures, especially long bone fractures;

Social competences (K1) – the graduate is ready to: M/NM_K. 8. formulating conclusions from own measurements or observations;

Social competences (K2) – the graduate is ready to: M / NM_K. 7. use of objective sources of information;

Social competences (K3) – the graduate is ready to: K.5. perceiving and recognizing own limitations and self-assessment of deficits and educational needs;

Symbols for outcomes related to the field of study:

Practical classes – [] – Analysis and interpretation of selected imaging studies. Practical performance of ultrasound (US) examinations. Teamwork skills.

Lecture – ['W1', 'U1', 'W2', 'K2', 'W3', 'K3', 'W4'] – Presentation of diagnosic imaging methods, indications and contraindications for them in the form of an interactive PowerPoint presentation.

Seminar – ['W1', 'U1', 'W2', 'K2', 'W3', 'K3', 'W4'] – Interactive discussion of clinical cases in small discussion groups including problem-based learning format. Various imaging methods in radiology, indications and contraindications in clinical practice-discussion. PowerPoint presentation.

Classes – ['W1', 'U1', 'K1', 'W2', 'U2', 'K2', 'W3', 'U3', 'K3', 'W4'] – Interpretation of imaging studies from different clinical disciplines

FORM AND CONDITIONS OF VERIFYING LEARNING OUTCOMES:

Lecture (Exam) – [] – 50 test questions without/using multimedia methods. Passing from 60%

Seminar (Part in the discussion) – [] – active participation in discussions and a multimedia presentation

Practical classes (Part in the discussion) – [] – Active participation in classes, contribution to discussions, and assessment of teamwork.

Classes (Competention test) – ['W1', 'U1', 'K1', 'W2', 'U2', 'K2', 'W3', 'U3', 'K3', 'W4'] – Prerequisites for passing are attendance at all classes, active participation, participation in discussion and ability to work in a group. Own work and ability to solve clinical problems. Final test with 30 clinical cases in the form of OSCE using multimedia methods. Pass mark from 60%

REQUIRED LITERATURE:

1. **Learning Radiology, 2nd Edition. Recognizing the Basics**

   Lange S. Walsh G.Herring William; Elsevier; 2011; Pages: ; Tome: ;
2. **Anatomy of Chest Diseases**

   Geraldine Walsh, Sebastian Langemil Reif; Thieme; 2007; Pages: ; Tome: ;

COMPLIMENTARY LITERATURE:

1. **Essential Radiology: Clinical Presentation, Pathophysiology, Imaging**

   Richard B. Gunderman; Thieme; 2006; Pages: ; Tome: ;

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Detailed description of ECTS credits awarded - part B

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1. Contact hours with the academic teacher:

- participation in: Practical classes	10 h
- participation in: Lecture	10 h
- participation in: Seminar	20 h
- participation in: Classes	40 h
- consultation	4 h
	Total: 84 h

Independent work of a student:

- student's own work	66.00 h
	Total: 66.00 h

contact hours + independent work of a student Total: 150.00 h

1 ECTS credit = 25-30 h of an average student's work, number of ECTS

ECTS Points = 150.00 h : 25 h/ECTS = 6.00 ECTS

Average: 6.00 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher - 3.36 ECTS pts

- including the number of ECTS credits for hours of independent work of a student - 2.64 ECTS pts