Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
RUDN University
Institute of Medicine

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

RADIOLOGY

course title

Recommended by the Didactic Council for the Education Field of:

31.05.01 General Medicine

field of studies / speciality code and title

The course instruction is implemented within the professional education programme of higher education:

General Medicine

higher education programme profile/specialisation title

2026

1. COURSE GOAL(s)

The course "Diagnostic Radiology" is included in the program of the specialty "General Medicine" in the direction of 31.05. 01 " General Medicine " and is studied in the 6th semester of the 3rd year. The discipline is implemented by the Department of Oncology and Radiology named after Academician V.P. Kharchenko. The discipline consists of 6 sections and 21 topics and is aimed at training specialists in the program of General Medicine, section Diagnostic Radiology.

The goal of the course is to provide theoretical and practical training of medical doctors in the specialty of General Medicine in matters of modern Diagnostic Radiology.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course "Diagnostic Radiology" is aimed at the formation of the following competencies (parts of competencies) among students: GPC-4, GPC-5, PC-2, PC-6

Table 2.1. List of competences that students acquire through the course study

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
GPC-4	A student is able to use the approved medical radiological devices, as well as to conduct examinations of the patient in order to establish a diagnosis	GPC-4.1. Able to use medical devices in accordance with the current rules of medical care provision, clinical recommendations and treatment protocols, standards of medical care
		GPC-4.2. Able to evaluate the effectiveness and safety of the use of medical devices
		GPC-4.3. A student has mastered the technique of performing typical medical manipulations using the approved medical devices
GPC-5	He/she is able to assess morphofunctional, physiological conditions and pathological processes in the human body to solve professional problems	GPC-5.1 Has mastered algorithms for clinical, laboratory and functional diagnostics in solving professional tasks;
		GPC-5.2 Is able to evaluate the results of clinical, laboratory and functional diagnostics in solving professional tasks;
		GPC-5.3 Is able to determine morphofunctional, physiological states and pathological processes in the human body based on knowledge about the structure of the human body, about functioning of organs and systems in normal and pathological conditions
PC-2	Capable of conducting a patient examination in order to establish a diagnosis	PC -2.7. Able to carry out differential diagnosis with other diseases/conditions, including urgent ones, as well as to establish a diagnosis taking into account the current international statistical classification of diseases and health-related pr

Competence code	Competence descriptor	Competence formation indicators (within this course)
PC-6	Capable of maintaining medical records and organizing the activities of the subordinated nursing personnel	PC -6.3. Is able to keep medical records, including in electronic form.

3. THE COURSE IN THE HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the core/variable/elective* component of B block of the higher educational programme curriculum.

* - Underline whatever applicable.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GPC-4	Able to use devices according to medical care rules, as well as to conduct examinations of the patient in order to establish a diagnosis	Introductory practice for obtaining primary professional skills: patient care (simulation center); Introductory practice for obtaining primary professional skills: patient care; Practice of diagnostic profile: assistant ward nurse; Practice in obtaining primary professional skills: assistant to junior medical staff; General Surgery Biotechnology; Physics; Chemistry; Bioorganic chemistry; Pharmacology;	Neurology, medical genetics, neurosurgery; Endocrinology; Anesthesiology, intensive care, intensive care; Traumatology, orthopedics; General medical skills; Urgent conditions; Topographic anatomy and operative surgery; Hospital surgery, pediatric surgery; Oncology, radiation therapy; Experimental oncology

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GPC -5	Able to assess morphofunctional, physiological conditions and pathological processes in the human body to solve professional problems	Biochemistry; Normal physiology; General Surgery; Biology; Microbiology, virology; Pathophysiology, Clinical pathophysiology; Propaedeutics of internal diseases; Immunology; Pathological anatomy, clinical pathological anatomy; Chemistry; Pharmacology; Bioorganic chemistry; Anatomy; Histology, embryology, cytology;	Obstetrics and gynecology; Oncology, radiation therapy; Molecular genetic methods; Methods of microbiological diagnostics; Phthisiology; Anesthesiology, intensive care, intensive care; Ophthalmology; Methods of cell biology and histology; Topographic anatomy and operative surgery; Forensic medicine; Maxillofacial surgery; Medical forensics; Otorhinolaryngology; Pediatrics; Sectional course
PC-2	Capable of conducting a patient examination in order to establish a diagnosis	General Surgery; Propaedeutics of internal diseases; Microbiology, virology; Immunology; Molecular genetics in practical biology and medicine**; Pathophysiology, clinical pathophysiology; Pathological anatomy, clinical pathological anatomy;	Surgical practice : Assistant surgeon ; Assistant physician of the therapeutic profile: assistant physician of the therapist; General medical practice: assistant to an outpatient clinic doctor ; Practice of obstetrician-gynecological profile: assistant obstetrician; Practice of obstetric and gynecological profile: assistant to a gynecologist; General medical practice: Assistant pediatrician ; Dermatovenerology; Neurology, medical genetics, neurosurgery; Ophthalmology; Faculty Surgery; Occupational diseases; Hospital therapy; Endocrinology; Outpatient therapy; Hospital surgery, pediatric surgery; Pediatrics; Obstetrics and gynecology; Anesthesiology, intensive care, intensive care; Oncology, radiation therapy; Otorhinolaryngology; Reproductive health; Traumatology, orthopedics; Faculty therapy; Maxillofacial surgery; General medical skills; Urgent conditions; Urology; Infectious diseases; Psychiatry, medical

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
			psychology; Allergology; Phthisiology; Endoscopic urology; Telemedicine; Clinical Dentistry; Current issues of neonatology**; Topical Issues of Neonatology**; Cardiology in Quests; Molecular genetic methods; Methods of microbiological diagnostics; Evidence-based medicine; Sectional course
PC-6	Capable of maintaining medical records and organizing the activities of the subordinated nursing personnel	Introductory practice for obtaining primary professional skills: patient care (simulation center); Introductory practice for obtaining primary professional skills: patient care; Practice in obtaining primary professional skills: assistant to junior medical staff; Biostatistics; General Surgery; Propaedeutics of internal diseases; Bioethics**	General medical practice: assistant to an outpatient clinic doctor ; Practice of obstetric and gynecological profile: assistant to a gynecologist; Assistant physician of the therapeutic profile: assistant physician of the therapist; Practice of obstetrician-gynecological profile: assistant obstetrician; Surgical practice : Assistant surgeon ; Public health and healthcare, economics health care; Outpatient therapy; Faculty therapy; Faculty Surgery; Obstetrics and gynecology; Urology; Infectious diseases; Endoscopic urology; Modern methods of medical statistics; Allergology; Oncology, radiation therapy; Ophthalmology; Hospital therapy; Hospital surgery, pediatric surgery; Pediatrics; Anesthesiology, intensive care, intensive care; Telemedicine; Forensic medicine

* To be filled in according to the competence matrix of the higher education programme.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "**DIAGNOSTIC RADIOLOGY"** is 2 credits (72 academic hours).

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**full-time training**)**

Type of academic activities		**Total academic hours**	**Semesters/training modules**
			6
Contact academic hours		*51*	*51*
including:			
Lectures (LC)		0	-
Lab work (LW)		51	51
Seminars (workshops/tutorials) (S)		-	-
Self-studies		*15*	*15*
Evaluation and assessment (exam/passing/failing grade)		*6*	*6*
Course workload	academic hours	*72*	**-**
	credits	**2**	**2**

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Module number Course module titles	**Brief Description of Model Content**	**Type of studying***
Module 1 Physical and technical basics of Diagnostic Radiology	1.1 Types of radiation, their physical nature, diagnostic methods based on different types of radiation. Physical and technical characteristics and properties of X-ray radiation. X-ray protection measures.	LW
	1.2 Introduction to the physical characteristics of ultrasound waves, the operating principles of modern ultrasound devices, the basic methods of this type of radiological diagnostics and the area of application of each of them.	LW
	1.3 Study of the physical principles of X-ray computed tomography and magnetic resonance imaging, areas of application, indications and contraindications for these methods.	LW

	1.4 Principles of radionuclide diagnostic method, classification of radionuclide examinations, principles of choice of radiopharmaceuticals. PET CT.	LW
	1.5 The role of artificial intelligence in modern diagnostic programs	LW
Module 2 Radiological semiotics	2.1 Radiation semiotics and terminology of pathology of chest organs, gastrointestinal diseases, bone pathology in radiography, CT, MRI, ultrasound and scintigraphy	LW
Module 3 Radiology of chest organs	3.1 Roentgenosemiotics of diseases of the chest organs. Projections used in diagnosing diseases of the chest organs. Radiographic anatomy of the chest organs. The role of radiography, CT, MRI, ultrasound and radioisotope methods in assessing the pathology of the chest organs. Fluorography. Principles of radiography description.	LW
	3.2 Radiation diagnosis of inflammatory lung diseases. Clinical and radiological classification of pneumonia. Features of the X-ray picture depending on the localization and pathogen. Atypical pneumonia. The role of CT in the diagnosis of pneumonia.	LW
	3.3 Radiation diagnosis of tumor lesions of the chest organs Peripheral and central lung cancer. The apical form of lung cancer. Mediastinal form of lung cancer. Miliary carcinomatosis. Secondary (metastatic) lung cancer. Pancost's cancer is cancer of the tip of the right lung. Mediastinal lesion with an undetected primary focus. X-ray picture of the lung carcinomatosis milliare. Screening programs for lung cancer detection. The role of artificial intelligence in the diagnosis of lung pathology.	LW

	3.4 Radiation diagnostics of non-neoplastic diseases of the chest organs X-ray signs of various forms of pulmonary tuberculosis. Foreign bodies of the bronchi. Rib fractures. Pneumothorax. Hemothorax. Pulmonary emphysema. Pneumosclerosis. Metastatic pleurisy.Reactive pleurisy. Shadow in the thorax in pleurisy.	LW
	3.5 Radiation diagnostics of cardiovascular diseases. Native radiography. Contrast radiography. Angiography. Echocardiography. MSCT and MRI of the heart. Radiography of heart defects. Radiography of aortic lesions. Coronary angiography of coronary artery stenosis.	LW
	3.6 Radiographic semiotics of mammary gland diseases. The role of mammography, ultrasound, MRI, radionuclide methods in diagnostics of mammary gland pathology. The role and prospects of using artificial intelligence in mammography.	LW
Module 4 Modern principles of diagnostics of pathology of the abdominal cavity and retroperitoneal space	4.1 X-ray examination of the abdominal cavity. Contrast examination of abdominal organs. MSCT and MRI. X-ray of the stomach and 12 duodenum. Esophagography. Enterography. Irrigoscopy. Duodenography.Polypositional Examination. Double contrast. X-ray diagnostics peptic ulcer disease. X-ray diagnosis of cancer of the esophagus and stomach.	LW
	4.2 X-ray diagnosis of colon and rectal cancer. Radiation diagnosis of deverticulitis, diseases Crohn 's disease, ulcerative colitis. X-ray diagnostics intestinal obstruction.	LW
	4.3 Contrast studies of the bile ducts. Role Ultrasound, CT and MRI in the diagnosis of diseases of the liver, biliary tract	LW

	and pancreas.	
Module 5 Skeletal Radiology	5.1 Radiographic semiotics of musculoskeletal diseases	LW
	5.2 Methods of X-ray examination of bones and joints. MSCT and MRI in the diagnosis of skeletal diseases. The main radiological symptoms observed in bone lesions. Features of the X-ray picture during the examination of the skeleton in children. Bone development abnormalities. Tuberculosis of the bone system.	LW
	5.3 Radiological diagnostics of osteoarticular injuries. Features of trauma. The role of radiography, MSCT and MRI scan. Classification and diagnosis of fractures. Features of the X-ray picture of fractures in childhood.	LW
	5.4 Radiation diagnostics for benign and malignant tumors of the osteoarticular system. Features of the X-ray picture of benign tumors of bones and joints. X-ray picture in various types of bone sarcoma. Osteoporosis.	LW
Module 6 Modern principles of diagnosis of urinary system pathology	6.1 Radiation semiotics of urinary system pathology	LW
	6.2 The role of radiography ultrasound, MSCT, MRI, radionuclide methods in the diagnosis of pathology of the urinary system. Excretory urography.	LW

* - to be filled in only for **full** -time training: *LC - lectures; LW - lab work; S - seminars.*

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENT

Table 6.1. Classroom equipment and technology support requirements

Classrooms for Academic Activity Type	Classroom Equipment	Specialized educational/demonstration equipment, software and materials for the mastering of the discipline
Labwork	An auditorium for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	Laboratory and diagnostic equipment of the department's clinical facilities
Seminar	An auditorium for conducting seminar-type classes, group and individual consultations, ongoing monitoring and interim certification, equipped with a set of specialized furniture and multimedia	Laptops, multimedia projector.

Classrooms for Academic Activity Type	Classroom Equipment	Specialized educational/demonstration equipment, software and materials for the mastering of the discipline
	presentation equipment.	
Computer lab	A computer classroom for conducting classes, group and individual consultations, ongoing monitoring and interim certification, equipped with personal computers (in the amount of 3 pcs.), a blackboard (screen) and multimedia presentation equipment.	Laptops, projectors, educational videos, diagrams, and tables.
Self-studies	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to Electronic Informational-Educational Media.	Laptops

7. RECOMMENDED SOURCES FOR COURSE STUDY

Main readings:

1. Komolafe F, Dahniya M.H**.** A Teaching Atlas of Case Studies in Diagnostic Imaging. 2023. https://www.jaypeedigital.com/book/9789354656743
2. Herring William. Learning Radiology : recognizing the basics / W. Herring. - 4th edition - Philadelphia : Elsevier, 2020. - 382 p. : ill. - ISBN 978-0-323-56729-9 : 4730.00.
3. Gupta AK. Diagnostic Radiology: Musculoskeletal and Breast Imaging. 2021. https://www.jaypeedigital.com/book/9789390020553
4. Jain R. Review of Radiology. 2017. https://www.jaypeedigital.com/book/9789385999000
5. Khandelwal N. Diagnostic Radiology: Chest and Cardiovascular Imaging. 2018. https://www.jaypeedigital.com/book/9789352703081https://www.jaypeedigital.com/book/9789352703081

Internet-based sources

- 1. Electronic libraries with access for RUDN students:
  -Electronic library network of RUDN – ELN RUDN http://lib.rudn.ru/MegaPro/Web
  - ELN «University Library online» http://www.biblioclub.ru
  - ELN Urait http://www.biblio-online.ru
  - ELN «Student Advisor» www.studentlibrary.ru
  - ELN «Lan» http://e.lanbook.com/

- 2. Databases and search engines:
  - electronic fund of legal and regulatory and technical documentation http://docs.cntd.ru/

- search system Yandex https://www.yandex.ru/
- search system Google https://www.google.ru/

- abstract database SCOPUS http://www.elsevierscience.ru/products/scopus/

Educational and methodological materials for students' independent work while mastering the discipline/module*: 1. Course of lectures on the discipline "Radiological Diagnostics".

All educational and methodological materials for students' independent work are posted in accordance with the current procedure on the discipline's page in **TUIS**!

DEVELOPERS:

Academician, Professor, Head of the educational **Department of Oncology and Diagnostic Radiology**		A.D. Kaprin
position, educational department	signature	name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

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