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

2023-2024

1. COURSE GOAL(s)

The goal of the course "Radiology" is to equip students with the theoretical and practical knowledge and practical training of doctors in the specialty of medical care in the issues of modern radiological diagnostics of benign and malignant processes.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) "Radiology" is aimed at the development of the following competences /competences in part: GPC-4, GPC-10, 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
		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-10	Able to solve standard tasks of professional activity using information, bibliographic resources, medical and biological terminology, information and communication technologies, taking into account the basic requirements of information security	GPC -10.1. Is able to use modern information and communication tools and technologies in professional activities
		GPC -10 Knows how to comply with the rules of information security in professional activities
		GPC -10.3. Is able to use information and communication technologies, including general and special purpose application software in solving professional tasks
PC-2	Capable of conducting a patient examination in order to establish a diagnosis	PC -2.1. Has the skills of getting information on complaints, history of the patient's life and illness, as well as conducting a complete physical examination of the patient (visual examination, palpation, percussion, auscultation)
		PC -2.2. Able to formulate a preliminary diagnosis and make a plan of laboratory and instrumental examinations of the patient
		PC -2.3. Able to refer the patient to laboratory examination in the presence of medical indications in accordance with the current practice of the provision of medical care, clinical recommendations (treatment protocols) and standards of medical care
		PC -2.4. Able to refer the patient to instrumental methods of examination when indicated in accordance with the current practice of the provision of medical care, clinical

Competence code	Competence descriptor	Competence formation indicators (within this course)
		recommendations (treatment protocols) and standards of medical care
		PC -2.5. Able to refer the patient to medical specialists when indicated in accordance with the current practice of the provision of medical care, clinical recommendations (treatment protocols) and standards of medical care
		PC -2.6. Able to refer the patient to be treated in a hostital or day-care unit when indicated in accordance with the current practice of the provision of medical care, clinical recommendations (treatment protocols) and standards of medical care
		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 problems (ICD)
PC -6	Capable of maintaining medical records and organizing the activities of the subordinated nursing personnel	PC -6.1. He is able make a work plan and a report on his work, issue a passport of a medical (therapeutic) site
		PC -6.2. It is able to analyze the indicators of morbidity, disability and mortality to characterize the health of the attached population
		PC -6.3. Is able to keep medical records, including in electronic form
		PC -6.4. Is able to monitor the performance of official duties by a district nurse and other subordinate medical workers
		PC -6.5. Is able to provide internal quality control and safety of medical activities within the scope of official duties

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the core/variable/elective* component of (B1) 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	General surgery; Physics; Practice: Introductory practice on obtaining primary professional skills: patient's care; Practice for obtaining primary professional skills: assistant of junior medical personnel; Practice of diagnostic profile: assistant of the ward nurse	Neurology, medical genetics, neurosurgery; Faculty Surgery; Obstetrics and gynecology; Medical rehabilitation; Traumatology, orthopedics; Endocrinology; Anesthesiology, resuscitation, intensive care; Oncology, radiation therapy; Reproductive health; Maxillofacial surgery; Emergency Medical Manipulation Practice (Simulation Center)
GPC -10	Able to solve standard tasks of professional activity using information, bibliographic resources, medical and biological terminology, information and communication technologies, taking into account the basic requirements of information security	Mathematics; Medical Informatics; Biochemistry; Pharmacology; General surgery; Biostatistics	Medical rehabilitation; Occupational diseases; Anesthesiology, intensive care, intensive care; Telemedicine
PC-2	Capable of conducting a patient examination in order to establish a diagnosis	General surgery; Pathophysiology, clinical pathophysiology	Dermatovenerology; Neurology, medical genetics, neurosurgery; Faculty therapy; Faculty Surgery; Obstetrics and gynecology; Otorhinolaryngology; Ophthalmology; Occupational diseases; Hospital therapy; Polyclinic therapy; Hospital surgery, pediatric surgery; Pediatrics; Traumatology, orthopedics; Endocrinology; Anesthesiology, intensive care, intensive care; Oncology, radiation therapy; Maxillofacial surgery; Reproductive health; Dentistry; Psychiatry, medical psychology; Current issues of neonatology; Fundamentals of child nutrition Practice of

			surgical profile: assistant surgeon; Practice of obstetric and gynecological profile: assistant gynecologist; Assistant physician of the therapeutic profile: assistant internal diseases physician; General medical practice: assistant to an outpatient clinic doctor; Practice of obstetric and gynecological profile: assistant obstetrician
PC-6	Capable of maintaining medical records and organizing the activities of the subordinated nursing personnel	Propaedeutics of internal diseases; Immunology; General surgery	Public health and healthcare, healthcare economics; Polyclinic therapy; Allergology; Oncology, radiation therapy; Maxillofacial surgery; Faculty Surgery; Ophthalmology; Practice of surgical profile: assistant surgeon; General medical practice: assistant to an outpatient clinic doctor

* 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 "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	7	8	9
Contact academic hours		*51*	*51*			
including:						
Lectures (LC)						
Lab work (LW)		51	51			
Seminars (workshops/tutorials) (S)						
Self-studies		*12*	*12*			
Evaluation and assessment (exam/passing/failing grade)		*9*	*9*			
Course workload	academic hours	**72**	**72**			
	credits	**2**	**2**			

* To be filled in regarding the higher education programme correspondence training mode.

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types

Physical and technical basics of Diagnostic Radiology	1. Types of radiation, their physical nature, diagnostic methods based on different types of radiation.	LC, LW
	2. Properties of various types of radiation, the possibilities of radiological methods in the assessment of various organs, systems, tissues.	LC, LW
	3. Properties of X-rays used for image acquisition in radiation diagnostics	LC, LW
Pulmonary Radiology	1. Diagnostic capabilities of various techniques. How to evaluate the X-ray image of the lungs by syndromes reflecting the morphological structures of the lungs.	LC, LW
	2. Assessment of the pulmonary field size using the signs: the position of the diaphragm, the dimension of the intercostal spaces, the position of the mediastinal organs.	LC, LW
	3. Assessment of lung parenchyma and its changes on X-ray image in the form of translucencies and s hadows. Characteristics of shadows using the criteria: quantity, shape, size, localization, contours, structure, intensity, mobility.	LC, LW
Cardiovascular Radiology	1. Lung pattern changes as a possible sign of heart disease. Decreased lung translucency in hemosiderosis.	LC, LW
	2. Changes of the cardiac arches on chest radiographs in various changes of hemodynamics, leading to hemodynamic of the shape, position, and size of the heart.	LC, LW
	3. Implementation of radiographic analysis for acquired heart defects, in particular mitral and aortic ones, isolated or combined/ complex ones. Analysis of the detected changes in radiological descriptions and conclusions.	LC, LW
Gastrointestinal Radiology	1. When analyzing the X-ray image, determine the phase of the study. In the relief phase, assess the condition of the mucosa in the norm of each part of the digestive tube.	LC, LW
	2. To identify signs of various parts of a healthy digestive canal in the phase of tight filling. To evaluate the functional symptoms (secretion, peristalsis, tone, evacuation) of the digestive tube.	LC, LW
Skeletal Radiology	1. Diagnostic capabilities the techniques used to evaluate various components of the musculoskeletal system. Recognizing features of norm and pathology in the X-ray imaging.	LC, LW
	2. When analyzing the X–ray image - to assess the condition of the soft tissues surrounding the bones and joints.	LC, LW
Basics of Radiotherapy	1. Types of radiation used in radiotherapy, their physical nature, therapeutic methods based on different types of radiation	LC, LW
	2. Principles of planning and conduct of radiation therapy.	LC, LW

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

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)

Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	Microsoft products (OS, office package) (Subscription Enrollment for Education Solutions (EES) No. 56278518 dated 23/04/2019) Guarantor (Agreement No. 13A/46/2018 dated 02/04/2018) Consultant Plus (Information Support Agreement dated 01/09/2013) Regt number of the central office-03-207-7474 from September.2013
Lab work	An auditorium for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	Microsoft products (OS, office package) (Subscription Enrollment for Education Solutions (EES) No. 56278518 dated 23/04/2019) Guarantor (Agreement No. 13A/46/2018 dated 02/04/2018) Consultant Plus (Information Support Agreement dated 01/09/2013) Regt number of the central office-03-207-7474 from September.2013
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 presentation equipment.	Microsoft products (OS, office package) (Subscription Enrollment for Education Solutions (EES) No. 56278518 dated 23/04/2019) Guarantor (Agreement No. 13A/46/2018 dated
		02/04/2018) Consultant Plus (Information Support Agreement dated 01/09/2013) Regt number of the central office-03-207-7474 from September.2013

		Microsoft products (OS, office package) (Subscription Enrollment for Education Solutions (EES) No. 56278518 dated 23/04/2019) Guarantor (Agreement No. 13A/46/2018 dated 02/04/2018) Consultant Plus (Information Support Agreement dated 01/09/2013) Regt number of the central office-03-207-7474 from September.2013
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.	
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.	Microsoft products (OS, office package) (Subscription Enrollment for Education Solutions (EES) No. 56278518 dated 23/04/2019) Guarantor (Agreement No. 13A/46/2018 dated 02/04/2018) Consultant Plus (Information Support Agreement dated 01/09/2013) Regt number of the central office-03-207-7474 from September.2013

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

1. 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.
2. Ilasova E.B., Chekhonatskaya M.P., Priyozheva V.N. Radiation Diagnosis, 2009-, GOELAR-Medicine,-275 S.
3. Sinitsyn E.V., Ustyuzhanin D.V. Magnetic Resonance Imaging/ 2008-, 208 S.

Additional *readings:*

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/

Training toolkit for self- studies to master the course *:

1. The set of lectures on the course "Radiology"
2. The laboratory workshop (if any).on the course _"Radiology"
3. The guidelines for writing a course paper / project (if any) on the course "Radiology".

* The training toolkit for self- studies to master the course is placed   on the course page in the university telecommunication training and information system under the set procedure.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system* to evaluate the competences formation level (GPC-4, GPC-10, PC-2, PC-6) upon the course study completion are specified in the Appendix to the course syllabus.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

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