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Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
RUDN University

Medical Institute

COURSE SYLLABUS

Course title

Three-dimensional x-ray Diagnostic Methods in Dentistry

Specialization

31.05.03 Dentistry

Graduate's Degree

Dentistry

1. COURSE GOAL(s)

The goal of the course is to prepare of a dentist who owns the necessary skills and knowledge in the use of cone-beam computed tomography on the dental admission.

The objectives of the discipline are:

- training in the principles of operation of radiation diagnostics in dentistry
- training of students in radiation safety
- to teach the rules of visualization of anatomical structures and pathological conditions on an x-ray
- use algorithms with software computed tomography

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) “Three-dimensional x-ray Diagnostic Methods in Dentistry” is aimed at the development of the following competences /competences in part: PC-1, PC-5.

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

Competence code	Competence descriptor	Competence formation indicators (within this course)
PC-5	Being able to examine patients to determine a diagnosis when solving professional tasks	PC-5.5. Referral of a patient for an instrumental examination if there are medical indications in accordance with the current procedure for the provision of medical care, clinical recommendations (treatment protocols) for the provision of dental care, considering standards.
		PC-5.6. Referral of a patient for a consultation with specialist doctors if there are medical indications in accordance with the current procedure for the provision of clinical medical care
PC-1	Being able to make an examination of a patient in order to determine a diagnosis.	PC-1.3. Detecting if patients have dentoalveolar, facial anomalies, deformities and prerequisites for their development, defects in the crowns of teeth and dentition on the basis of the patient examination; laboratory, instrumental, and additional examinations in order to make a preliminary/final diagnosis.

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*
PC-5	Being able to examine patients to determine a diagnosis when solving professional tasks	Science of Dental Materials Hygiene	Propaedeutics of Dental diseases Radiology Prosthodontics Prevention and Public Dental Health Oral Surgery
PC-1	Being able to make an examination of a patient in order to determine a diagnosis.	Science of Dental Materials Hygiene	Propaedeutics of Dental diseases Radiology Prosthodontics Prevention and Public Dental Health Oral Surgery

* 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 “Three-dimensional x-ray Diagnostic Methods in Dentistry” is 2 credits (108 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
		4
<i>Contact academic hours</i>		
<i>including:</i>		
Lectures (LC)		
Lab work (LW)	72	72
Seminars (workshops/tutorials) (S)		
<i>Self-studies</i>	36	36
<i>Evaluation and assessment (exam/passing/failing grade)</i>	9	9
Course workload	academic hours	108
	credits	3

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
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<p>1</p> <p>Survey methods in dentistry. Basic and advanced.</p>	<p>Examination of the patient. Basic methods (visual inspection and inspection of the oral cavity). Two-dimensional and three-dimensional methods of radiation survey in dentistry</p>	<p>LW</p>
<p>2.</p> <p>Radiation diagnostics in dentistry. Types of research - Intraoral radiography of teeth and jaws, panoramic zonography. Principles of image acquisition. Indication methods. Disadvantages</p>	<p>Intraoral dental radiography. Isometric far-focus method and X-ray of the teeth. Advantages and disadvantages. Orthopantomography panoramic zonography teeth or jaws.</p>	<p>LW</p>
<p>3.</p> <p>Radiation diagnostics in dentistry. Types of research - cone-beam computed tomography. Principles of obtaining an image. Indication method. Disadvantages.</p>	<p>Invention of the CT scanner. Types of scanners. Principles of obtaining an image. Concepts and terms related to computed tomography.</p>	<p>LW</p>

4. Radiation safety during radiation examination during dental treatment. Types of imaging programs for computed tomography. Application features.	What is a sievert. Effective equivalent dose. absorbed dose. What are dosimeters. Rules for conducting x-ray studies in dentistry.	LW
5. Radiological anatomy on CBCT data. Features visualization of anatomical structures in the maxillofacial region.	Scanning zone. X-ray anatomy of the paranasal sinuses, temporomandibular joint, the upper and lower jaws.	LW
6. The algorithm works with Ez3D2009 program. Construction of the image for evaluation dental pathology.	Software includes Ez3D2009. Algorithms for constructing dental images, panoramic zonograms, implantation planning	LW
7 Workshop: Working with Ez3D2009 program.	Development of manual skills of building a tooth tomography, panoramic zonogram, implantation planning	LW
8 First milestone certification	Intermediate control of knowledge and skills	LW
9 The use of CBCT on the dental admission. Evaluation of channel-root of the tooth system, periodontal, maxillary sinuses.	X-ray semiotics of the main dental diseases (caries, pulpitis, periodontitis, periodontal disease, endotherapy errors). The study of the structure of the canal-root system of the tooth	LW

10 The use of CBCT on the dental admission. Abnormalities of the teeth and jaws. Inflammatory processes in the maxillofacial area, neoplasms and their manifestations.	X-ray semiotics major dental diseases (anomalies teeth and jaws, sinus disease).	LW
11 The algorithm of the program Galileos. Construction of the image for evaluation dental pathology.	The software includes Galileos. Algorithms for constructing dental images, panoramic zonogram, implantation planning	LW
12 Workshop: How to use Galileos	Practicing manual skills in constructing tooth tomography, panoramic zonogram, implantation planning	LW
13 The algorithm works with Romexis Viewer software. Image building for evaluation of dental pathology.	The software includes Romexis Viewer. Algorithms for constructing dental images, panoramic zonogram, implantation planning	LW
14 Workshop: Working with Romexis Viewer software.	Practicing manual skills in constructing tooth tomography, panoramic zonogram, implantation planning	LW
15 The algorithm of the program OnDemand3d. Image building for evaluation of dental pathology.	The software includes OnDemand3d. Algorithms for constructing dental images, panoramic zonogram, implantation planning	LW
16 Workshop: Working with OnDemand3d program.	Practicing manual skills in constructing tooth tomography, panoramic zonogram, implantation planning	LW
17 Practical conference.	Reports on the topics of the course	LW
18 Second milestone certification	Intermediate control of knowledge and skills	LW

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)
236 - Lab work	Classroom for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	Installing the dental chair with HiraDent 654-3 -1 pc. ED 240 ovens with RS422 (Binder) (9010-0101) (LLC Diaem) - 1pc. RC-2ZT Phantom Frasco GmbH head trainer Germany (10130120/190315/0001935) - 1 pc. Dental tools (set) - 10 pcs. Workplace student / teacher as part of the system unit, monitor, keyboard - 1 pcs. Intraoral Camera (10125230/221108/0006472 Korea.) - 1 pc. Ultrasonic scaler DTE-7DLED - 4 pcs.
237, 436 - Seminar	Classroom for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	Classroom, Equipped with a set of specialized furniture, whiteboard;a set of devices includes portable multimedia projector, laptop,projection screen,stable wireless Internet connection. Software: Microsoft Windows,MS Office\Office 365,MS TEAMS,Chrome Monitor LED LG 55" 55UF771V Ultra HD, 100Hz, DVB-T2, DVB-C, DVB-S2, USB, WiFi
437 - Computer lab	Classroom for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	Classroom, Equipped with a set of specialized furniture, whiteboard;a set of devices includes portable multimedia projector, laptop,projection screen,stable wireless Internet connection. Software: Microsoft Windows,MS Office\Office 365,MS TEAMS,Chrome Monitor LED LG 55" 55UF771V Ultra HD, 100Hz,

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
		DVB-T2, DVB-C, DVB-S2, USB, WiFi The workplace of the student / teacher as part of the system unit, monitor, keyboard - 8 pcs., there is an Internet connection. Software: Windows 8.1 Corporate (Microsoft Office Professional Plus 2007, Corporate Licensing Program (Microsoft Subscription) Enrollment for Education Solutions № 86626883от 01.04.2018 г.) Sirona Wibv-systems 1001-02-160-0445 №№ 1)2-3067086, 2016 2)2-2707139 , 2016 3)2-2707136 , 2016 4)2-2707154 , 2016 5)2-2536154 , 2016 6)2-2707122 , 2016 7)2-2695658 , 2016 8)2-2707144 , 2016

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

7. RESOURCES RECOMMENDED FOR COURSE STUDY

a) Main readings:

1. Herring William.

Learning Radiology : recognizing the basics / W. Herring. - 4th edition ; Книга на английском языке. - Philadelphia : Elsevier, 2020. - 382 p. : ill.

2. Technological Adoption and Trends in Health Sciences Teaching, Learning, and Practice / Edited by Samuel Marcos-Pablos and Juan Antonio Juanes-Méndez. - Электронные текстовые данные. - Medical Information Science Reference, 2022. - 387 с.

URL: https://mega.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=513240&idb=0

. b) Additional readings:

1. Mok DWH. Essential Radiology in Head Injure [Текст] : A diagnostic atlas of skull trauma / D. Mok, L. Kreel. - Great Britain : Heinemann Professional Publishing, 1988. - 213 p.

c) Internet sourcers:

Electronic libraries with access for RUDN students:

<http://lib.rudn.ru/MegaPro/Web>

<http://www.biblioclub.ru>

<http://www.biblio-online.ru>

www.studentlibrary.ru

<http://e.lanbook.com/>

Databases and search engines:

<http://docs.cntd.ru/>

<https://www.yandex.ru/>

<https://www.google.ru/>

<http://www.elsevierscience.ru/products/scopus/>

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