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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
RUDN University named after Patrice Lumumba**

Institute of Medicine

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

COURSE SYLLABUS

**CONE BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS PLANNING AND
EVALUATION OF THE EFFECTIVENESS OF DENTAL SOLUTIONS**

course title

Recommended by the Didactic Council for the Education Field of:

31.05.03 Dentistry

field of studies / speciality code and title

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

Dentistry

higher education programme profile/specialisation title

2023-2024

1. COURSE GOAL(s)

The goal of the course “CONE BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS PLANNING AND EVALUATION OF THE EFFECTIVENESS OF DENTAL SOLUTIONS” is to prepare 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) “CONE BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS PLANNING AND EVALUATION OF THE EFFECTIVENESS OF DENTAL SOLUTIONS” is aimed at the development of the following competences /competences in part: PC-5, PC-1.

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

Compe tence 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	Three-dimensional x-ray Diagnostic Methods in Dentistry 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	Three-dimensional x-ray Diagnostic Methods in Dentistry 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 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
<i>Contact academic hours</i>		
including:		
Lectures (LC)	17	17
Lab work (LW)	17	17
Seminars (workshops/tutorials) (S)	-	-
<i>Self-studies</i>	38	38
<i>Evaluation and assessment (exam/passing/failing grade)</i>		

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

Modules	Topics	Types of academic activities
Cone beam computed tomography in the practice of a dentist	Radiation methods for examining dental patients: 1. Basic examination methods in dentistry	LC
	2. Additional examination methods in dentistry: dental radiography and orthopantomography	
	3. Additional examination methods in dentistry: cone beam computed tomography	
	4. Main advantages and disadvantages of each method	
Radiation safety during CBCT. Errors and shortcomings of CT, ways to eliminate them	1. Issues of radiation safety. SanPin norms. Rules for conducting radiological examination methods	LC
	2. Risk groups during research (pregnant women and children)	
	3. Objective and subjective errors of computed tomography. Artifact concept. Types of artifacts, ways to eliminate them.	
X-ray anatomy according to CBCT	1. Visualization of important anatomical structures of the maxilla and mandible for dental treatment planning	LC
	2. Determination of types of bone density according to CT data	
X-ray semiotics according to CBCT data at the therapeutic and periodontal reception	1. Diagnosis of caries and its complications.	LW
	2. Evaluation of the canal-root system of teeth according to CBCT. Malformations and features	
	3. Diagnosis of complications of endodontic treatment	
	4. X-ray picture of apical periodontitis	

	5. The structure of the periodontium. Determination of bone pockets and lesions of the furcation zone according to CBCT data.	
X-ray semiotics according to CBCT data at surgical and ENT appointments	1.Diagnosis of anomalies of teeth and jaws. Visualization principles	LW
	2.Planning of dental implantation. Isolation of the mandibular canal according to CBCT data	
	3.Determining the volume of bone tissue in matters of bone augmentation	
	4.ENT pathology and normal structure of the paranasal sinuses according to cone beam computed tomography	
X-ray manifestations of osteomyelitis of various origins.	1.The concept of osteomyelitis. Classification, types of osteomyelitis. Acute, primary chronic and secondary chronic osteomyelitis of the jaws.	LW
	2.Osteoradionecrosis and drug-induced necrosis of the jaws	
	3.Osteomyelitis of drug addicts. Features of the x-ray picture.	

* - 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)
236 Academic Activity type- Lab work	Classroom for lectures, 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.

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
		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 Academic Activity type- Seminars	Classroom for lectures, 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 Academic Activity type- 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, 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

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

Main readings:

1. Whaites Eric. Essentials of dental radiography and radiology [Текст] / E. Whaites, N. Drage. - 5th ed. ; Книга на английском языке. - London ; New York : Churchill Livingstone : Elsevier, 2013.
2. Oral and Maxillofacial Surgery, Radiology, Pathology and Oral Medicine. Volume One. - Книга на английском языке. - London : Elsevier, 2008. - 272 p

. Additional readings:

1. Mok DWH. Essential Radiology in Head Injure [Текст] : A diagnostic atlas of skull trauma / D. Mok, L. KreeI. - 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/>

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

1. The set of lectures on the course “CONE BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS PLANNING AND EVALUATION OF THE EFFECTIVENESS OF DENTAL SOLUTIONS”

2. The laboratory workshop (if any).on the course “CONE BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS PLANNING AND EVALUATION OF THE EFFECTIVENESS OF DENTAL SOLUTIONS”

3. The guidelines for writing a course paper / project (if any) on the course “CONE BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS PLANNING AND EVALUATION OF THE EFFECTIVENESS OF DENTAL SOLUTIONS”.

4.

* 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 (PC-5, PC-1.) 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).

DEVELOPERS:

Associate professor of the
Dmitrieva
V.S. Department
of General and Clinical
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position, department



signature

E.N.Gvozdikova

name and surname

Head of the Dmitrieva V.S.
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A.M.Avanesov

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HEAD OF EDUCATIONAL DEPARTMENT:

of General
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A.M.Avanesov

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**HEAD
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**First Deputy Director of
Institute of Medicine**



S.N.Razumova

position, department

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name and surname