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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

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

COURSE SYLLABUS

Medical genetics in dentistry

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

2024

1. THE GOALS OF MASTERING THE DISCIPLINE

The purpose of mastering the discipline "Medical Genetics in Dentistry" is the acquisition by the student of knowledge about the structure of the human body on the basis of modern achievements in macro- and microscopic anatomy and knowledge about the structure of organs and organ systems, their topography and development, as well as the formation of their professional medical competence in matters of the structural organization of the main processes of the body's vital activity.

2. REQUIREMENTS to LEARNING OUTCOMES

Mastering the discipline " Medical Genetics in Dentistry " is aimed at developing the following competencies in students:

UC-1; GPC-5; GPC-6; PC-1; PC-2; PC-6

(in accordance with the Federal State Educational Standard of Higher Education (FSSES) 3++ 31.05.03 Dentistry).

Table 2.1. The list of competencies formed by students during the development of the discipline (results of the mastering of the discipline)

Competence code	Competence	Indicators of Competence Formation (within the framework of this discipline)
UC-1	Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy.	UC-1.1. Analysing the problem situation as a system identifying its components and links between them.
GPC-5	Being able to examine patients to determine a diagnosis when solving professional tasks	GPC-5.1. Gathering anamnesis by analysing the patient's complaints, making a physical examination at a dental appointment. GPC-5.2. Formulating a preliminary diagnosis and drawing up a plan for laboratory and instrumental examinations of a dental patient. GPC-5.3. Compiling medical documentation for a dental patient in accordance with regulatory requirements. GPC-5.8. Conducting differential diagnosis with other diseases/conditions, including the urgent ones. GPC-5.9. Making a diagnosis based on the current international statistical classification of diseases and health problems.
GPC-6	Being able to prescribe non-drug and drug treatment, monitor its efficacy and safety when solving professional tasks	GPC-6.1. Developing a plan for dental disease treatment taking into account the diagnosis, age and clinical picture in accordance with the current procedures for the provision of medical care, clinical guidelines (treatment protocols) on the provision of medical care taking into account the medical care standards. GPC-6.2. Selecting medical products (including dental materials) for drawing up a comprehensive plan for dental disease treatment. Following up the treatment of a patient.

Competence code	Competence	Indicators of Competence Formation (within the framework of this discipline)
PC- 1	Being able to make an examination of a patient in order to determine a diagnosis.	PC-1.1. Making an initial examination and/or reexamination of a patient in order to make a preliminary diagnosis. PC-1.2. Receiving information from patients (their relatives/legal representatives); conducting a questionnaire survey of patients regarding their general health status; identifying concomitant diseases in order to make a preliminary 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. PC-1.4. Detecting if patients have risk factors for oncopathology (including various background processes, precancerous conditions) based on laboratory, instrumental and additional examinations in order to make a preliminary/final diagnosis. PC-1.5. Making a preliminary/final diagnosis based on the patient examination; laboratory and instrumental examinations.
PC-2	Being able to prescribe, monitor the efficacy and safety of non-drug and drug treatment	PC-2.6 Providing orthopaedic treatment for persons with defects in teeth, dentition within the temporization procedure, rehabilitation of single defects in the dentition, dental prostheses of up to three units (excluding dental implants prosthetics), partial and complete removable laminar denture using modern treatment methods approved for use in medical practice.
PC-6	Being able to analyze and present in public medical information based on evidence-based medicine, participate in scientific research, introduce new methods and techniques aimed at protecting public health	PC-6.1 Searching for medical information based on evidence-based medicine, interpreting data from scientific publications and/or preparing a presentation to make medical information, the results of scientific research public.

3. THE COURSE IN THE HIGHER EDUCATION PROGRAMME STRUCTURE

Discipline "**Medical Genetics in Dentistry**" refers to the part formed by the participants in the educational relations of block B1.V.07 of the EP HE.

As part of the EP HE, students also master other disciplines and / or practices that contribute to the achievement of the planned results of mastering the discipline "**Medical Genetics in Dentistry**".

Table 3.1. List of Higher Education Program disciplines that contribute to expected learning outcomes

Code	Name of competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
UC-1	Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy.	Assistant dentist (therapist); Assistant dentist (orthopedist); Human Anatomy - Head and Neck Anatomy; Pediatric dentistry; Dental prosthetics (simple prosthetics); Immunology, clinical immunology; Mathematics; Orthodontics and pediatric prosthetics; Otorhinolaryngology; Dental prosthetics (complex prosthetics); Prosthetics for complete absence of teeth; Psychology, pedagogy; Physics; Philosophy; Obstetrics; Pathophysiology - Pathophysiology of the head and neck; Chemistry of biogenic elements**; Dental modeling of teeth**; History of Medicine; Bioelements in medicine**; Medical elementology**;	Gnathology and functional diagnosis of the temporomandibular joint; Pediatric maxillofacial surgery; Maxillofacial prosthetics;
GPC-5	Being able to examine patients to determine a diagnosis when solving professional tasks	Assistant dentist (orthopedist); Dental prosthetics (simple prosthetics); Cariesology and diseases of hard dental tissues; Local anesthesia and anesthesiology in dentistry; General surgery; Orthodontics and pediatric prosthetics; Dental prosthetics (complex prosthetics); Prosthetics for complete absence of teeth; Surgical diseases; Oral surgery;	Gerontostomatology and diseases of the oral mucosa; Gnathology and functional diagnosis of the temporomandibular joint; Pediatric maxillofacial surgery; Maxillofacial prosthetics; Maxillofacial and gnathic surgery; Implantology and reconstructive surgery of the oral cavity;

		<p>Maxillofacial and gnathic surgery; Internal medicine; Neurology; Periodontology; Psychiatry and Narcology; Endodontics; Dermatovenerology; Pediatric dentistry; Propaedeutics of dental diseases; Ophthalmology; Emergency conditions in outpatient dental practice; Pathological anatomy - Pathological anatomy of the head and neck; Obstetrics;</p>	
GPC-6	<p>Being able to prescribe non-drug and drug treatment, monitor its efficacy and safety when solving professional tasks</p>	<p>Dermatology; Pediatric dentistry; Dental prosthetics (simple prosthetics); Immunology, clinical immunology; Cariesology and diseases of hard dental tissues; General surgery; Orthodontics and pediatric prosthetics; Dental prosthetics (complex prosthetics); Prosthetics for complete absence of teeth; Surgical diseases; Oral surgery; Maxillofacial and gnathic surgery; Fundamentals of military training. Life safety; Internal illnesses; Neurology; Periodontology; Psychiatry and Narcology; Endodontics; Pharmacology; Materials Science; Obstetrics; Emergency conditions in outpatient dental practice;</p>	<p>Gnathology and functional diagnosis of the temporomandibular joint; Pediatric maxillofacial surgery; Implantology and reconstructive surgery of the oral cavity; Clinical dentistry; Maxillofacial and gnathic surgery; Maxillofacial prosthetics; Gerontostomatology and diseases of the oral mucosa; Clinical pharmacology;</p>

PC-1	Being able to make an examination of a patient in order to determine a diagnosis.	Assistant dentist (therapist); Assistant dentist (surgeon); Assistant dentist (orthopedist); Assistant dentist (hygienist); Orthodontics and pediatric prosthetics; Pathological anatomy - Pathological anatomy of the head and neck; Dental prosthetics (complex prosthetics); Prosthetics for complete absence of teeth; Fundamentals of military training. Life safety; Radiation diagnostics; Cone beam computed tomography in diagnostics, planning and evaluating the effectiveness of a dental decision; Pediatric dentistry; Immunology, clinical immunology; Dental prosthetics (simple prosthetics); Cariesology and diseases of hard dental tissues; Local anesthesia and anesthesiology in dentistry; Otorhinolaryngology; Propaedeutics of dental diseases; Oral surgery; Maxillofacial and gnathic surgery; Obstetrics; Periodontology; Endodontics; Three-dimensional x-ray diagnostic methods in dentistry**; Three-dimensional computer modeling of teeth**; Chemistry of biogenic elements**; Ophthalmology; Dental modeling of teeth**; 	Dental assistant (general practice), incl. research work; Oncostomatology and radiation therapy; Maxillofacial prosthetics; Gnathology and functional diagnosis of the temporomandibular joint; Pediatric maxillofacial surgery; Implantology and reconstructive surgery of the oral cavity; Maxillofacial and gnathic surgery; Gerontostomatology and diseases of the oral mucosa; Modern endodontics**; Aesthetic restoration of teeth**;
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		Pathophysiology - Pathophysiology of the head and neck;	
PC-2	Being able to prescribe, monitor the efficacy and safety of non-drug and drug treatment	Pediatric dentistry; Cariesology and diseases of hard dental tissues; Local anesthesia and anesthesiology in dentistry; Orthodontics and pediatric prosthetics; Oral surgery; Maxillofacial and gnathic surgery; Periodontology; Endodontics; Innovative technologies in dentistry; Bioelements in medicine**; Medical elementology**; Propaedeutics of dental diseases; Dental prosthetics (simple prosthetics); Dental prosthetics (complex prosthetics); Prosthetics for complete absence of teeth; Infectious diseases, phthisiology; Organization of general patient care; Assistant dentist (surgeon); Assistant dentist (therapist);	Implantology and reconstructive surgery oral cavity; Maxillofacial and Gnathic Surgery; Gerontostomatology and diseases of the oral mucosa; Modern endodontics**; Clinical pharmacology; Aesthetic restoration of teeth**; Clinical dentistry; Gnathology and functional diagnosis of the temporomandibular joint; Pediatric maxillofacial surgery; Maxillofacial prosthetics; Assistant dentist (general practice), incl. research work;
PC-6	Being able to analyze and present in public medical information based on evidence-based medicine, participate in scientific research, introduce new methods and techniques aimed at protecting public health	Dental prosthetics (simple prosthetics); Immunology, clinical immunology; Dental prosthetics (complex prosthetics); Prosthetics for complete absence of teeth; Pharmacology; Ophthalmology;	Dental assistant (general practice), incl. scientific research work; Gnathology and functional diagnosis of the temporomandibular joint; Pediatric maxillofacial surgery; Maxillofacial prosthetics; Clinical dentistry;

* - filled in accordance with the matrix of competencies of higher education programme.

** - elective disciplines/practices

4. THE DISCIPLINE WORKLOAD AND ACADEMIC ACTIVITIES

The total labor intensity of the discipline " **Medical genetics in dentistry** " is **3** credit units.

Table 4.1. Types of academic activities during the period of the HE program mastering

Type of academic activities	TOTAL, academic hours (ac.h.)	Semester(s)			
		9			
Classroom learning, ac.h.	64	64			
including:					
Lectures (Lec)	-	-			
Lab work (Lab)	64	64			
Practical/seminar classes	-	-			
Self-studies, academic hours	38	38			
Evaluation and assessment (exam or pass/fail grading)	6	6			
Total workload of the discipline	ac.h.	108	108		
	credits.	3	3		

5. THE COURSE MODULES AND CONTENTS

Table 5.1. The content of the discipline and types of academic activities

Name of the discipline section	Contents of the section (topic)	Type of academic activities
Section 1 Heredity and pathology	Topic 1.1. Medical genetics in the structure of the biomedical sciences of man. Heredity and health. Mutations as an etiological factor in hereditary diseases.	Lab
	Topic 1.2. Classification of hereditary diseases. Heredity and pathogenesis. Heredity and clinical picture. Heredity and disease outcomes	Lab
Section 2 Semiotics of hereditary pathology and principles of clinical diagnostics	Topic 2.1. General and particular semiotics of hereditary pathology. Morphogenetic variants of development and their significance in the diagnosis of hereditary pathology. Anthropometry.	Lab
	Topic 2.2. Congenital malformations. Family approach in the diagnosis of hereditary pathology.	Lab
	Topic 2.3. Clinical and genealogical method for the diagnosis of hereditary diseases. Clinical features of the manifestation of hereditary diseases. Graphic representation of a pedigree. Pedigree analysis. Genealogical analysis in monogenic diseases. Genealogical analysis in multifactorial diseases	Lab

Name of the discipline section	Contents of the section (topic)	Type of academic activities
Section 3 Chromosomal diseases	Topic 3.1. Classification of chromosomal diseases. Frequency, pathogenesis and clinical features of chromosomal diseases. Clinical characteristics of some chromosomal syndromes (trisomy syndromes, partial aneuploidy syndromes).	Lab
	Topic 3.2. Methods for diagnosing chromosomal diseases. Treatment of chromosomal diseases	Lab
Section 4 Monogenic diseases	Topic 4.1. Classification of monogenic diseases. Genetic heterogeneity and clinical polymorphism of monogenic diseases.	Lab
	Topic 4.2. Methods for laboratory diagnosis of monogenic pathology (biochemical methods, molecular genetic methods).	Lab
Section 5 Multifactorial diseases	Topic 5.1. The most common nosological forms. General and private mechanisms for the implementation of hereditary predisposition. Factors and principles for identifying individuals with an increased risk of developing diseases with a hereditary predisposition. Ecogenetic diseases.	Lab
Section 6 Congenital and hereditary dental diseases	Topic 6.1. General characteristics of the structure of the teeth. Genetic control of normal development and formation of dental tissues. Genetic factors in the formation of dental anomalies.	Lab
	Topic 6.2. Classification of anomalies in the development of teeth and dentition. Anomalies in the size and shape of teeth (macrodentia, microdentia, fused teeth, doubling, invagination of teeth, abnormal tubercles and enamel pearls, taurodentism).	Lab
	Topic 6.3. Hereditary diseases and syndromes with anomalies in the size and shape of the teeth. Anomalies in the number of teeth (dental agenesis, supernumerary teeth). Hereditary disorders of the formation of the structure of the teeth. Anomalies of teething. Hereditary anomalies of malocclusion.	Lab
Section 7 Congenital malformations of the maxillofacial region	Topic 7.1. Cleft lip and palate. The most common monogenic syndromes are cleft lip and palate. Atypical clefts of the craniofacial region. Principles of treatment and rehabilitation of patients with congenital orofacial clefts. Problems of rehabilitation of patients with	Lab

Name of the discipline section	Contents of the section (topic)	Type of academic activities
	congenital orofacial clefts. Principles of prevention of orofacial clefts	
Section 8 Dental diseases of multifactorial nature.	Topic 8.1. Multifactorial malformations of the craniofacial region and dentition, syndromic forms Common dental diseases of a multifactorial nature (genetic aspects of caries, genetic aspects of periodontal disease)	Lab
Section 9 Prevention of congenital and hereditary dental pathology.	Topic 9.1. Medical genetic counseling. Methods of prenatal diagnosis of hereditary diseases. Methods for detecting chromosomal disorders and monogenic diseases. Problems of medical genetic counseling and treatment of hereditary diseases in dentistry.	Lab

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENT

Table 6.1. Logistical and material provision of the discipline.

Classroom for Academic Activity Type	Classroom Equipment	Specialized educational/laboratory equipment, software and materials for the mastering of the discipline
Lecture	An auditorium for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations. (classrooms 245, 249)	Technical means: multimedia projector Laptop, WiFi available Internet access. Software: Microsoft products (OS, office suite, including MS Office / Office 365, Teams)
Laboratory	An auditorium for laboratory work, individual consultations, current control and intermediate certification, equipped with a set of specialized furniture and equipment.	Visual aids, computer presentations, projector, tables, dummies, simulators, posters
Classroom for students' self-studies	Classroom for self-studies of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to the internet.	

7. RECOMMENDED SOURSES for COURSE STUDIES

Main literature:

- Genetics in Dentistry GP Pal, NK Mahato. ISBN 8184489412, 9788184489415
Publisher: Jaypee Brothers Medical Publishers Pvt. Limited, 2010 - 210 pages.

- Genetics in Dentistry Paperback –2014. ISBN-10:3659562947- ISBN-13:978-3659562945- by Sanjeev Laller, Mamta Malik, C. Anand Kumar. Publisher: LAP LAMBERT Academic Publishing. 180 pages
- Pediatric oral and maxillofacial surgery: Publisher: Saunders; 1st edition (April 9, 2004) Language: English. Hardcover: 488 pages. ISBN 978-0-7216-9691-1
- Kutcipal, E. (2013). Pediatric oral and maxillofacial surgery. *Dental Clinics*, 57(1), 83-98.
- Koch G. et al. (ed.). Pediatric dentistry: a clinical approach. – John Wiley & Sons, 2017.

Additional literature:

- Muhamad, A. H., & Watted, N. (2019). Genetics in pediatric dentistry: A review. *International Journal of Applied Dental Sciences* 2019; 5 (3): 401, 408.
- Divaris, K. (2019). The era of the genome and dental medicine. *Journal of Dental Research*, 98(9), 949-955.
- Khan, M. I., Ahmed, N., Neela, P. K., & Unnisa, N. (2022). The human genetics of dental anomalies. *Global Medical Genetics*, 9(02), 076-081.
- PRESCOTT, G. H., & BIXLER, D. (1968). Implications of genetics in dental practice. *Dental Clinics of North America*, 12(1), 57-68.
- Gonçalves, J., Marques, H., Saleiro, R., Ferreira, Â., Ferreira, A., Ferreira, Â. T., & Ferreira Sr, A. (2023). Ewing's sarcoma of the zygoma: a very rare location. *Cureus*, 15(3).
- Railean, S., Gudumac, E., Bernic, J., Poștaru, C., & Ursu, D. (2023). Pediatric Tumors And Congenital Anomalies In Oral & Maxillo-Facial Surgery.
- Bouchard, C., Troulis, M. J., & Kaban, L. B. (2022). Pediatric Dentoalveolar Surgery. In *Peterson's Principles of Oral and Maxillofacial Surgery* (pp. 191-210). Cham: Springer International Publishing.
- Kaban, L. B., Bouchard, C., & Troulis, M. J. (2009). A protocol for management of temporomandibular joint ankylosis in children. *Journal of Oral and Maxillofacial Surgery*, 67(9), 1966-1978.
- Troulis, M. J., Troulis, M., & Kaban, L. B. (2013). *Minimally invasive maxillofacial surgery*. PMPH-USA.

Internet sources

1. RUDN ELS and third-party ELS, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System - RUDN EBS <http://lib.rudn.ru/>
- ELS "University Library Online" <http://www.biblioclub.ru>
- EBS Yurayt <http://www.biblio-online.ru>
- ELS "Student Consultant" www.studentlibrary.ru
- EBS "Lan" <http://e.lanbook.com/>
- EBS "Trinity Bridge"

2. Databases and search engines:

- electronic fund of legal and normative-technical documentation
<http://docs.cntd.ru/>
- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.ru/>
- Abstract database SCOPUS
<http://www.elsevier.com/locate/SCOPUS>

Learning toolkits for self-studies during the development of the discipline:*

1. A course of lectures, presentations, video materials on the discipline "**Medical genetics in dentistry**".

2. Guidelines for the implementation and execution of control and independent work on the discipline "**Medical genetics in dentistry**".

* - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the page of the discipline **in TUIS** (the university telecommunication educational and information system).

8. EVALUATION TOOLKIT AND GRADE SYSTEM FOR ASSESSMENT

Evaluation Toolkit (ET) and a point-rating system (PRS)* for assessment the level of competence formation (part of competencies) based on the results of mastering the discipline "**Medical Genetics in Dentistry**" are presented in the Appendix to this Work Program of the discipline.

* - ET and PRS are formed on the basis of the requirements of the relevant local regulatory act of the RUDN

DEVELOPERS:

Senior Lecturer, Department of
Pediatric Dentistry and
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Position, educational department

Imad Katbeh

Signature

name and surname.

HEAD OF EDUCATIONAL DEPARTMENT:

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HEAD OF HIGHER EDUCATION PROGRAMME:

Head department, professor,
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