

**Ukraine Ministry of Health  
Kharkiv National Medical University  
Faculty of Dentistry  
Department of Pediatric Dentistry and Implantology  
Educational Program for Training Specialists of the Second (Master's)  
Level, Higher Education Training 22 "Healthcare"  
in Specialty 221 "Dentistry"  
SYLLABUS OF THE COURSE  
"MODERN TECHNOLOGIES OF NONREMOVABLE  
ORTHODONTIC APPLIANCES »**

5<sup>th</sup> year

Compulsory or elective educational component \_\_\_\_\_ elective \_\_\_\_\_

Mode of the educational component \_\_\_\_\_ off-line \_\_\_\_\_  
(off-line; mixed; on-line)

Field of knowledge \_\_\_\_\_ 22 "Healthcare"  
(code and name of the field of knowledge)

Specialty \_\_\_\_\_ 221 «Dentistry»  
(code and name of the specialty)

Educational and professional program \_\_\_\_\_ «Dentistry» \_\_\_\_\_


Of the second (master's) level of higher education

Course \_\_\_\_\_ fifth \_\_\_\_\_

The syllabus of the discipline was approved at  
the meeting of the Department of Pediatric  
Dentistry and Implantology

Protocol from "30" August 2021 year № 1

Head of Department

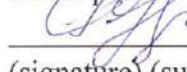
 \_\_\_\_\_ prof. Nazaryan RS  
(signature) (surname and initials)

"30" August 2021

Approved by the methodical commission of  
KhNMU on problems of professional training  
dental profile

Protocol from  
"02" September 2021 year №4

Chairman of the methodical commission of  
KhNMU on problems of professional training  
dental profile

 \_\_\_\_\_ prof. Ruzin GP  
(signature) (surname and initials)

"02" September 2021

**Kharkiv – 2021.**

**Developers:** Nazaryan Rozana Stepanivna, Khmiz Tetyana Grigorivna, Komarov Alexey Kimovich

**Teachers:** Nazaryan R.S., Khmiz T. G., Komarov A. K.

**Teacher information:**

Nazaryan Rozana Stepanivna - Doctor of Medical Sciences, Professor, Head of Pediatric Dentistry and Implantology Department, specialization Pediatric Dentistry, Surgical Dentistry, Therapeutic Dentistry, Orthodontics.

Khmiz Tetyana Grigorivna - Candidate of Medical Sciences (PhD), Associate Professor of the Department of Pediatric Dentistry and Implantology, specialization: Pediatric Dentistry, Orthodontics

Komarov Alexey Kimovich - Assistant Professor of the Department of Pediatric Dentistry and Implantology, specialization Pediatric Dentistry, Therapeutic Dentistry, Orthodontics.

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**Full-time consultations:** schedule and place according to the schedule of the department.

**On-line consultations:** schedule and place by prior arrangement with the teacher

**Location:** classes are held in the UDC KhNMU

**Information about discipline**

Name of indicators	Field of knowledge, direction of training, educational and qualification level	Characteristics of the discipline	
		full-time education	full-time education
Number of credits – 7,0	Training direction <u>1201 "Medicine"</u> (Code name)	Regulatory	
Total hours –210	Specialty: <u>DENT 7.12010005</u> (Code name)	<b>Year of training:</b>	
		5th	-
		<b>Semester</b>	
		9th	-
Hours for the day (or evening) form of education: classroom – 50 self-learning - 160	Education level: Specialist of the second (master's) level	<b>Lectures</b>	
		0 hr.	-
		<b>Practical, seminar</b>	
		50 hours	-
		<b>Laboratory</b>	
-	-	-	-

		<b>Independent work</b>	
		160 hours	-
		<b>Individual tasks: -</b>	
		Type of control: credit	

Educational program of higher education of Ukraine, second (master's) level, educational qualification, assigned - (master's) degree, field of knowledge - 22 Healthcare, specialty 221 "Dentistry" is based on the Law of Ukraine "«Про вищу освіту» and the resolution of the Cabinet of Ministers of Ukraine 01.02.2017 № 53 «Про внесення змін до постанови Кабінету Міністрів України від 29.04.2015 р. № 266» ", in accordance with the order of the Ministry of Education and Science of Ukraine dated 01.06.2016 № 600 «Про затвердження та введення в дію Методичних рекомендацій щодо розроблення стандартів вищої освіти»."

The program of the course determines the prerequisites for access to education, orientation and main focus of the program, the amount of ECTS credits required for a (master's) degree, a list of general and special (professional) competencies, normative and variable content of training, formulated in terms of learning outcomes and control requirements quality of higher education.

The department accepts qualified students of any race, national or ethnic origin, sex, age, people with special needs, any religion, sexual orientation, gender, veteran status or marital status for all rights, privileges, programs and activities, provided to university students.

### 1. **The purpose and objectives of the discipline**

"Modern technologies of nonremovable orthodontic appliances" defined ultimate goals of discipline "Orthodontics", which are based on EPP preparation of doctor by profession under the block of content modules (Science Training) is the basis for building the content of the course of your choice. Description of the objectives formulated through ability as targets (actions). Based on the final objectives for each module or thematic module formulated specific targets in a certain abilities (actions) targets that achieve the ultimate objective of the study subjects.

**Discipline status:** the main format of the discipline is mixed - a discipline that has support in the Moodle system, teaching the discipline, combines traditional forms of classroom learning with elements of distance learning, which uses available interactive information technology (ZOOM, Moodle), face-to-face and distance counseling

2. **Methods of training.** Clinical (curation of children with orthodontic anomalies and deformations), on phantoms, digital information (presentations, video materials, methodical recommendations, lectures), scientific (participation in scientific researches in the discipline), control (tests, situational tasks, assessment of practical skills defence a case history) are used for carrying out the lessons

### 3. **Recommended literature**

#### Basic literature:

1. Fleece PS Leonenko GP, Filonenko VV Doroshenko NM Ed. PS Flis «Orthodontics. Dentognathic Anomalies and Deformations ». - "Medicine", Kyiv 2015 - 176 p.

2. Fleece PS Vlasenko AZ, Chupin SA "Manufacturing technology orthodontic and orthopedic designs in childhood." - Kyiv: "Medicine", 2013 - 256 c.

#### **Further Reading:**

1. Fleece PS TRIL SI VP Voznyuk "Children's dental prosthesis." - Kyiv: "Medicine", 2011 - 200 p.
2. Fleece PS TRIL SI Voznyuk VP Leonenko GP Detskoe zubnoe protezyrovanye. - Kyiv: Medicine, 2011 - 192 p.

1.<http://medprice.com.ua/ukr/articles/prorizuvannya-zubiv-u-ne...>

2.<http://zdravotvet.ru/prorezyvanie-zubov-u-grudnichkov/>

3.<http://medical-wiki.in.ua/hvorobi-zubiv/nekariozni-urazhenny...>

4.<http://mednews.in.ua/home/ditjacha-tematika-psihologija-rozv...>

5.<http://ukrefs.com.ua/page,2,127246-Anomalii-formirovaniya-i-...>

6.[http://allref.com.ua/uk/skachaty/hvorobi\\_tverdih\\_tkanin\\_zuba](http://allref.com.ua/uk/skachaty/hvorobi_tverdih_tkanin_zuba)

7.<http://ppt4web.ru/medicina/profilaktika-stomatologicheskikh-...>

8.<http://www.studfiles.ru/preview/4510583/9>.<http://antyseptiky.com/nevidkladna-dopomoga-v-stomatologiyi/>

#### **4. Prerequisites and co-requisites of the discipline**

The elective course "Modern technologies of nonremovable orthodontic appliances" is based on a previous study of human anatomy; histology, embryology and cytology, medical biology, medicinal chemistry, biological and bioorganic chemistry, physics, roentgenology, propaedeutics of orthopedic dentistry, orthodontics and integrated with these disciplines; The main provisions of the discipline should be applied in the study of related disciplines during 5 years of study, is the basis for preparation for the licensing exam EDKI, preparation for study in higher education institutions in the programs of the third educational and scientific level of higher education.

#### **Learning outcomes**

After study of discipline the elective course "Modern technologies of nonremovable orthodontic appliances" " student should know and be able to:

- conduct anthropometric methods jaw models;
- ortopantomogramu describe and conduct its analysis;
- TRG decipher (a lateral and direct projection);
- determine the extent of the jaws on the basis of decoding TRG;
- identify individual genetic profile orthodontic patient;
- put the final diagnosis;
- a plan of treatment;
- receive constructive bite;
- conduct photometry and its analysis;
- analyze 3D diagnosis of dental disease;
- zuboschepnyh diagnose abnormalities and deformities;
- conduct a differential diagnosis of clinical forms teeth abnormalities;
- to prepare a fitting orthodontic teeth rings and tubes;
- prepare the patient for a permanent orthodontic treatment equipment;
- adjust to the individual shape orthodontic tooth crown or orthodontic ring;
- activate and adjust removable and non-removable orthodontic appliances design.

## The content of the discipline

### 1. Topics of lectures The program does not provided

#### 2. Topics of practical classes

(Total hours – 50)

№	<i>Topic</i>	<i>Hours</i>
1.	<p><b>Topic 1.</b> The term "normal" in orthodontics. The definition of health anomaly deformation. Morphological and functional parameters are normal. Definitions "average standard rate", "functional dentition rule", "optimal individual rate." Six elements of the tooth-maxillofacial harmony Andrews. The mechanism of orthodontic tooth movement. Theories and concepts of orthodontic movement. The concept of "optimal orthodontic force."</p>	4
2.	<p><b>Topic 2.</b> Philosophy of treatment of patients with dentognathic anomalies with nonremoveable appliances depending on age. Types of fixed orthodontic appliances used during temporary and mixed occlusion. Indications for their use. Features of orthodontic treatment of adult patients.</p>	4
3.	<p><b>Topic 3.</b> Orthodontic rings, tubes, buttons, their characteristics and functional purpose. Types of orthodontic rings, their characteristics. Classification of orthodontic rings. Selection of rings and preparation of teeth for their fixation. Standard and individual rings, indications for their use. Characteristics of orthodontic tubes, their types and identification. Characteristics of orthodontic buttons, their types, indications for their use.</p>	4
4.	<p><b>Topic 4.</b> Characteristics of orthodontic wires, their types and applications. Classification of orthodontic wires, their types. History of the issue. Factors determining the strength of the orthodontic wires. Characteristics of wires in size and shape. Physico-mechanical properties of materials from which wires are made. Steel wires, individual and preformed. Nitinol, nitinol-titanium wires, their physical properties. Beta-titanium wires. Bioarcs, their physicochemical properties. Characteristics of thermo wires. The shape of the dental arch and the sequence of changes of the wires at the stages of treatment.</p>	4
5.	<p><b>Topic 5.</b> Orthodontic accessories, characteristics and their use in the treatment of braces (ligatures, elastics, separators, springs, elastic chains). Characteristics of ligatures used to fix the wires in the bracket. Metal, elastic ligatures. Elastics, their characteristics, elastic rings for fixing wires, for moving teeth, for orthodontic separation of teeth. Elastic threads and indications for their use. Elastic chains, their classification and characteristics. Springs that cover and open the space, characteristics and indications for use.</p>	4
6.	<p><b>Topic 6.</b> Braces. Their identification, design and functional characteristics. Types of braces. Signs of identification. Bracket wing, number and their characteristics. Characteristics of braces bases. The groove of the bracket and its types. Angulation, torque, offset, inset, etc. Bracket systems. Self-ligating brace systems. Indications and contraindications to the treatment of orthodontic patients using fixed braces. Errors and complications in the treatment of braces.</p>	4
7.	<p><b>Topic 7.</b> Characteristics of orthodontic instruments for removable and non-removable elements of equipment, their functional purpose. Characteristics of tools used to fix braces (positioner, tweezers, probe). Tools used to remove braces and rings. Characteristics of tools for the formation of orthodontic wires and bends of I, II, III order and various geometric shapes. Characteristics of materials for fixing braces.</p>	5

8.	<b>Topic 8.</b> Anchorage (support) in orthodontic treatment. Types of supports (intraoral, extraoral). Factors influencing the state of support (skeletal, dental). Moyer's support classification. Choosing a fulcrum by a doctor. Removable and non-removable devices, and elements of the system that provide full-fledged anchorage. Features of providing anchorage in the treatment of braces. Types of microimplants. Indications for their use.	5
9.	<b>Topic 9.</b> Principles of biomechanics in orthodontics. Biomechanics in the treatment of orthodontic pathology.	4
10.	<b>Topic 10.</b> The retention period of the results of orthodontic treatment. Conditions for ensuring the stability of results. The concept of the retention period. Factors that ensure the stability of treatment results (aesthetic, functional, morphological). Removable and non-removable retention devices, their advantages and disadvantages. The concept of disease recurrence.	4
11.	<b>Topic 11.</b> Complications in the treatment of fixed equipment. Violation of fixation of braces. Their analysis and methods of elimination. Errors in diagnosis; at the planning stage and the period of active orthodontic movement of teeth. Violation of the conditions of compliance with the stability of treatment results.	5
12.	<b>Topic 12.</b> Credit.	4
	<b>Total</b>	<b>50</b>

### 3. Independent work (Total hours - 160)

№	Topic	Hours	Type of control
1.	<b>Preparation for practical classes (theoretical, of practical skills, abilities) numbers are: №№ 1 - 12</b>	<b>50</b>	<b>Current at workshops</b>
2.	<b>Concept of growth and development of teeth-maxillofacial system.</b> Prenatal and postnatal growth and development of the teeth-jaw system. Areas and types of maxillofacial complex: vault of skull, base of skull, upper jaw, lower jaw. Theories of growth: bone, cartilage, functional.	5	Current at workshops
3.	<b>Paraclinical methods of patient with deformation.</b> Paraclinical methods of diagnosing functional and morphological state of the tooth-maxillofacial complex: biometrics models of jaws, spirometry, electromyography, aksiohrafija, occlusiography, paradontohrafija. Defining the mineralization of bone.	5	Current at workshops
4.	<b>Radiographic methods in orthodontics.</b> Defining the mineralization palatal suture. Orthopantomography, its parameters and the importance of information for planning orthodontic treatment. X-ray bone. Radiography TMJ: in Parma for Schuler, computed tomography, 3D computed tomography.	6	Current at workshops

5.	<b>Treatment plan. Features algorithm of actions in patients with dentognathic anomalies with bracket technique.</b> Differential diagnosis. Establishing the final diagnosis. Treatment plan. Compromises treatment. The algorithm is a permanent braces treatment technology.	4	Current at workshops
6.	<b>Anchorage (support) for orthodontic treatment.</b> Types of bearings (intraoral, extraoral). Factors affecting the state support (skeletal, teeth and jaws). Classification of support for Moyer's. Choice fulcrum doctor. Removable and non-removable devices, elements and systems that provide full anchorage. Features provide the treatment anchorage bracket technique. Types miniscrew. Indications for their use.	4	Current at workshops
7.	<b>The mechanism of orthodontic movement of teeth.</b> Theories and concepts of orthodontic displacement. The concept of "optimal orthodontic force".	5	Current at workshops
8.	<b>Interdisciplinary diagnosis of a patient with dentognathic anomaly and deformity.</b>	5	Current at workshops
9.	<b>Clinical methods of diagnosis of a patient with dentognathic anomaly.</b> Algorithm of static and dynamic inspection. The importance of determining the parameters of facial aesthetics, smile, dentition and teeth for planning orthodontic treatment.	4	Current at workshops
10.	<b>Cephalometry.</b> Features of the diagnostic process in dental-alveolar and gnathic forms of occlusion anomaly.	6	Current at workshops
11.	<b>Frontal and sagittal cephalometry.</b> The main angular and linear parameters. Radiological characteristics of the parameters of the dental-maxillary complex in I, II, III class of Angle occlusion anomaly.	6	Current at workshops
12.	<b>Indications and contraindications to the treatment of orthodontic patients using fixed appliances.</b>	4	Current at workshops
13.	<b>Errors and complications in the treatment with braces.</b>	6	Current at workshops
14.	<b>Preparing the patient for treatment with fixed braces.</b> Age indications for the use of braces. Therapeutic preparation, rehabilitation of the oral cavity. Assessment of the condition of the hard tissues of the teeth. Professional oral hygiene. Characteristics of methods and subjects of oral hygiene. Functional training. Eliminate bad habits. Surgical preparation for orthodontic treatment. Psychological preparation for orthodontic treatment.	4	Current at workshops
15.	<b>Additional intraoral orthodontic appliances that are used along with non-removable braces (lip bumper, tongue flap, quad-helix, bi-helix, flex developer). Apparatus for rapid expansion of the palatal suture.</b> Lip bumper: indications for use. Installation and activation technique. Damper for the tongue: indications for use, varieties, installation technique. Quad- and bi-helix: indications for use. FD (flex developer), Forsus device: indications for use. Types of devices used for rapid expansion of the palatal suture (Derichsweiler apparatus, maxillary expander, etc.), indications for their use. Structural elements, the mechanism of their action.	8	Current at workshops

16.	<b>Orthopedic extraoral devices.</b> Specification, term and direction of action of orthopedic forces. Indications for the use of orthopedic forces by age. Facial protraction mask. Chin sling. Facial arch Indications for use.	6	Current at workshops
17.	<b>Devices for distalization of teeth.</b> Types of devices for distalization of teeth (removable and non-removable; intraoral and extraoral). Structural elements, the mechanism of their action. Clinical and laboratory stages of their manufacture. Standard devices and individually made. Indications for their use.	8	Current at workshops
18.	<b>Characteristics of devices used to stabilize molars.</b> The importance of molars to ensure adequate orthodontic treatment. Natural anatomical and topographic and artificial factors to ensure the stabilization of molars. Apparatus and elements of orthodontic appliances that ensure the stability of molars.	8	Current at workshops
19.	<b>Orthodontic stage in orthognathic treatment of patients with gnathic forms of anomalies.</b> Development of orthognathic surgery. Aesthetic and psychological aspects of orthognathic surgery. Indications for surgery and the possibility of surgery. Terms of surgical intervention and sequence of stages of rehabilitation. Prediction of treatment results. The importance of inter-integrated planning and treatment at the stages of orthodontic training, surgery and post-surgical orthodontic correction and stabilization of results.	8	Current at workshops
20.	<b>Preparation for credit</b>	<b>8</b>	<b>Final control</b>
	<b>Total hours:</b>	<b>160</b>	

### **Discipline policy and values.**

In order to successfully complete the relevant course, it is necessary to regularly attend practical classes; to have theoretical preparation for practical classes, according to the subject; not to be late and not to miss classes; perform all necessary tasks and work in each lesson; be able to work with a partner or in a group; contact the curators of the course on various issues on the subject of classes and receive it when you need it.

Students can discuss different tasks, but their performance is strictly individual. You are not allowed to write off, use any kind of software, tips, use a mobile phone, tablet or other electronic gadgets during classes for purposes other than the learning process. Students are not allowed to be late for practical classes.

Visiting patients during the curation in the hospital is possible, provided that students have the appropriate uniform, a health book with a note about the timely medical examination.

Students with special needs can meet with the teacher or warn him before the start of classes, it can be done by the head of the group on the students request. If you have any questions, please contact the teacher.

Students' participation in research and conferences on this topic is encouraged.



All students of KhNMU are protected by the Regulations on prevention and settlement of Cases Related to Sexual Harassment and Discrimination at Kharkiv National Medical University, designed to determine an effective mechanism for resolving conflict situations related to discrimination and sexual harassment. on the basis of the following regulations of Ukraine: Constitution of Ukraine; Law of Ukraine "On Education"; Law of Ukraine "On Higher Education"; Law of Ukraine "On Principles of Prevention and Counteraction of Discrimination in Ukraine"; Law of Ukraine "On Ensuring Equal Rights and Opportunities for Women and Men"; Convention for the Protection of Human Rights and Fundamental Freedoms; Convention for the Suppression of Discrimination in Education; Convention on the Elimination of All Forms of Discrimination against Women; General Recommendation № 25 to Article 4, paragraph 1, of the Convention on the Elimination of All Forms of Discrimination against Women, General Comment № 16 (2005)"Equal rights for men and women to use economic, social and cultural rights" (Article 3 of the International Covenant on Economic, Social and Cultural Rights; Committee on Economic, Social and Cultural Rights of the United Nations); education in the spirit of respect for human rights and fundamental freedoms (UNESCO), the Concept of the State Social Program for Equal Rights and Opportunities for Women and Men until 2021. Kharkiv National Medical University ensures education and work, that is free from discrimination, sexual harassment, intimidation or exploitation. The University admits the importance of confidentiality. All persons, responsible for the implementation of this policy, (staff of deans' offices, faculties, institutes and the Center of Gender Education, members of the student government and ethics committee, vice-rector for research and teaching) are confidential, regarding those, who report or accuse of discrimination. or sexual harassment (except where the law requires disclosure and / or when disclosure by the University is necessary to protect the safety of others).KhNMU creates a space of equal opportunities, free from discrimination of any national, racial or ethnic origin, sex, age, disability, religion, sexual orientation, gender, or marital status. All rights, privileges, programs and activities, granted to students or staff of the University, apply to anybody, without exception, in case they are properly qualified. The anti-discrimination policy and the policy of counteracting sexual harassment of KhNMU are confirmed by the Codex of Corporate Ethics and the Charter of KhNMU.

#### The rules of behavior in University and on classes

It is important for students to follow the rules of good behavior at the university. These rules are common to all, they also apply to all teachers and staff and are not fundamentally different from the generally accepted norms.

During classes it is allowed:

- leave the audience for a short time if necessary and with the permission of the teacher;
- drink soft drinks;
- take photos of presentation slides;
- take an active part in the class

Forbidden:

- eat (except for persons whose special medical condition requires another - in this case, medical confirmation is required);
- smoking, drinking alcohol and even low-alcohol beverages or drugs;

- use obscene language or use words that offend the honor and dignity of colleagues and faculty;
- gambling;
- to damage the material and technical base of the university (damage inventory, equipment; furniture, walls, floors, litter the premises and territories);
- shouting, shouting or listening to loud music in classrooms and even in corridors during classes.

#### Plagiarism and academic integrity

The Department of Pediatric Dentistry and Implantology maintains zero tolerance for plagiarism. Students are expected to constantly raise their awareness of academic writing. The first lessons will provide information on what to consider plagiarism and how to properly conduct research and scientific research.

#### Occupational Safety control

At the beginning of the first lesson of the course the teacher will explain the basic principles of labor protection by conducting appropriate training. It is expected that everyone should know where the nearest evacuation exit is, where the fire extinguisher is, how to use it, and so on.

**The procedure for informing about changes in the syllabus:** the necessary changes in the syllabus are approved by the methodical commission of KhNMU on the problems of professional training of dental profile and published on the website of KhNMU, the website of the Department of Pediatric Dentistry and Implantology of KhNMU.

#### Policy of learning activities assessment

##### Assessment of current learning activities (CLA)

When assessing the mastery of each topic of the discipline and for the final lesson (FL), the student is graded according to the traditional 4-point system: "excellent", "good", "satisfactory" or "unsatisfactory".

The final score for the current learning activity (CLA) and the final lesson (FL) is defined as the arithmetic mean of the traditional grades for each class and FL, rounded to 2 decimal places and listed in a multi-point scale according to the standard table.

##### Assessment of the final lesson

The final lesson (FL) is conducted in accordance with the curriculum of the discipline and thematic plane, during classes

To to help prepare for the final lesson, the following materials are available at the information stand of the department:

- basic tasks ("Krok 2. Dentistry");
- list of theoretical questions;
- list of practical skills;

- a list of drugs, for prescriptions;
- list of medical records for dentistry;
- criteria for assessing the knowledge and skills;
- schedule of reworks of missed classes during the semester.

#### **Assessment of individual student tasks**

At the meeting of the department should be approved a list of individual tasks (participation in reports at student conferences, profile competitions, preparation of analytical reviews with presentations) with the definition of the number of points for their implementation, which can be added as incentives (not more than 10).

Points for individual tasks are awarded to the student only by the commission (commission - head of the department, head teacher, group teacher), once, only under the conditions of their successful implementation and defense. The total amount of points for CLA may not exceed 120 points.

#### **Assessment of students independent work**

Assimilation of topics that are submitted only for independent work is checked during the final lesson and differential credit.