ELECTIVE COMPONENT SYLLABUS

MODERN TECHNOLOGIES OF NON-REMOVABLE ORTHODONTIC APPLIANCES

Specialty: **221 "Dentistry"**
Educational and professional program: **Dentistry**
Component code in the educational program: **EC 80**
Level of higher education: **second (master's)**
Form of education: **full-time (full-time)**
Year of study : **5**
Semester(s): **IX (fall)**
Type of educational component: **elective**
Academic year: **2028 -2029**

Volume: **4 ECTS credits (120 hours)**
Training sessions: **practical classes** , **consultations**
Final control: **credit**
Prerequisites: **human anatomy; histology, embryology and cytology; medical biology; medical chemistry; biological and bioorganic chemistry; microbiology, virology and immunology; therapeutic dentistry; orthopedic dentistry; surgical dentistry; pediatric therapeutic dentistry; pediatric surgical dentistry.**

Department/division: **Department of Pediatric Dentistry and Implantology,** 51 Peremohy Ave., 5th floor
Head of the educational component: **Prof. Alina Grigorova** ,
email: ao.hryhorova@knmu.edu.ua
Educational component page in the KNMU Distance Learning System (Moodle): https://distance.knmu.edu.ua/course/view.php?id=2685

DESCRIPTION OF THE EDUCATIONAL COMPONENT

The study of the educational component "Modern Technologies of Fixed Orthodontic Equipment" is aimed at deepening the knowledge of students about diagnostic techniques and clinical possibilities of using fixed orthodontic equipment for the treatment and prevention of dentofacial anomalies at different stages of development of an orthodontic patient.

OBJECTIVE : is determined **by the final goals** established on the basis of the OPP for the training of a doctor by specialty in accordance with the block of its sections (natural science training), and is the basis for building the content of the academic discipline.

LEARNING OUTCOMES:

Know:

concepts of norm, anomaly, deformation; prenatal and postnatal periods of growth and development of the maxillofacial complex; theories of growth of the maxillofacial complex; six elements of dento-maxillofacial harmony according to Andrews; factors that ensure the growth and development of the jaws; physiological stages of increasing the height of the bite; clinical and biological foundations of orthodontic treatment; clinical methods of diagnosing patients with dento-maxillofacial anomalies and deformations; paraclinical methods of diagnosing the functional and morphological state of the dento-maxillofacial complex; radiological methods of examination in orthodontics; features of the algorithm of action when treating patients with braces; history of the development of braces; systems of braces and orthodontic accessories; preparation of patients for treatment with fixed appliances;

indications for complex methods of treatment of orthodontic patients; types of braces; characteristics of braces; characteristics and types of orthodontic arches; physicochemical properties of materials from which arches are made; characteristics of ligatures, elastics, separators, springs, elastic chains used in treatment with braces; types of devices for distalization of teeth; clinical and laboratory stages of manufacturing devices for distalization of teeth;

devices and elements of orthodontic equipment that provide stability (anchorage) of molars; complex methods of treatment of orthodontic patients; retention period, its duration and justification; the concept of disease recurrence; types of retention devices;

Be able

- to conduct anthropometric methods of studying jaw models;
- describe the orthopantomogram and conduct its analysis;
- decipher the TRG (in lateral and direct projection);
- determine the degree of jaw development based on the decoding of the TRG;
- determine the individual genetic profile of an orthodontic patient;
- make a final diagnosis;
- draw up a treatment plan;
- get a constructive bite;
- conduct photometry and its analysis;
- analyze 3D diagnostics of dental pathology;
- diagnose dental and jaw anomalies and deformations;
- conduct differential diagnostics of clinical forms of dental and maxillofacial pathologies;
- prepare teeth for fitting orthodontic rings and tubes;
- prepare the patient for orthodontic treatment with fixed appliances;
- adjust an orthodontic crown or orthodontic ring to the individual shape of the tooth;
- activate and adjust removable and fixed orthodontic appliance designs;
-position the bracket system

CONTENT OF THE EDUCATIONAL COMPONENT

List of topics for practical classes (40 hours) :

1.Philosophy of treatment of patients with dentofacial anomalies with fixed braces depending on age. Types of fixed orthodontic appliances. Features of orthodontic treatment of adult patients. Orthodontic rings, tubes, buttons, their characteristics and functional purpose.
2.Characteristics of orthodontic arches, their types and applications. Classification of orthodontic arches, their types. Factors determining the force of action of an orthodontic arch. Characteristics of arches. The shape of the dental arch and the sequence of changes in arches at the stages of treatment. Orthodontic accessories, characteristics and their applications in treatment with braces (ligatures, elastics, separators, springs, elastic chains).
3.Braces. Their identification, structural and functional characteristics. Types of braces. Identification features. Characteristics of the bracket base. Bracket groove and its types. Angulation, torque, offset, inset, etc. Braces systems. Self-ligating bracket systems. Indications and contraindications for the treatment of orthodontic patients using fixed bracket technology. Errors and complications in treatment with bracket technology.
4.Characteristics of orthodontic instruments for removable and non-removable elements of the equipment, their functional purpose. Instruments used for removing brackets and rings; for forming orthodontic arches and bends of I, II, III order and various geometric shapes. Characteristics of materials for fixing brackets.
5.Anchorage (support) in orthodontic treatment. Types of supports. Moyer's classification of support. Selection of the support point by the doctor. Types of microimplants. Indications for their use.
6.Principles of biomechanics in orthodontics. Biomechanics in the treatment of orthodontic pathology.
7.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.
8.Complications in treatment with fixed appliances. **Credit.**

List of topics for independent work of education seekers (80 hours)
1.Preparation for practical classes (theoretical, development of practical skills and abilities)
2.Drawing up a treatment plan. Features of the algorithm of actions in the treatment of patients with dentofacial anomalies using the braces technique.
3.Interdisciplinary diagnosis of a patient with dentofacial anomalies and deformities.
4.Indications and contraindications for the treatment of orthodontic patients using fixed braces.
5.Additional intraoral orthodontic appliances used in conjunction with fixed braces (lip bumper, tongue flap, quad-helix, bi-helix, flex-developer). Devices for rapid expansion of the palatal suture.
6.Orthodontic extraoral appliances. Head cap. Facial protraction mask. Chin sling. Facial arch. Indications for use.
7.Devices for distalization of teeth.
8.Characteristics of devices used to stabilize molars.
9.Orthodontic stage in orthognathic treatment of patients with gnathic forms of dentofacial anomalies.

VTS is aimed at deepening and consolidating theoretical knowledge obtained during classroom training and contributes to the formation of professional competencies. The results of VTS are subject to control and are included in the final knowledge control.

Consultations: online, with prior registration on the course page in the Distance Learning System.

Teaching methods: performing exercises and practical work, solving situational tasks and cases, standardized patient method

EVALUATION

Current educational activity (PND). Assessment of the success of education seekers is carried out in accordance with the Instructions for assessing the educational activity of higher education seekers at KhNMU (https://knmu.edu.ua/documents/normatyvni-dokumenty-navchalnogo-proczesu/). The assessment for a practical or final lesson is from 2 to 5 points. Submitting assignments late for unwarranted reasons entails a reduction in the grade in accordance with the percentage of delay in time from the time of completing the assignment. Assignments are checked within 24 hours. Grades are posted in the electronic journal. Unsatisfactory grades are worked out in accordance with the Regulations on the procedure for working out academic classes by students of KNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf).

At the end of the semester, the average grade for the semester is converted into a multi-point grade (12 0 – 20 0 points) in accordance with Table 1 of the Assessment Instructions (see above). The arithmetic average of the PND for both semesters constitutes **the total learning activity (GNA)** .

Individual tasks (I) are rated up to 10 points.

Discipline grade (OD). OD = ZND + IZ

Appealing the results of the final control is carried out in accordance with the procedure established at the KNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_apel_kontrol.pdf).

EDUCATION COMPONENT POLICIES

Recommendations for course work: actively participate in all forms of work in classes, devote 1-2 hours daily to independent work and preparation for classes, ask questions during classes , attend consultations, submit assignments on time , and complete all forms of control.

Attendance at classes. Attendance at lectures and practical classes is mandatory. The uniform during offline classes is a white medical gown. If you are more than 5 minutes late, you may not be admitted to the class. Missed classes are made up in accordance with the Regulations on the procedure for students of KNMU to complete classes (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf).

Academic integrity. KhNMU stands on zero tolerance for manifestations of academic dishonesty. Any violations of the principles of academic integrity entail liability in accordance with the procedure established at KNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_ad-1.pdf).

The use of electronic gadgets and artificial intelligence tools is permitted only with the permission of the teacher.

Policy on individuals with special educational needs. Applicants with special educational needs should contact a teacher to develop an individual educational trajectory.

Teacher response time: 24 hours.

Technical requirements for working on the course:

- access to a computer, laptop, tablet or smartphone
- corporate Google account with your own photo
- skills in working with Google Workspace (Google Meet, Docs, Sheets, Slides, Forms) and Moodle

Technical support: ASU (ev.shevtsov@knmu.edu.ua), Google (tehotdelknmu@gmail.com), Moodle (al.korol@knmu.edu.ua)

RECOMMENDED SOURCES

1. Flis P.S. Orthodontics. - Vinnytsia: "New Book", 2019. - 312 p.
2. Children's dental prosthetics: textbook / P.S. Flis, S.I. Tril, V.P. Voznyuk; edited by Prof. P.S. Flis. — 2nd ed., corrected — K.: VSV “Medicina”, 2015. — 200 p.

3. M. Saadia , R. Valencia« Dentofacial Orthopedics in the Growing Child : Understanding Craniofacial Growthinthe Management of Malocclusions ", 2022 - 896 p.
4. B. Melsen , C. Luzi« AdultOrthodontics 2nd Edition ", 2022 - 480 p.
5. Standard of medical care for bite anomalies (mesial occlusion, open bite, deep) https://www.dec.gov.ua/wp-content/uploads/2025/03/dn_360_03032025_dod.pdf
6. Orthodontics and maxillofacial orthopedics evidence-based clinical guidelines https://www.dec.gov.ua/wp-content/uploads/2025/03/2023_620_kn-ortodontiya.pdf
7. Medical care standards distal occlusion https://www.dec.gov.ua/wp-content/uploads/2023/04/smd_620_03042023.pdf

Head of the Department of Pediatric Dentistry
and implantology
doctor of medicine, professor Alina GRIGOROVA