MINISTRY OF HEALTH OF UKRAINE
BUKOVINIAN STATE MEDICAL UNIVERSUTY

APPROVED
Vice-Rector of higher educational establishment on Scientific and Pedagogical Work
_____ Oksana GODOVANETS
"30" 06 2025

STUDENT GUIDE (SYLLABUS) of studying the discipline

"ORTHODONTICS"

Field of knowledge 22 Healthcare
Speciality 221 Dentistry
Educational degree Doctor of Philosophy
Year of study I, II, III
Form of education Full-time (day, evening), part-time
Department Paediatric Dentistry

Approved at the meeting of the Department of Paediatric Dentistry on "23" 06 2025 (Minutes No. 15).

Head of Department _____ Tetiana KITSAC

Approved by the Subject Methodological Commission for Dental Disciplines of Bukovinian State Medical University "26" 06 2025 (Minutes No. 6).

Chair of the Subject Methodological Commission _____ Natalia KUZNYAK

Chernivtsi – 2025

1. GENERAL INFORMATION ABOUT SCIENTIFIC AND PEDAGOGICAL STAFF WHO TEACH THE ACADEMIC DISCIPLINE

Department	of Paediatric Dentistry
Surname, first name, patronymic of scientific and pedagogical staff, position, academic degree, academic title, e-mail	Oksana Ivanivna Godovanets – Doctor of Medical Sciences, Professor, Professor of the Department of Paediatric Dentistry at the higher education institution godovanec.oksana@bsmu.edu.ua Lyudmila Georgievna Grinkevich – Doctor of Philosophy, Assistant at the Department of Paediatric Dentistry grynkevych.l@bsmu.edu.ua
Department website on the official university website	https://www.bsmu.edu.ua/stomatologiyi-dityachogo-viku/
Department website	https://sites.google.com/bsmu.edu.ua/childrens-dentistry-department/
E-mail	dentistry_child@bsmu.edu.ua
Address	87 Ruska Street, Chernivtsi
Contact	+38 (050)0794102

2. GENERAL INFORMATION ABOUT THE ACADEMIC DISCIPLINE

Status of the discipline	Elective
Number of credits	12
Total number of hours	360
Lectures	20
Practical classes	80
Independent work	260
Type of final assessment	test

3. DESCRIPTION OF THE ACADEMIC DISCIPLINE (ABSTRACT)

The academic discipline "Orthodontics" covers a wide range of issues in modern orthodontic science, integrating data from phylogenetic, ontogenetic, morphological, functional, biomechanical, genetic and clinical-preventive approaches. The course provides an in-depth study of the structural and functional organisation of the dentofacial system in children, adolescents and adults, taking into account the age-related patterns of growth and development of the craniofacial complex. Particular attention is paid to the analysis of the aetiological factors of malocclusion and dental arch anomalies, their interrelation with systemic and local influences, including genetic determinants, epigenetic factors and environmental modifiers.

The discipline covers modern methods of morphometric and functional diagnostics, craniofacial analysis, three-dimensional visualisation, digital modelling technologies, as well as the principles of planning and biomechanical justification of orthodontic treatment. A significant part of the programme is devoted to the study of the latest treatment strategies, including hardware, surgical, combined and interdisciplinary approaches. Thanks to the integration of fundamental and applied aspects, the discipline provides training for PhDs capable of conducting scientific research aimed at improving methods of prevention, early intervention and treatment of orthodontic anomalies.

The subject of study is the patterns of formation, development and pathology of the dentofacial system, modern concepts of aetiopathogenesis and classification of anomalies, morphofunctional features of occlusion at different ages, principles of clinical biomechanics of orthodontic intervention, methods of diagnosis and prognosis, modern approaches to prevention, treatment and rehabilitation of children with anomalies of the dentofacial apparatus, as well as models of organisation of orthodontic care and interdisciplinary interaction.

4. EDUCATIONAL DISCIPLINE POLICY

4.1. ***List of regulatory documents:***

- Regulations on the organisation of the educational process – https://cutt.ly/ArUqCMFh;
- Instructions for assessing the academic performance of PhD students at BSMU in the context of the implementation of the European Credit Transfer System for the organisation of the educational process – https://surl.li/acuduy;
- Regulations on the procedure for making up missed and uncredited classes – https://cutt.ly/jrUqBS36;
- Regulations on appealing the results of final knowledge assessment of higher education applicants – https://cutt.ly/3rUqMAbV;
- Code of Academic Integrity – https://cutt.ly/FrUq1ljK;
- Regulations on the prevention of academic plagiarism – https://cutt.ly/MrUq6QAt;
- Regulations on the procedure and conditions for the selection of elective disciplines by students – https://cutt.ly/srUwo6Ci;
- Regulations on the Procedure for Recognising Learning Outcomes Achieved through Non-Formal and/or Informal Education – https://cutt.ly/SrUwp1ie;
- Rules of Conduct for Students – https://cutt.ly/ErUq72rZ;
- Internal labour regulations – https://cutt.ly/UrUwiACe;
- Regulations on the training of students pursuing a Doctor of Philosophy or Doctor of Science degree –https://surl.lu/aygfsk;
- Regulations on the procedure for awarding the degree of Doctor of Philosophy and revoking the decision of a one-time specialised academic council at Bukovinian State Medical University https://surl.li/zoclfi;
- Regulations on the Commission on Biomedical Ethics https://surl.lt/hcmnln;
- Regulations on primary documentation and the commission for verifying primary documentation of scientific research at Bukovinian State Medical University https://surl.li/dgjnpe.

4.2. ***Policy on compliance with the principles of academic integrity for students:***

- independent completion of individual tasks and correct citation of sources of information when borrowing ideas, statements, or information;
- creation of an effective system for preventing and detecting academic plagiarism in scientific works.

4.3. ***Policy on compliance with the principles and norms of ethics and deontology by students:***

- acting in professional and educational situations from the standpoint of academic integrity and professional ethics and deontology;
- compliance with the university's internal regulations and rules of conduct for students, being tolerant, friendly and thoughtful in communication with students and staff of departments, healthcare institutions, etc.;
- awareness of the importance of examples of human behaviour in accordance with the norms of academic integrity and medical ethics.

4.4. ***Policy on student attendance:***

- attendance at all classes (lectures, practical classes) is mandatory for the purpose of ongoing and final assessment of knowledge (except in cases of valid reasons).

4.5. ***Policy on deadlines and making up for missed or uncredited classes by higher education students:***

- make-up classes for missed classes are held according to the schedule for make-up classes and consultations.

5. PREREQUISITES AND POSTREQUISITES OF THE ACADEMIC DISCIPLINE (INTERDISCIPLINARY CONNECTIONS)

List of academic disciplines on which the study of the academic discipline	List of academic disciplines for which the foundation is laid as a result of studying the academic discipline
Orthodontics	
Prevention of dental diseases	

6. OBJECTIVES AND TASKS OF THE ACADEMIC DISCIPLINE:

6.1. **The aim** of teaching the academic discipline is to provide third-level higher education (PhD) students with a comprehensive systematic understanding of the mechanisms of development, diagnosis, prevention and treatment of dentofacial anomalies, mastering modern evidence-based concepts of orthodontic clinic and biomechanics, as well as preparing them for independent research activities and multidisciplinary clinical interaction.

6.2. **The** main **objectives** of the discipline are:

- in-depth study of the phylogenetic, ontogenetic and morphofunctional foundations of the formation of the dentofacial apparatus and the patterns of occlusion development
- critical analysis of modern classifications of dentofacial anomalies and craniofacial deformities, their conceptual approaches and controversial aspects
- the study of the etiopathogenesis of anomalies, taking into account genetic, embryological, epigenetic, functional and environmental factors
- mastering modern diagnostic methods, including clinical, instrumental and digital technologies, analysis of their evidence and prognostic value
- developing competencies in clinical biomechanics of orthodontic tooth movement, optimisation of orthodontic interventions and prediction of results
- familiarisation with modern approaches to prevention and early intervention in children at high risk of developing anomalies
- studying the principles of management of craniofacial congenital defects and traumatic injuries in childhood
- mastering modern methods of orthodontic treatment, including hardware, surgical, digital and individualised protocols
- developing skills in analysing the organisation of orthodontic care, quality management and the implementation of evidence-based standards in clinical practice
- developing interprofessional collaboration, in particular with speech therapists, paediatricians, maxillofacial surgeons and other specialists.
- preparing applicants for scientific work, including developing analytical thinking skills, critical evaluation of literature and development of their own scientific research in the field of orthodontics.

7. COMPETENCIES THAT THE ACADEMIC DISCIPLINE HELPS TO DEVELOP:

Integral: The ability to generate new ideas, solve complex problems in dentistry and related interdisciplinary problems, apply scientific and pedagogical methodologies, and conduct independent scientific research whose results are scientifically novel and have theoretical and practical significance.

General:

ZK02. Ability to search for, process and analyse information from various sources.
ZK03. Ability to think abstractly, analyse and synthesise.
3K04. Ability to work in an international context.

Special (professional):

SK01. Ability to conduct original research, achieve scientific results that create new knowledge in dentistry and related fields of medicine, and can be published in leading international scientific journals.
SK02. Ability to initiate, develop and implement complex innovative projects in the field of dentistry and related interdisciplinary projects.
SK05. Ability to generate new ideas for the development of dental theory and practice, identify problems, pose and solve research problems in the field of healthcare, evaluate and ensure the quality of dental research.
SK06. Ability to apply modern digital technologies, databases and other electronic resources, specialised software in scientific and educational activities.
SK07. Ability to critically analyse, evaluate and synthesise new and complex ideas in the field of dentistry and related interdisciplinary issues.
SK08. Ability to engage in continuous self-development and self-improvement.

8. LEARNING OUTCOMES.

The academic discipline ensures the formation of the following learning outcomes (LO):

LR01. To have conceptual and methodological knowledge in dentistry and related subject areas, as well as research skills sufficient to conduct scientific and applied research at the level of the latest global achievements in the relevant field, to acquire new knowledge and/or implement innovations.

LR02. Have a deep understanding of the general principles and methods of human health sciences, the main trends in their development, as well as the methodology of scientific research, and apply them in their own scientific research in the field of dentistry and in teaching practice.

RN04. Formulate and test hypotheses; use appropriate evidence to substantiate conclusions, in particular the results of theoretical analysis, experimental research, statistical data analysis, and available literature data.

RN05. Apply modern tools and technologies for searching, processing and analysing medical and biological information, in particular statistical methods for analysing large volumes and/or complex structures of data, specialised databases and
information systems.

RN06. Apply general principles and methods of research in the field of health care, as well as modern methods and tools, digital technologies and specialised software for conducting research in the field of
dentistry.

RN07. Develop and implement scientific and/or innovative medical projects that make it possible to rethink existing knowledge and create new holistic knowledge and/or professional practice and solve significant problems in the field of medicine.

RN09. Plan and conduct research in dentistry and related interdisciplinary fields using modern tools and adhering to the norms of professional and academic ethics, bioethics, good clinical practice (GMP), critically analyse the results of one's own research and the results of other researchers in the context of the entire body of modern knowledge.

RN10. Develop and research models of processes and systems, effectively use them to obtain new knowledge and/or create innovative products in dentistry and related interdisciplinary fields.

As a result of studying the academic discipline, the student should:

Know:

- conceptual and methodological knowledge in the field or at the intersection of fields of knowledge or professional activity

Be able to:

- solve significant problems in the field of professional activity, science and/or innovation, expand and re-evaluate existing knowledge and professional practices;
- initiate, plan, implement and adjust a consistent process of thorough scientific research in compliance with proper academic integrity;
- critically analyse, evaluate and synthesise new and complex ideas.

Demonstrate:

- free communication on issues related to scientific and expert knowledge with colleagues, the wider scientific community and society as a whole.
- significant authority, innovation, a high degree of independence, academic and professional integrity, consistent commitment to the development of new ideas or processes in advanced contexts of professional and scientific activity;
- the ability for continuous self-development and self-improvement.

9. INFORMATION CONTENT OF THE ACADEMIC DISCIPLINE

MODULE 1. Systemic mechanisms of formation and correction of dentofacial anomalies

Content module 1. Morphofunctional and etiopathogenetic basis of the formation of dentofacial anomalies

Lecture topic 1. Evolution and development of the dentofacial apparatus at different stages of life. Analysis of modern classification systems for malocclusion and craniofacial deformities.

Practical class topic 1. Comprehensive morphofunctional characteristics of physiological occlusion at different stages of prenatal and postnatal development: normative models and variants of the norm.

Independent work topic 1. Comparative review of modern international classifications of dentofacial anomalies: conceptual approaches, criteria and controversial aspects.

Practical class topic 2. Etiopathogenesis of dentofacial anomalies: genetic, embryological, epigenetic and functional-ecological determinants.

Topic of independent work 2. Congenital craniofacial anomalies: modern models of pathogenesis, classification and principles of a multidisciplinary approach.

Practical class topic 3. Systemic analysis of modern orthodontic approaches: biomedical concepts, evidence-based intervention algorithms and prognostic modelling of treatment outcomes.

Independent work topic 3. Clinical biomechanics of orthodontic tooth movement: tissue reactions, cellular mechanisms and optimisation parameters.

Practical class topic 4. Prevention of dentofacial anomalies in children: evidence-based models of early detection, risk assessment and preventive interventions.

Independent work topic 4. Preventive strategies during the temporary, transitional and permanent occlusion periods: modern protocols, clinical effectiveness and prognostic value.

Lecture topic 2. Dental anomalies and defects of the dentition in childhood: mechanisms of formation, diagnostic strategies and principles of comprehensive rehabilitation.

Practical class topic 5. The relationship between respiratory disorders in children (OSA, mouth breathing) and the development of craniofacial deformities.

Topic of independent work 5. Modern requirements and technological features of the manufacture of removable and non-removable orthodontic structures in children.

Practical class topic 6. Traumatic injuries to teeth and jaws in children: modern concepts of pathogenesis, risk stratification and choice of orthodontic tactics.

Independent work topic 6. Scientifically based protocols for the treatment of dental and jaw injuries in children: analysis of international recommendations.

Practical class topic 7. Organisational models for providing orthodontic care: principles of evidence-based dentistry, standardisation and quality assessment of clinical services.

Independent work topic 7. Modern global strategies for the organisation of orthodontic care: comparative analysis, trends and prospects for implementation in Ukraine.

Practical class topic 8. Speech disorders in malocclusion: interdisciplinary approaches to diagnosis and scientifically based methods of correction.
Independent work topic 8. Principles of interprofessional interaction between orthodontists and speech therapists: evidence-based models of joint patient management.

MODULE 2. Clinical diagnosis, biomechanical rationale and age-related strategies for orthodontic correction of dentofacial anomalies
Content module 1. Clinical, diagnostic and biomechanical foundations of orthodontic correction at different ages
Lecture topic 1. Clinical examination of orthodontic patients: modern standards, analytical approaches and integration of additional diagnostic methods for dental and jaw anomalies and deformities.
Practical class topic 1. Diagnostics in orthodontics: clinical, instrumental and digital methods for assessing structural and functional status.
Independent work topic 1. Modern diagnostic technologies in orthodontics: analytical review of methods, accuracy and prognostic value.
Practical class topic 2. Age-related aspects of the clinic, diagnosis and treatment of anomalies of individual teeth: morphological, functional and biological determinants.
Independent work topic 2. Prevention of anomalies of individual teeth at different stages of development: modern strategies, risks and evidence-based approaches.
Practical class topic 3. Clinical, biomechanical and functional aspects of dental arch shape anomalies: diagnosis, treatment and prevention.
Independent work topic 3. Local disorders in anomalies of the dental arch: structural changes, functional imbalances and their clinical significance.
Practical class topic 4. Sagittal malocclusion: modern clinical models, biomechanical treatment strategies and evidence-based preventive approaches.
Independent study topic 4. Age-related features of sagittal anomaly treatment: methods, effectiveness and prognostic selection criteria.
Practical class topic 5. Vertical malocclusion: clinical treatment strategies and modern preventive approaches.
Independent work topic 5. Age-related aspects of vertical anomaly therapy: biomechanical solutions and clinical predictors of success.
Practical class topic 6. Transverse malocclusion: morphological characteristics, principles of correction and modern preventive treatment models.
Independent study topic 6. Age-related features of transverse anomaly treatment: adaptive strategies and prognostic approaches.
Practical class topic 7. Orthodontic treatment of adolescents and adults: stratification of clinical cases, interdisciplinary approaches and clinical management models.
Independent work topic 7. Methodology for conducting practical teaching classes in higher medical education: modern strategies, didactic tools and assessment.
Practical class topic 8. Hygiene management in patients with orthodontic appliances: risks, preventive protocols and individualised recommendations.
Independent work topic 8. Methods of organizing and conducting practical teaching classes in the training of third-level education seekers.

MODULE 3. Innovative biomechanical and digital technologies in modern orthodontics
Content module 1. Biomechanical principles and digital planning of innovative orthodontic interventions
Lecture topic 1. Modern strategies and biomechanical concepts for the treatment of dentofacial anomalies: evidence-based technologies and innovative approaches.
Practical session topic 1. Innovative appliances for upper jaw expansion: biomechanical principles, digital planning and clinical effectiveness.
Independent work topic 1. Comparative analysis of removable and non-removable appliances for transverse correction: indications, effectiveness and predictability of results.

Practical session topic 2. Clinical aspects of using orthodontic microimplants: anchorage, loading, biological tissue reactions.
Independent study topic 2. The concept of anchorage in modern orthodontics: classification, innovative solutions and prognostic parameters.
Practical class topic 3. Application of transparent aligner systems: digital modelling, biomechanics of movements and clinical algorithms for patient management.
Independent study topic 3. Comparative review of modern clear aligner systems: technological features, indications and clinical effectiveness.
Practical class topic 4. Lingual braces: specific biomechanical principles, digital customisation and clinical management tactics.
Independent work topic 4. Tools, materials and digital methods for working with lingual orthodontic systems.
Lecture topic 2. Digital diagnostics in orthodontics: modern protocols, analysis algorithms and integration of 3D/4D technologies.
Practical session topic 5. Principles of evidence-based orthodontic diagnostics: digital scanning, 3D analysis and comprehensive assessment of craniofacial structures.
Topic of independent work 5. Intraoral and extraoral scanners: scanning technologies, accuracy, limitations of use and digital workflow.
Practical class topic 6. Modern methods of fixing braces: adhesive protocols, digital positioning and accuracy control.
Independent study topic 6. Organisation of clinical orthodontic practice: process standardisation, patient management and quality indicators.
Practical class topic 7. Multi-arch archwire technique (MEAW): biomechanical principles, application protocols and indications in complex clinical cases.
Independent work topic 7. Methods of preparing and conducting practical teaching sessions in the training of PhD candidates.
Practical class topic 8. A comprehensive approach to orthodontic treatment: interdisciplinary interaction, 3D planning and personalised clinical strategies.
Independent work topic 8. Methodological approaches to organising and conducting practical teaching classes in higher medical education.

10. STRUCTURE OF THE ACADEMIC DISCIPLINE

No	Names of modules and topics	Number of hours			
		Total	Lectures	Practical classes	Independent work
MODULE 1. Systemic mechanisms of formation and correction of dentofacial anomalies Content module 1. Morphofunctional and etiopathogenetic basis of the formation of dentofacial anomalies					
1	**Lecture topic 1.** Evolution and development of the dentofacial apparatus at different stages of life. Analysis of modern classification systems for malocclusion and craniofacial deformities. **Practical class topic 1.** Comprehensive morphofunctional characteristics of physiological occlusion at different stages of prenatal and postnatal development: normative models and variants of the norm. **Independent work topic 1.** Comparative review of modern international classifications of dental and facial anomalies: conceptual approaches, criteria and controversial aspects.	18	4	4	10
2	**Practical class topic 2.** Etiopathogenesis of dentofacial anomalies: genetic, embryological, epigenetic, and functional-ecological determinants.	14	-	4	10

	Topic of independent work 2. Congenital craniofacial anomalies: modern models of pathogenesis, classification and principles of a multidisciplinary approach.				
3	**Practical class topic 3.** Systemic analysis of modern orthodontic approaches: biomedical concepts, evidence-based intervention algorithms and predictive modelling of treatment outcomes. **Topic of independent work 3.** Clinical biomechanics of orthodontic tooth movement: tissue reactions, cellular mechanisms and optimisation parameters.	14	-	4	10
4	**Practical training topic 4.** Prevention of dental and facial anomalies in children: evidence-based models for early detection, risk assessment and preventive interventions. **Topic of independent work 4.** Preventive strategies during the temporary, transitional and permanent occlusion periods: modern protocols, clinical effectiveness and prognostic value.	12	-	2	10
5	**Lecture topic 2.** Dental anomalies and defects of the dentition in childhood: mechanisms of formation, diagnostic strategies and principles of comprehensive rehabilitation. **Practical class topic 5.** The relationship between respiratory disorders in children (OSA, mouth breathing) and the development of craniofacial deformities. **Topic of independent work 5.** Modern requirements and technological features of manufacturing removable and non-removable orthodontic structures in children.	18	4	4	10
6	**Practical training topic 6.** Traumatic injuries to teeth and jaws in children: modern concepts of pathogenesis, risk stratification and choice of orthodontic tactics. **Topic of independent work 6.** Scientifically based protocols for the treatment of dental and jaw injuries in children: analysis of international recommendations.	14	-	4	10
7	**Practical training topic 7.** Organisational models for providing orthodontic care: principles of evidence-based dentistry, standardisation and quality assessment of clinical services. **Topic of independent work 7.** Modern global strategies for the organisation of orthodontic care: comparative analysis, trends and prospects for implementation in Ukraine.	16	-	2	14
8	**Practical lesson topic 8.** Speech disorders in malocclusion: interdisciplinary approaches to diagnosis and scientifically based correction methods. **Topic of independent work 8.** Principles of interprofessional interaction between orthodontists and speech therapists: evidence-based models of joint patient management.	14	-	2	12
Total		**120**	**8**	**26**	**86**
MODULE 2. Clinical diagnosis, biomechanical rationale and age-related strategies for orthodontic correction of dentofacial anomalies					

	Content module 1. Clinical, diagnostic and biomechanical foundations of orthodontic correction at different ages				
1	**Lecture topic 1.** Clinical examination of orthodontic patients: modern standards, analytical approaches and integration of additional diagnostic methods for dental and jaw anomalies and deformities. **Practical class topic 1.** Diagnostics in orthodontics: clinical, instrumental and digital methods for assessing structural and functional status. **Independent work topic 1**. Modern diagnostic technologies in orthodontics: analytical review of methods, accuracy and prognostic value.	19	4	4	11
2	**Practical training topic 2.** Age-related aspects of the clinic, diagnosis and treatment of anomalies of individual teeth: morphological, functional and biological determinants. **Topic of independent work 2.** Prevention of anomalies of individual teeth at different stages of development: modern strategies, risks and evidence-based approaches.	15	-	4	11
3	**Practical training topic 3.** Clinical, biomechanical and functional aspects of dental arch shape anomalies: diagnosis, treatment and prevention. **Topic of independent work 3.** Local disorders in dental arch shape anomalies: structural changes, functional imbalances and their clinical significance.	15	-	4	11
4	**Practical training topic 4.** Sagittal malocclusion: modern clinical models, biomechanical treatment strategies and evidence-based preventive approaches. **Topic of independent work 4.** Age-related features of sagittal anomaly treatment: methods, effectiveness and prognostic selection criteria.	13	-	2	11
5	**Practical training topic 5.** Vertical malocclusion: clinical treatment strategies and modern preventive approaches. **Topic of independent work 5.** Age aspects of vertical anomaly therapy: biomechanical solutions and clinical predictors of success.	15	-	4	11
6	**Practical training topic 6.** Transverse malocclusion: morphological characteristics, correction principles and modern preventive treatment models. **Topic of independent work 6.** Age-related features of treatment of transverse anomalies: adaptive strategies and prognostic approaches.	15	-	4	11
7	**Practical class topic 7.** Orthodontic treatment of adolescents and adults: stratification of clinical cases, interdisciplinary approaches and clinical management models. **Topic of independent work 7.** Methodology for conducting practical teaching classes in higher medical education: modern strategies, didactic tools and assessment.	15	-	4	11
8	**Practical lesson topic 8.** Hygiene management in patients with orthodontic	13	-	2	11

	appliances: risks, preventive protocols and individualised recommendations. **Topic of independent work 8.** Methods of organizing and conducting practical pedagogical classes in the training of third-level education seekers.				
Total		**120**	**4**	**28**	**88**
MODULE 3. Innovative biomechanical and digital technologies in modern orthodontics Content module 1. Biomechanical principles and digital planning of innovative orthodontic interventions					
1	**Lecture topic 1.** Modern strategies and biomechanical concepts for the treatment of dentofacial anomalies: evidence-based technologies and innovative approaches. **Practical session topic 1.** Innovative appliances for upper jaw expansion: biomechanical principles, digital planning and clinical effectiveness. **Independent work topic 1.** Comparative analysis of removable and non-removable appliances for transverse correction: indications, effectiveness and predictability of results.	17	4	3	10
2	**Practical training topic 2.** Clinical aspects of orthodontic microimplant use: anchorage, loading, biological tissue reactions. **Topic of independent work 2.** The concept of anchorage in modern orthodontics: classification, innovative solutions and prognostic parameters.	15	-	3	12
3	**Practical training topic 3.** Application of clear aligner systems: digital modelling, biomechanics of movements and clinical algorithms for patient management. **Topic of independent work 3.** Comparative review of modern clear aligner systems: technological features, indications and clinical effectiveness.	15	-	3	12
4	**Practical training topic 4.** Lingual braces: specific biomechanical principles, digital customisation and clinical management tactics. **Topic of independent work 4.** Tools, materials and digital methods for working with lingual orthodontic systems.	13	-	3	10
5	**Lecture topic 2.** Digital diagnostics in orthodontics: modern protocols, analysis algorithms and integration of 3D/4D technologies. **Practical class topic 5.** Principles of evidence-based orthodontic diagnostics: digital scanning, 3D analysis and comprehensive assessment of craniofacial structures. **Independent work topic 5.** Intraoral and extraoral scanners: scanning technologies, accuracy, limitations of use and digital workflow.	17	4	3	10
6	**Practical training topic 6.** Modern methods of fixing braces: adhesive protocols, digital positioning and accuracy control. **Topic of independent work 6.** Organisation of clinical orthodontic practice: process	15	-	5	10

	standardisation, patient management and quality indicators.				
7	**Practical class topic 7.** Multi-loop technique (MEAW): biomechanical principles, application protocols and indications in complex clinical cases. **Topic of independent work 7.** Methods of preparing and conducting practical pedagogical classes in the training of PhD candidates.	15	-	3	12
8	**Practical class topic 8.** A comprehensive approach to orthodontic treatment: interdisciplinary collaboration, 3D planning and personalised clinical strategies. **Topic of independent work 8.** Methodological approaches to the organisation and conduct of practical teaching sessions in higher medical education.	13	-	3	10
Total		**120**	**8**	**26**	**86**
Total		**360**	**20**	**80**	**260**

11. THEMATIC LECTURE PLAN

No No	Topic	Number hours
1	Evolution and development of the dentofacial apparatus at different stages of life. Analysis of modern classification systems for malocclusion and craniofacial deformities.	4
2	Dental anomalies and defects of the dentition in childhood: mechanisms of formation, diagnostic strategies and principles of comprehensive rehabilitation.	4
3	Clinical examination of orthodontic patients: modern standards, analytical approaches and integration of additional diagnostic methods for dental and jaw anomalies and deformities.	4
4	Modern strategies and biomechanical concepts for the treatment of dental and facial anomalies: evidence-based technologies and innovative approaches.	4
5	Digital diagnostics in orthodontics: modern protocols, analysis algorithms and integration of 3D/4D technologies.	4
TOTAL		**20**

12. THEMATIC PLAN OF PRACTICAL CLASSES

No No	Topic	Number hours
MODULE 1. Systemic mechanisms of formation and correction of dentofacial anomalies Content module 1. Morphofunctional and etiopathogenetic basis of the formation of dentofacial anomalies		
1	Comprehensive morphofunctional characteristics of physiological occlusion at different stages of postnatal development: normative models and variants of the norm.	4
2	Etiopathogenesis of dentofacial anomalies: genetic, embryological, epigenetic, and functional-ecological determinants.	4
3	Systemic analysis of modern orthodontic approaches: biomedical concepts, evidence-based intervention algorithms and prognostic modelling of treatment outcomes.	4
4	Prevention of dental and maxillofacial anomalies in children: evidence-based models of early detection, risk assessment and preventive interventions.	2

5	Modern requirements and technological features of manufacturing removable and non-removable orthodontic structures in children.	4
6	Traumatic injuries of teeth and jaws in children: modern concepts of pathogenesis, risk stratification and choice of therapeutic tactics.	4
7	Organisational models for providing orthodontic care: principles of evidence-based dentistry, standardisation and quality assessment of clinical services.	2
8	Speech disorders in malocclusion: interdisciplinary approaches to diagnosis and scientifically based methods of correction.	2
MODULE 2. Clinical diagnosis, biomechanical rationale and age-related strategies for orthodontic correction of dentofacial anomalies Content module 1. Clinical, diagnostic and biomechanical foundations of orthodontic correction at different ages		
9	Diagnostics in orthodontics: clinical, instrumental and digital methods of assessing the structural and functional state.	4
10	Age aspects of the clinic, diagnosis and treatment of anomalies of individual teeth: morphological, functional and biological determinants.	4
11	Clinical, biomechanical and functional aspects of dental arch shape anomalies: diagnosis, treatment and prevention.	4
12	Sagittal malocclusion: modern clinical models, biomechanical treatment strategies and evidence-based preventive approaches.	2
13	Vertical malocclusion: pathofunctional analysis, clinical treatment strategies and modern preventive approaches.	4
14	Transverse malocclusion: morphological characteristics, principles of correction and modern preventive models.	4
15	Orthodontic treatment of adolescents and adults: stratification of clinical cases, interdisciplinary approaches and clinical management models.	4
16	Hygiene management in patients with orthodontic appliances: risks, preventive protocols and individualised recommendations.	2
MODULE 3. Innovative biomechanical and digital technologies in modern orthodontics Content module 1. Biomechanical principles and digital planning of innovative orthodontic interventions		
17	Innovative appliances for upper jaw expansion: biomechanical principles, digital planning and clinical effectiveness.	3
18	Clinical aspects of the use of orthodontic microimplants: anchorage, loading, biological tissue reactions.	3
19	Application of transparent aligner systems: digital modelling, biomechanics of movements and clinical algorithms for patient management.	3
20	Lingual braces: specific biomechanical principles, digital customisation and clinical management tactics.	3
21	Principles of evidence-based orthodontic diagnostics: digital scanning, 3D analysis and comprehensive assessment of craniofacial structures.	3
22	Modern methods of fixing braces: adhesive protocols, digital positioning and accuracy control.	5
23	Multi-loop technique (MEAW): biomechanical principles, application protocols and indications in complex clinical cases.	3
24	A comprehensive approach to orthodontic treatment: interdisciplinary collaboration, 3D planning and personalised clinical strategies.	3
TOTAL		**8**

13. THEMATIC PLAN FOR INDEPENDENT WORK

No No	Topic	Number hours
1	Comprehensive morphofunctional characteristics of physiological occlusion at different stages of prenatal and postnatal development: normative models and variants of the norm.	**10**
2	Congenital craniofacial anomalies: modern models of pathogenesis, classification and principles of multidisciplinary management.	**10**
3	Clinical biomechanics of orthodontic tooth movement: tissue reactions, cellular mechanisms and optimisation parameters.	**10**
4	Preventive strategies during the temporary and mixed dentition period: modern protocols, clinical efficacy and prognostic value.	**10**
5	Current requirements and technological features of manufacturing removable and non-removable orthopaedic structures in children.	**10**
6	Scientifically based protocols for the treatment of dental and jaw injuries in children: analysis of international recommendations.	**10**
7	Modern global strategies for organising orthodontic care: comparative analysis, trends and prospects for implementation in Ukraine.	**14**
8	Principles of interprofessional interaction between orthodontists and speech therapists: evidence-based models of joint patient management.	**12**
9	Modern diagnostic technologies in orthodontics: an analytical review of methods, accuracy and prognostic value.	**11**
10	Prevention of anomalies of individual teeth at different stages of development: modern strategies, risks and evidence-based approaches.	**11**
11	Local disorders in anomalies of the dental arches: structural changes, functional imbalances and their clinical significance.	**11**
12	Age-related features of sagittal anomaly treatment: methods, effectiveness and prognostic selection criteria.	**11**
13	Age aspects of vertical anomaly therapy: biomechanical solutions and clinical predictors of success.	**11**
14	Age-related features of transverse anomaly treatment: adaptive strategies and prognostic approaches.	**11**
15	Methodology for conducting practical pedagogical classes in higher medical education: modern strategies, didactic tools and assessment.	**11**
16	Methods of organising and conducting practical pedagogical classes in the training of third-level education seekers.	**11**
17	Comparative analysis of removable and non-removable appliances for transverse correction: indications, effectiveness and predictability of results.	**10**
18	The concept of anchorage in modern orthodontics: classification, innovative solutions and prognostic parameters.	**12**
19	Comparative review of modern clear aligner systems: technological features, indications and clinical effectiveness.	**12**
20	Tools, materials and digital methods for working with lingual orthodontic systems.	**10**
21	Intraoral and extraoral scanners: scanning technologies, accuracy, limitations of use and digital workflow.	**10**
22	Organisation of clinical orthodontic practice: process standardisation, patient management and practice quality indicators.	**10**
23	Methods for preparing and conducting practical teaching sessions in the training of PhD candidates.	**12**
24	Methodological approaches to organising and conducting practical teaching classes in higher medical education.	**10**
TOTAL		**260**

14. LIST OF INDIVIDUAL TASKS

Not provided

15. TASKS FOR INDEPENDENT WORK

Determined by the teacher individually for each applicant in accordance with the topic and purpose of their scientific research.

16. METHODS AND FORMS OF ASSESSMENT

16.1. Form, procedure, methodology and criteria for assessing current academic performance.

Ongoing assessment includes oral questioning, analysis of clinical cases, completion of practical tasks and work in a clinical setting under the supervision of a research supervisor.

Methods of ongoing assessment:

- *traditional questioning* — the teacher asks the candidates questions orally, which allows them to assess the level of knowledge and communication skills;
- *"chain questioning" method* — one student answers, the next one adds to the answer.

Criteria for assessing the ongoing assessment of applicants' knowledge and skills during the study of the module

25 points (*excellent*) The applicant demonstrates in-depth, systematic knowledge, complete mastery of the material, modern research methods and scientific approaches. Responds confidently and reasonably, demonstrates a high level of competence and independence, is able to apply knowledge in new conditions, has their own scientific ideas.

20 points (*good*). The applicant has sufficient knowledge to understand and apply the material, although minor inaccuracies are possible. Practical skills are at an average level, answers are generally correct but not always complete, independence in practical situations is limited.

15 points (*satisfactory*). Knowledge is fragmentary, with significant gaps in theory or methods. Practical tasks are performed with prompts, the applicant demonstrates a superficial understanding, requires constant supervision and correction.

0 points (*unsatisfactory*). Knowledge is insufficient, the applicant does not possess basic concepts and skills. Practical tasks are performed incorrectly or not performed at all. The minimum level of competence is absent, re-study of the material and additional control are necessary.

Monitoring the completion of independent work. Independent work involves performing various types of tasks aimed at acquiring new knowledge, systematising and generalising it, forming practical skills and abilities, and monitoring the applicant's readiness for practical classes and tests.

16.2. Form, procedure, methodology and criteria for assessing individual independent work.

Not provided for in the programme

16.3. Conditions for admission to the final assessment.

The final assessment (test) is carried out after the completion of all topics of the module during the last class of the module.

Applicants who have completed all types of work provided for in the curriculum and have scored at least the minimum number of points (120 points) are admitted to the test.

16.4. Form, procedure, methodology and criteria for assessment during the final assessment.

At the last thematic class on the subject, after the topic has been covered, the teacher of the study group announces the number of points that the student has scored as a result of the current assessment.

The results of the test are assessed on a two-point scale: "pass" or "fail".

The student receives a "pass" grade if he or she has completed all types of work specified in the working curriculum for the discipline, attended all training sessions (lectures, practical classes) specified in the thematic plan for the discipline (if there are any absences, they have been made up in a timely manner), and has earned a total of at least 120 points in the study of the academic discipline.

The applicant receives a "*fail*" grade if they have missed classes (seminars and lectures) and the number of points for current control is less than the minimum.

17. LIST OF QUESTIONS FOR THE FINAL ASSESSMENT

Not provided

18. SCHEME FOR CALCULATING AND DISTRIBUTING POINTS

The grade for an academic discipline is determined as the sum of the grades for current academic activity (in points) awarded at each seminar on the relevant topic and the number of points for the completion of individual assignments by the student.

The maximum number of points that a student can earn while studying the discipline is 200 points, including:

- for current academic activity – 200 points;

The minimum number of points that a student can earn while studying a discipline is 120 points, including:

- for current academic activity – 120 points;

For ongoing assessment, the following system is used to convert the traditional assessment system into points:

Module number, number of teaching hours/number of ECTS credits	Number of content modules, their numbers	Number of practical classes	Conversion of traditional assessments into points					Minimum number of points
			Traditional grades				Points for completing an individual assignment	
			"5"	**"4"**	**"3"**	**"2"**		
Module 1 120/4	1 No.	8	25	20	15	0	0	120
Module 2 120/4	1 No.	8	25	20	15	0	0	120
Module 3 120/4	1 No.	8	25	20	15	0	0	120

The maximum number of points a student can earn while studying the module is 200.

It is calculated by multiplying the number of points corresponding to a grade of "5" by the number of topics in the module: 25 x 8 = 200

The minimum number of points that a student can earn when studying the module is calculated by multiplying the number of points corresponding to a grade of "3" by the number of topics in the module: 15x8=120.

When assessing the mastery of each topic, applicants are graded on a four-point (traditional) scale and on a 200-point scale using the accepted and approved assessment criteria for the academic discipline.

Applicants who study at the same faculty, course, and speciality are ranked on the ***ECTS*** scale based on the number of points earned in the discipline as follows:

***ECTS* grade**	**Statistical indicator**
"A"	Top 10% of applicants
“B”	Next 25% of applicants

“C”	Next 30% of applicants
“D”	The next 25% of applicants
“E”	The last 10% of applicants

Ranking with grades "A", "B", "C", "D", "E" is carried out by the Doctoral and Postgraduate Department for applicants who study in one speciality and have successfully completed the discipline.

The grade "FX" is given to applicants who have earned the minimum number of points for their current academic performance but have not received a passing grade. This category of applicants has the right to retake the exam.

The grade "F" is given to students who have attended all classroom sessions for the discipline but have not earned the minimum number of points for their current academic performance. This category of students has the right to retake the discipline.

19. RECOMMENDED READING

19.1. Main (basic)* literature:

1. Godovanets OI. Age-related features of the human dentition. Chernivtsi: BDMU; 2011. 120 p.
2. Kuroedova VD, Dmitrenko MI. Makarova OM, Stasyuk OA. Orthodontics explained in questions and answers with illustrations. Lviv: GalDent; 2016. 84 p.
3. Kuroedova VD, Karasyunok AE. The role of parents in orthodontic treatment of children. Lviv: GalDent; 2016. 76 p.
4. Makarova O.M., Kuroedova V.D. Features of the diagnosis of sagittal bite asymmetries. Lviv: GalDent; 2016. 80 p.
5. Evidence-based clinical guidelines "Orthodontics and maxillofacial orthopaedics" (https://www.dec.gov.ua/wp-content/uploads/2023/04/2023_620_kn-ortodontiya.pdf)
6. Medical care standard "Malocclusion (mesial occlusion, open bite, deep bite)" (https://moz.gov.ua/uk/decrees/nakaz-moz-ukrayini-vid-03-03-2025-360-pro-zatverdzhennya-standartu-medichnoyi-dopomogi-anomaliyi-prikusu-mezialna-oklyuziya-vidkritij-prikus-glibokij-prikus)
7. Medical care standard "Distal occlusion" (https://zakon.rada.gov.ua/rada/show/v0620282-23#Text)

19.2 Additional literature:

1. Aliakbar B. Early-age orthodontic treatment. Quintessence Publishing Co; 2013.
2. Araújo EA, Buschang PH. Recognising and Correcting Developing Malocclusions: A Problem-Oriented Approach to Orthodontics. 2nd ed. Hoboken: Wiley; 2024.
3. Brent E. Larson, William R. Proffit, Henry W. Fields, David M. Sarver. Contemporary Orthodontics, 6th Edition; 2018.
4. Brugnami F, Caiazzo A, Meuli S. Orthodontically Driven Osteogenesis. 2nd ed. Hoboken: Wiley; 2024.
5. Cobourne MT, DiBiase AT. Handbook of Orthodontics. 3rd ed. Philadelphia: Elsevier; 2024.
6. Cobourne MT. Handbook of Orthodontics. 3rd ed. London: Elsevier; 2025. 650 p.
7. Eliades T, Katsaros C. Debonding and Fixed Retention in Orthodontics: An Evidence-Based Clinical Guide. Hoboken: Wiley; 2023.
8. English JD, ed. Mosby’s Orthodontic Review. 2nd ed. St. Louis: Elsevier; 2025.
9. Graber LW, Vig KWL, Huang GJ, Fleming PS. Orthodontics: Current Principles and Techniques. 7th ed. St. Louis: Elsevier; 2025.
10. Karad A. Clinical Orthodontics. Current Concepts Goals and Mechanics. 2nd ed. India: Elsevier; 2019. 540 p.

11. Krishnan V, Kuijpers-Jagtman AM. Integrated Clinical Orthodontics. 2nd ed. Hoboken: Wiley; 2023.
12. Long H, Han X, Lai W. Clinical Insertion Techniques of Orthodontic Temporary Anchorage Devices. Hoboken: Wiley; 2023.
13. Melsen B, Athanasiou AE. Dentofacial and Occlusal Asymmetries. Hoboken: Wiley; 2024.
14. Nanda R, ed. Atlas of Aligner Treatment and Planning. St. Louis: Elsevier; 2025.
15. Proffit WR, Fields HW, Larson BE, Sarver DM. Contemporary Orthodontics. 6th ed. St. Louis: Elsevier; 2019. 744 p.
16. Nanda R. Biomechanics and Esthetic Strategies in Clinical Orthodontics. 2nd ed. St. Louis: Elsevier Saunders; 2016. 400 p.
17. Okeson JP. Management of Temporomandibular Disorders and Occlusion. 8th ed. St. Louis, Missouri: Elsevier; 2020.
18. Tamimi D, Hatcher DC. Specialty Imaging: Temporomandibular Joint. Salt Lake City (UT): Amirsys; 2016.
19. Sario AUH. Orthodontics in 2025: Evidence Based Clinical Practice. 1st ed. Hamburg: Tredition; 2025. 228 p. booktopia.com.au+1
20. Romano R (ed). Orthodontic Mindset: The secrets behind successful orthodontic treatment. 1st ed. London: Quintessence Publishing; 2025. 200 p.

19.3 Information resources:

1. Website of the Department of Paediatric Dentistry https://sites.google.com/bsmu.edu.ua/childrens-dentistry-department
2. Website of the Doctoral and Postgraduate Department https://dako.bsmu.edu.ua/
3. Scopus database https://www.scopus.com/home.uri?zone=header&origin=
4. Web of Science database https://access.clarivate.com/login?app=wos&alternative=true&shibShireURL=https:%2F%2Fwww.webofknowledge.com%2F%3Fauth%3DShibboleth&shibReturnURL=https:%2F%2Fwww.webofknowledge.com%2F&roaming=true
5. Scientific periodicals of Ukraine https://journals.uran.ua/
6. Ukrainian Association of Orthodontists (UAO) (https://aou.com.ua/)
7. American Association of Orthodontists (AAO Annual Session) (https://aaoinfo.org/)
8. European Orthodontic Society (EOS Congress) (https://eoseurope.org/)
9. World Federation of Orthodontists (WFO World Congress) (https://www.wfo.org/)
10. British Orthodontic Conference (BOC) (https://bos.org.uk/boc2025/)
11. Asia-Pacific Orthodontic Conference (APOC) (https://aoscongress.com/)

20. SYLLABUS COMPILERS

1. Oksana GODOVANETS – Doctor of Medical Sciences, Professor, Professor at the Department of Paediatric Dentistry.
2. Anastasia KOTELBAN – Candidate of Medical Sciences, Associate Professor, Associate Professor of the Department of Paediatric Dentistry.
3. Lyudmila GRINKEVICH – Doctor of Philosophy, Assistant at the Department of Paediatric Dentistry.