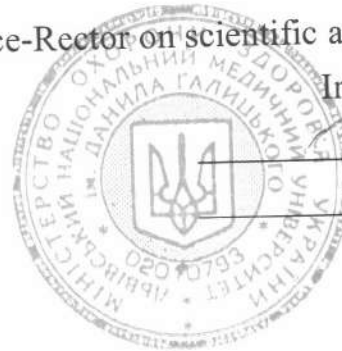


Danylo Halytsky Lviv National Medical University
Department of Orthodontics

APPROVED

First Vice-Rector on scientific and pedagogical work

Iryna SOLONYNKO



Iryna Solonyenko

12.07. 2022

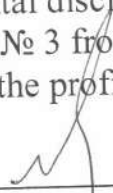
Working curriculum on Orthodontics
4th year of studying
Training of specialists of the second (master's) level of higher education
Areas of Knowledge 22 Health Care
Specialties 221 "Dentistry"

Discussed and approved
at the session of the department
of Orthodontics
protocol № 12 from 15 June 2022
Head of the Department of Orthodontics



Professor Natalia CHUKHRAY

Approved
by the profile methodical commission
from dental disciplines
protocol № 3 from 21 June 2022
Head of the profile methodical commission



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INTRODUCTION

Program of studying the discipline "Orthodontics"

In accordance with the Standard of Higher Education of the second (master's) level

Knowledge 22 «Health»

Specialties 221 "Dentistry"

Master's Degree Program in Dentistry

Description of the discipline (abstract) Orthodontics (diagnosis of dental anomalies and deformations) is an educational discipline that allows students to become familiar with the definition of "Orthodontics" as an object, to acquire knowledge about the norm and pathology in orthodontics. To study the concept of dental anomalies and anomalies (anomalies of teeth, dentition, bite), peculiarities of antenatal and postnatal periods of development and formation of teeth, jaws and human face, as well as the health of the future mother and the child, affecting these processes, various negative factors that can lead to the emergence and development of abnormalities and deformities of the dentoalveolar apparatus. Students get acquainted with the peculiarities of the clinical examination of the orthodontic patient, the basic and additional methods of diagnosis, methods of treatment and the classification of orthodontic equipment.

| Structure of academic discipline | Number of hours | | | Ind. | Year of study, semester | Types of control |
|--|-------------------------|----------|-------------------|------|-------------------------|------------------|
| | Total | Audience | | | | |
| | | Lectures | Practical classes | | | |
| Course name: Orthodontics Content modules 3 | 3,5 credits / 105 hours | 10 | 40 | 55 | 4 course (VII semester) | exam |

The subject of studying the discipline "Orthodontics" is:

- Definition of the subject of orthodontics, norm and pathology in orthodontics, the concept of dento-jaw abnormalities and deformations.
- Embryogenesis, risk factors during pregnancy.
- Features of the formation of milk, mixed and permanent bite, risk factors in these periods, methods for eliminating them.
- Features of clinical examination of an orthodontic patient, basic and additional methods of examination.
- The role of oral cavity pathology in the development of dentoalveolar abnormalities and deformations. Implications for prosthetics in children. Risk factors that require surgical interventions.
- Anatomical and physiological features of chewing and mimic muscles. Musculoskeletal disorders as a risk factor for development of dentoalveolar anomalies and deformations, major complexes of myogymnastic exercises.
- Methods of treatment of orthodontic patients, classification of orthodontic appliances, its characteristics, influence on periodontal tissues.

Interdisciplinary connections

"Orthodontics" as a discipline

- a) is based on the students' previous study of human anatomy, histology, embryology and cytology, medical biology, medical chemistry, biological and bioorganic chemistry, physiological and pathological physiology, and medical physics and integrates with these disciplines;
- b) provides the basis for students studying such clinical disciplines as orthodontics, prevention of dental diseases, pediatric therapeutic dentistry, surgical dentistry;
- c) is based on the students' study of propedeutics of orthopedic dentistry and integrates with this discipline;
- d) forms the idea to prevent dental anomalies and deformities.

1. Purpose and tasks of the discipline

1.1. The purpose of teaching the discipline "**Orthodontics**" (**diagnosis of dentoalveolar anomalies and deformations**) is to study the stages of the formation of the dentoalveolar system in children, risk factors that lead to the development of abnormalities and methods for eliminating them, mastering the basic and complementary methods of diagnosis in orthodontics, early detection of oral cavity pathology, which requires orthopedic surgery, familiarization with the basic methods of treatment of orthodontic patients, the classification of orthodontic equipment, for the possibility of their subsequent application during clinical reception of patients and formation of special (professional) competences in the clinic of orthodontics.

1.2. The main tasks of studying the discipline "**Orthodontics**" are:

- Students study the features of the formation of the dentoalveolar system in children, the main risk factors for the development of anomalies and deformations, methods for their prevention and elimination;
- preparation of students for work in a clinical dentist's office by studying the basic and additional methods of examination of an orthodontic patient;
- mastering on the phantoms of the basic methods of treatment used in orthodontics.

1.3. Competence and learning outcomes, the formation of which is facilitated by discipline (the relationship with the normative content of the training of higher education graduates, formulated in terms of learning outcomes in the Standards of Higher Education).

In accordance with the requirements of the Standard of Higher Education, discipline ensures students' acquisition of competences: the relationship with the normative content of the training of higher education graduates, formulated in terms of the results of training in the Standard).

- **Integral:**

Ability to solve problems and problems in the field of health care in the specialty "Dentistry" in the professional activity or in the process of study, which involves research and / or innovation, and is characterized by uncertainty of conditions and requirements.

- **General:**

1. Ability to think and analyze abilities; the ability to learn and possess modern information and communication technologies.
2. Ability and understanding of subject area and profession.
3. Ability to apply knowledge in practical situations.
4. Ability to communicate in the state language and the second (foreign) language.
5. Ability to search, process and analyze information from various sources in Ukrainian and foreign languages.
6. Ability to adapt and act in a new situation.
7. Ability to work autonomously, to identify skills and to put and solve problems.
8. Ability to choose a communication strategy.
9. Ability to work in a team.
10. Skills for cooperation with colleagues and patients.
11. Ability to act on ethical grounds.
12. Skills for safe conduct.
13. Ability to assess and ensure the quality of the work performed.

- **Special (professional, subject):**

1. To recognize the moral and ethical and professional rules of the activity of the orthodontist doctor.
2. To understand moral and deontological principles of a medical specialist and rules of professional subordination in the clinic of dentistry.
3. Learn to promote a healthy psychological microclimate in a team, to learn the basics of legal norms of relations between the doctor-orthodontist → patient (child).
4. Know the different classifications of dentoalveolar anomalies and deformities:
 - to study the classification of Engle;
 - to study the Kalvelis classification;
 - to study the Betelman classification
- study the six keys of occlusion according to Andrews;

5. To acquire basic knowledge about classification of anomalies of individual teeth, anomalies of the number, sizes and eruption of teeth, anomalies of position of teeth, anomalies of dental arches, types of diastema:

- to study the main etiological factors of risk of anomalies development;
- to study methods of prevention;
- to know the basic and additional methods of diagnostics;
- to study the basic clinical signs of anomalies;
- to study complex methods of treatment;

6. To acquire basic knowledge about sagittal bite anomalies:

- to study the main etiological factors of risk of anomalies development;
- to study methods of prevention;
- to know the basic and additional methods of diagnostics;
- to study the basic clinical signs of anomalies;
- to study complex methods of treatment;

7. To acquire basic knowledge of vertical bite anomalies:

- to study the main etiological factors of risk of anomalies development;
- to study methods of prevention;
- to know the basic and additional methods of diagnostics;
- to study the basic clinical signs of anomalies;
- to study complex methods of treatment;

8. To acquire basic knowledge of transversal bite anomalies:

- to study the main etiological factors of risk of anomalies development;
- to study methods of prevention;
- to know the basic and additional methods of diagnostics;
- to study the basic clinical signs of anomalies;
- to study complex methods of treatment;

9. To acquire basic knowledge of completing medical history of an orthodontic patient.

Detail of competencies according to the descriptors of the NRC in the form of "Matrix of competencies".

Matrix of competencies

| № | Competence | Knowledge | Ability | Communication | Autonomy and responsibility |
|---------------------------|---|--|--|--|--|
| General competence | | | | | |
| 1 | Ability to think and analyze abilities; the ability to learn and possess modern information and communication technologies. | Know the current trends in the industry and indicators that characterize them. | Be able to conduct an analysis of professional information, make informed decisions, acquire modern knowledge. | Establish appropriate links to achieve goals. | Be responsible for timely acquisition of knowledge. |
| 2 | Ability and understanding of subject area and profession. | To know the peculiarities of the professional activity of a dentist. | Be able to carry out professional activities that require updating and integration of knowledge. | To form a communication strategy in professional activity. | Be responsible for continuous development with a high level of autonomy. |
| 3 | Ability to apply knowledge in practical situations. | Know the methods of realizing knowledge in solving practical problems. | Be able to use professional knowledge to solve practical problems. | Establish connections with actors of practical activity. | Be responsible for the reasonableness of the decisions taken. |
| 4 | Ability to communicate in | Know the state language, | Be able to use the state language and | To form a communication | Be responsible for continuing |

| | | | | | |
|----|---|---|--|---|---|
| | the state language and the second (foreign) language. | including professional orientation. Have a foreign language at a level sufficient for professional communication. | foreign language for professional activity and communication. | strategy in professional activity. | professional development with a high level of autonomy. |
| 5 | Ability to search, process and analyze information from various sources in Ukrainian and foreign languages. | To have the necessary knowledge in the field of information technologies applied in professional activity in Ukrainian and foreign languages. | Being able to use information technology in the professional field to search, process and analyze new information from different sources and in different languages. | Use information technology in professional activities. | To be responsible for the continuous development of professional knowledge and skills in Ukrainian and foreign languages. |
| 6 | Ability to adapt and act in a new situation. | Know the methods of realizing knowledge in solving practical problems. | Be able to use professional knowledge for adaptation and action in a new situation. | Establish connections with actors of practical activity. | Be responsible for the quality of performing professional tasks in a new situation. |
| 7 | Ability to work autonomously, to identify skills and to put and solve problems. | Know the methods of realizing knowledge in identifying, staging and solving problems of professional activity. | Be able to use professional knowledge to identify, articulate and solve professional problems. | To establish contacts with the subjects of practical activity with the purpose of revealing, setting and solving problems of professional activity. | To be responsible for the reasonableness of the decisions made to solve problems of professional activity. |
| 8 | Ability to choose a communication strategy. | Know the methods of realizing knowledge in choosing a strategy for communicating with patients and colleagues. | Be able to use knowledge to choose a strategy for communicating with patients and colleagues. | To form a communication strategy in professional activity. | Be responsible for continuing professional development with a high level of autonomy. |
| 9 | Ability to work in a team. | Know how to collaborate on teamwork. | Be able to use knowledge to choose a communication strategy during teamwork. | To form a communication strategy in professional activity. | To be responsible for continuous professional development. |
| 10 | Collaboration skills with colleagues and patients. | Know how to interact with colleagues and patients. | Be able to use knowledge to choose a communication strategy during teamwork. | To form a communication strategy in professional activity. | Be responsible for continuing professional development with a high level of autonomy. |
| 11 | Ability to act on ethical grounds. | Know the moral and ethical principles of a | To use in practice the moral and ethical principles | Observe during the professional activity the moral | Have personal responsibility for complying with |

| | | | | | |
|-------------------------------------|---|--|--|--|--|
| | | medical specialist and the rules of professional subordination. | of a medical specialist and the rules of professional subordination. | and ethical principles of the medical specialist and the rules of professional subordination. | the moral and ethical principles of the medical specialist and the rules of professional subordination. |
| 12 | Skills for safe conduct. | Ability to assess the level of danger in the performance of professional tasks. | Be able to carry out professional activities in compliance with safety rules. | Ensure high-quality performance of professional work in compliance with safety rules. | To be personally responsible for complying with safety rules when performing professional tasks. |
| 13 | Ability to evaluate and ensure the quality of work performed. | Ability to evaluate and provide quality when performing professional tasks. | Know the methods of evaluating performance indicators. | Be able to provide high-quality professional work. | Establish connections |
| Special (professional competencies) | | | | | |
| 1 | To recognize the moral and ethical and professional rules of the orthodontist doctor. | Know the basic provisions of the ethical code of a dentist | Use in practice Ethical Code of Dentist | Observe when communicating with patients and colleagues provisions Ethic The code of the dentist | Should be personally responsible for observing the provisions of the practice Ethical code of a dentist |
| 2 | To understand the moral and deontological principles of a medical specialist and rules of professional subordination in the clinic of dentistry. | Know the moral and deontological principles of a medical specialist and the rules of professional subordination in the clinic of dentistry and in working with children. | To use in practice the moral-deontological principles of a medical specialist and the rules of professional subordination in the clinic of dentistry and in working with children. | To observe during the professional activity the moral-deontological principles of a medical specialist and rules of professional subordination in the clinic of dentistry and in work with children. | Have personal responsibility for observing moral and deontological principles of the medical specialist and the rules of professional subordination in the clinic of dentistry and in working with children. |
| 3 | Learn to promote a healthy psychological microclimate in a team, to learn the basics of legal norms of relationships between the doctor-orthodontist → patient (child). | Know the valid legal norms of the relationship "doctor-dentist - orthodontist → patient (child)". | To use in practice the legal norms of the relationship "doctor - dentist orthodontist → patient (child)". Be able to form a healthy psychological microclimate in a team. | To observe during professional activity current ones legal norms of the relationship "doctor - dentist orthodontist → patient (child)". Support a healthy psychological microclimate in a team. | To bear personal responsibility for observance of the current legal norms of relations "doctor-dentist - orthodontist → patient (child)". |
| 4 | To know the | To know the | To be able to | Interact with the | Have personal |

| | | | | | |
|---|---|---|---|---|---|
| | <p>different classifications of dentoalveolar anomalies and deformities:</p> <ul style="list-style-type: none"> - to study the classification of Engle; - to study the Kalvelis classification; - study the six keys of occlusion according to Andrews; | <p>different classifications of dentoalveolar anomalies and deformities, types of physiological occlusion, signs of orthognatic occlusion.</p> | <p>characterize the dentoalveolar anomalies and deformities, types of physiological occlusion, signs of orthognatic occlusion.</p> | <p>patient (the child) and parents for a detailed history collection, examination and identification dentoalveolar anomalies and deformities.</p> | <p>responsibility for the correctness of collecting the history, conducting the examination and identifying the dentoalveolar anomalies and deformities.</p> |
| 5 | <p>To acquire basic knowledge about classification of anomalies of individual teeth, anomalies of number, sizes and eruption of teeth, anomalies of position of teeth, anomalies of dental series, types of diastema: - to study the main etiological factors of risk of anomalies development; - to study methods of prevention; - to know the basic and additional methods of diagnostics; - to study the basic clinical signs of anomalies; - to study complex methods of treatment;</p> | <p>Know the classification of anomalies of individual teeth, anomalies of number, sizes and eruption of teeth, anomalies of position of teeth, anomalies of dental series, types of diastema: - the main etiological factors of risk of anomalies development; methods of prevention; - to know the basic and additional methods of diagnostics; basic clinical signs of anomalies;</p> | <p>To be able to conduct an examination of the orthodontic patient, anthropometric, functional methods of examination, to check the dentoalveolar anomalies and deformities; prescribe the complex methods of treatment and prevention;</p> | <p>Understand the importance of conducting basic and additional survey methods to establish the correct diagnosis, followed by the preparation of a treatment plan.</p> | <p>Have personal responsibility for the correctness of the stages of the examination of the orthodontic patient and the implementation of additional methods of examination.</p> |
| 6 | <p>To acquire basic knowledge of sagittal, vertical and transversal bite anomalies:</p> <ul style="list-style-type: none"> - to study the main etiological factors of risk of anomalies development; - to study methods of prevention; - to know the basic and additional methods | <p>To know the classification of sagittal, vertical and transversal bite anomalies:</p> <ul style="list-style-type: none"> - the main etiological factors of risk of anomalies development; methods of prevention; - to know the basic and additional methods | <p>Be able to characterize the basic principles and methods of treating patients with dentoalveolar anomalies and deformations;</p> | <p>To realize the importance of knowledge of the basic principles and methods of treating patients with dental anomalies and deformations.</p> | <p>To have personal responsibility for knowledge possession at an adequate level in relation to the basic principles and methods of treating patients with dental anomalies and deformations.</p> |

| | | | | | |
|---|--|--|--|---|--|
| | of diagnostics; - to study the basic clinical signs of anomalies; - to study complex methods of treatment; | of diagnostics; to know the basic clinical signs of anomalies; - complex methods of treatment; | | | |
| 7 | Master the basic knowledge of completing the case history of an orthodontic patient. | To know the parts of history of an orthodontic patient. | To be able to collect anamnesis, to carry out basic and additional methods of diagnostics, to establish the diagnosis, to make the plan of treatment and prophylaxis, to write down all necessary sections of the medical history. | Understand the importance and necessity of proper management and completion of medical records. | Take personal responsibility for completing the story correctly. |

Learning outcomes:

Integrative end programmatic learning outcomes facilitated by Orthodontics:

1. Demonstrate moral and ethical and professional rules of activity of the doctor-orthodontist.
2. Know the different classifications of dentition anomalies and deformities:
 - the Engle classification;
 - Kalvelis classification;
 - Six occlusion keys according to Andrews;
 - Betelman classification
3. Demonstrate knowledge of the classification of anomalies of individual teeth, anomalies of the number, size and eruption of teeth, anomalies of tooth position, anomalies of dental rows, types of diastema:
 - to know the main etiological factors of risk of anomalies development;
 - methods of prevention;
 - basic and additional methods of diagnostics;
 - the main clinical signs of anomalies;
 - complex methods of treatment;
4. Have knowledge of sagittal, vertical and transversal bite anomalies:
 - the main etiological factors of risk of anomalies development;
 - methods of prevention;
 - basic and additional methods of diagnostics;
 - the main clinical signs of anomalies;
 - complex methods of treatment;
5. Have knowledge of completing the case history of an orthodontic patient.

Learning outcomes for the discipline:

As a result of studying the discipline "Orthodontics" (diagnosis of dental anomalies and deformities) the student should know:

1. Know the classification of anomalies of individual teeth.
2. To conduct an examination of an orthodontic patient:
 - with anomalies of the size of individual teeth;
 - with anomalies of the shape of individual teeth;
 - with anomalies of the number of individual teeth;
 - with diastema and tremas;
 - with a crowding of teeth;
 - with tortoanomaly;

- with vestibulo-oral position of the teeth.
3. To analyze the prevalence and intensity of anomalies of individual teeth and the position of individual teeth and to determine the factors that influence these indices.
 4. To analyze the results of the examination of the orthodontic patient:
 - with anomalies of the size of individual teeth;
 - with anomalies of the shape of individual teeth;
 - with anomalies of the number of individual teeth;
 - with diastema and tremas;
 - with teeth crowding;
 - with tortoanomaly;
 - with vestibulo-oral position of the teeth.
 5. To justify and formulate a preliminary clinical diagnosis:
 - with anomalies of the size of individual teeth;
 - with anomalies of the shape of individual teeth;
 - with anomalies of the number of individual teeth;
 - with diastema and tremas;
 - with teeth crowding;
 - with tortoanomaly;
 - with vestibulo-oral position of the teeth.
 6. To carry out differential diagnostics of diseases:
 - with anomalies of the size of individual teeth;
 - with anomalies of the shape of individual teeth;
 - with anomalies of the number of individual teeth;
 - with diastema and tremas;
 - with teeth crowding;
 - with tortoanomaly;
 - with vestibulo-oral position of the teeth.
 7. Determine the changed tooth color.
 8. To conduct an examination of an orthodontic patient with anomalies of the shape of the dentition:
 - Expansion of dental arches
 - Narrowing of dental arches
 - Dental alveolar lengthening
 - Tooth-alveolar shortening
 - Crowding of teeth
 - Protrusion (protraction) of dental arches
 - Retraction (retrusion) of dental arches
 9. To carry out examination of an orthodontic patient with anomalies and malocclusion:
 - distal forms of occlusion;
 - mesial forms of occlusion;
 - open bite;
 - deep bite;
 - single or double-sided crossbite.
 9. To analyze the results of examination of an orthodontic patient:
 - distal forms of occlusion;
 - mesial forms of occlusion;
 - open bite;
 - deep bite;
 - single or double-sided crossbite.
 10. Know the classification of pathology of the bite.
 11. To know current ideas about the etiology and pathogenesis of bite anomalies.
 12. Know the patterns of clinical manifestations of various pathological bites, depending on class and shape.
 13. To substantiate and formulate a preliminary clinical diagnosis:
 - distal forms of occlusion;
 - mesial forms of occlusion;
 - open bite;
 - deep bite;
 - crossbite.

14. Carry out differential diagnosis of bite anomalies: - with distal forms of occlusion;
 - with mesial forms of occlusion;
 - open bite;
 - cross bite

As a result of studying the discipline "Orthodontics" the student should be able to:

- Analyze the results of the examination of a patient with dental anomalies and deformities
- Identify dispensary groups for the supervision of orthodontic patients and carry out preventive measures in the group with risk factors
- Identify leading syndromes and symptoms in an orthodontic clinic
- Demonstrate mastery of morally-deontological principles of a medical specialist and principles of professional subordination at an orthodontic appointment
- To substantiate and formulate a preliminary clinical diagnosis of dental malignancies and deformities
- To substantiate and formulate a syndromic orthodontic diagnosis
- To carry out differential diagnostics of diseases in orthodontics
- Carry out differential diagnosis of somatic diseases that require special tactics of patient management in childhood
- Examine orthodontic patients
- Conduct primary and secondary prevention

2. Information volume of educational discipline

3,5 credits are allocated for studying the academic discipline - 105 hours.

Structure of the discipline "**Orthodontics**" (diagnosis of dental anomalies and deformations)

Thematic module 1: Dental anomalies and deformities.

3. Structure of the discipline

| Theme | Lectures | Practical classes | Independent work | Individual work |
|---|----------|-------------------|------------------|-----------------|
| <i>I semester Thematic module I.</i> | | | | |
| Theme 1. Classification of dentoalveolar anomalies and deformations (Engle, Kalvelis, Betelman). Six keys of occlusion for Andrews. | | 2 | 4 | - |
| Theme 2. Anomalies of teeth. Anomalies of the number, size, structure and teeth eruption. | 2 | 2 | 3 | |
| Theme 3. Anomalies of the position of individual teeth. Treatment of anomalies of the position of individual teeth. Types of diastems. Retention. Methods of treatment | 2 | 2 | 4 | |
| Theme 4. Anomalies and deformation of dental arches. | | 2 | 3 | |
| Theme 5. Sagittal anomalies of bite. Distal bite. Etiology, pathogenesis, prophylaxis. | 2 | 2 | 4 | |
| Theme 6. Clinic and diagnosis of distal bite. Dentoalveolar and gnathic form. Differential diagnosis of distal bite. | | 2 | 3 | |
| Theme 7. Comprehensive treatment of distal bite in different periods of dentition formation (milk, mixed, permanent dentition) | | 2 | 4 | |
| Theme 8. Mesial bite. Etiology, pathogenesis, prophylaxis, clinic and diagnostics. | 2 | 2 | 3 4 | |

| | | | | |
|--|-------------|-----------|-----------|--|
| Theme 9. Comprehensive treatment of mesial bite and its prognosis(milk, mixed, permanent dentition) | | 2 | | |
| Theme 10. Vertical bite anomalies. Deep bite Etiology, pathogenesis, prophylaxis. Clinic and diagnosis of deep bite. Etiological factors that contribute to deep bite. The role of bad habits in the formation of deep bite. | 2 | 2 | 3 | |
| Theme 11. Complex treatment of deep bite (milk, mixed, permanent dentition) | | 2 | 4 | |
| Theme 12. Open bite. Etiology, pathogenesis, prophylaxis, clinic and diagnostics. | | 3 | 3 | |
| Theme 13. Comprehensive methods of open bite treatment bite (milk, mixed, permanent dentition) | | 3 | 4 | |
| Theme 14. Transversal anomalies of bite. Cross bite. Etiology, pathogenesis, prophylaxis, clinic and diagnostics. | 2 | 3 | 3 | |
| Theme 15. Comprehensive cross bite treatment (milk, mixed, permanent dentition). | | 3 | 4 | |
| | | | 6 | |
| Theme 16. The choice of orthodontic appliances depending on the period of occlusion formation. Indications and contraindications to the use of non-removable orthodontic appliances. Preordodontic trainers. Removable and non-removable appliances | | 3 | 4 | |
| Theme 17. Summary lesson | | 3 | | |
| Total | 10 | 40 | 55 | |
| Total hours 105/ 3,5 credits | 10 | 40 | 55 | |
| Summary control | <i>exam</i> | | | |

**4. Thematic plan of lectures
from the discipline "Orthodontics"
for 4th year students of the Faculty of Dentistry**

| № | Theme of the lectures | hours |
|----------|--|--------------|
| 1 | Anomalies of teeth. Etiology, pathogenesis, clinic, diagnostics, prevention and treatment. Anomalies position of teeth. Etiology, pathogenesis, clinic, diagnostics, prevention and treatment. | 2 |
| 2 | Anomalies and deformation of dental arches. Crowding of the teeth. Secondary deformation of the dental arches in adults and children. Etiology, pathogenesis, clinic, diagnostics, prevention and treatment. | 2 |
| 3 | Sagittal anomalies of bite. Etiology, pathogenesis, clinic, diagnostics, prevention and treatment. | 2 |
| 4 | Vertical anomalies of bite. Etiology, pathogenesis, clinic, diagnostics, prevention and treatment. | 2 |

| | | |
|---|---|-----------|
| 5 | Transversal anomalies of bite. Etiology, pathogenesis, clinic, diagnostics, prevention and treatment. | 2 |
| Total lecture hours in discipline: | | 10 |

**5. Thematic plan of practical classes
from the discipline "Orthodontics"
for 4th year students of the Faculty of Dentistry**

| № | Theme | hours |
|---|---|--------------|
| 1. | Classification of dentoalveolar anomalies and deformations (Engle, Kalvelis, Betelman). Six keys of occlusion for Andrews. | 2 |
| 2. | Anomalies of teeth. Anomalies of the number, size, structure and teeth eruption. | 2 |
| 3. | Anomalies of the position of individual teeth. Treatment of anomalies of the position of individual teeth. Types of diastems. Retention. Methods of treatment | 2 |
| 4. | Anomalies and deformation of dental arches. | 2 |
| 5. | Sagittal anomalies of bite. Distal bite. Etiology, pathogenesis, prophylaxis. | 2 |
| 6. | Clinic and diagnosis of distal bite. Dentoalveolar and gnathic form. Differential diagnosis of distal bite. | 2 |
| 7. | Comprehensive treatment of distal bite in different periods of dentition formation (milk, mixed, permanent dentition) | 2 |
| 8. | Mesial bite. Etiology, pathogenesis, prophylaxis, clinic and diagnostics. | 2 |
| 9. | Comprehensive treatment of mesial bite and its prognosis (milk, mixed, permanent dentition) | 2 |
| 10. | Vertical bite anomalies. Deep bite Etiology, pathogenesis, prophylaxis. Clinic and diagnosis of deep bite. Etiological factors that contribute to deep bite. The role of bad habits in the formation of deep bite. | 2 |
| 11. | Complex treatment of deep bite (milk, mixed, permanent dentition) | 2 |
| 12. | Open bite. Etiology, pathogenesis, prophylaxis, clinic and diagnostics. | 3 |
| 13. | Comprehensive methods of open bite treatment bite (milk, mixed, permanent dentition) | 3 |
| 14. | Transversal anomalies of bite. Cross bite. Etiology, pathogenesis, prophylaxis, clinic and diagnostics. | 3 |
| 15. | Comprehensive cross bite treatment (milk, mixed, permanent dentition). | 3 |
| 16. | The choice of orthodontic appliances depending on the period of occlusion formation. Indications and contraindications to the use of non-removable orthodontic appliances. Preordodontic trainers. Removable and non-removable appliances | 3 |
| 17. | Final lesson. | 3 |
| Total | | 40 |
| Number of hours of practical classes in discipline | | 40 |

6. Thematic plan of independent work

**from the discipline "Orthodontics"
for 4th year students of the Faculty of Dentistry**

| № | Thecme | hours |
|--------------|--|--------------|
| 1 | Draw bite forms according to the Engle classification. | 4 |
| 2 | Draw anomalies of the position of individual teeth. Draw orthodontic devices that are used to treat the anomalies of the position of individual teeth. | 3 |
| 3 | Draw up the clinic of diastemas. Methods of their treatment depending on the period of bite. | 3 |
| 4 | Draw the typical shapes of dental arches narrowing. | 3 |
| 5 | Draw orthodontic devices (removable and non-removable) for treating narrowing and shortening of dental arches. | 4 |
| 6 | Draw the forms of distal bite according to the Engle classification. | 3 |
| 7 | Draw orthodontic devices for the treatment of distal occlusion, depending on the period of bite and clinical form. | 4 |
| 8 | Draw a mesial bite and an inverted incisive overlap (false progenia). | 3 |
| 9 | Draw orthodontic devices for mesial bite treatment depending on bite period. | 4 |
| 10 | Draw deep bite and deep overlap. | 3 |
| 11 | Draw orthodontic devices for the treatment of deep bite, depending on the period of bite. | 4 |
| 12 | Draw the clinical forms of open bite (in the frontal and lateral areas). | 3 |
| 13 | Draw orthodontic devices for the treatment of open bite, depending on the period of bite (plate with lining platform, device Volodkina, apparatus Herbst-Kozhukaru). | 4 |
| 14 | Draw the clinical forms of cross bite (accoding to classification Uzjumeckene). | 3 |
| 15 | Draw orthodontic devices for the treatment of cross bite depending on bite period. | 4 |
| 16 | To draw trainers (removable and non-removable) | 3 |
| Total | | 55 |

The educational process is organized according to the credit-transfer system

Types of educational activities of students according to the curriculum are:

- a) lectures;
- b) practical classes;
- c) independent work of students.

Thematic plans of lectures, practical classes and independent work ensure the implementation in the educational process of all topics that are part of the content module of the discipline "Orthodontics".

The topics of the lecture course (5 topics) reveal the most important problematic issues of the relevant sections of the discipline "Orthodontics".

The duration of the practical classes is 2 academic hours (90 minutes), and starting from 13 lessons - one hour (15 min.). Practical classes are conducted on a tape basis, are conducted in training rooms and clinical offices of the department.

The methodology of practical training in the discipline of "Orthodontics" provides:

1. Control of the student's independent work in preparation for the topic of the current lesson by checking the student's written performance in the Workbook of the relevant tasks - 10 minutes.
2. Test control (level α -2) of the initial level of knowledge and determination of the degree of students' readiness for class - 15 minutes.
3. Individual oral questioning of students, clarification of individual questions of the topic of the current class, answers to students' questions - 20 minutes, 30 minutes of 12 lessons.
4. For 30 minutes, and for 12 minutes, 50 minutes, students learn practical skills on phantoms and models. The teacher controls the work of students, gives explanations.
5. Control of the final level of students' knowledge - 15 minutes, 20 minutes of 12 lessons. It is carried out in the form of solving test problems (level α -3) or individual oral questioning, solving situational problems. Another 10 minutes beginning with 12 lessons, the teacher answers additional questions related to writing a medical history.

In completing the practical training, the teacher summarizes, gives students assignments for independent work, points to the key issues of the next topic and offers a list of literature for self-study.

For the implementation of the above methodology of organizing practical classes at the first lesson, each student is provided with a detailed plan of work during the period of study of the discipline, as well as the conditions for its completion. This plan includes:

- a list of theoretical knowledge of the discipline to be acquired by the student;
- a list of practical skills that each student must complete while studying the discipline;
- algorithms for performing basic dental manipulations on phantoms or models;
- Workbook for student's independent work in preparation for practical classes, in which it is necessary to complete a task in writing for each topic.

Independent work of students provides:

- preparation for practical classes;
- self-study of topics that are not included in the lesson plan, but are controlled and evaluated by the teacher during the final control.

9. Types of control: current control is carried out in the form of oral examination and test written control.

Form of final control according to the syllabus: exam.

Evaluation criteria

Control measures include current and final semester control.

10. Current control is carried out during the training sessions and is aimed at checking students' learning of the learning material.

10.1. Evaluation of current educational activities. It is carried out at each practical training according to the specific objectives of each topic. When evaluating the assimilation of each topic, students are given grades on a four-point (traditional) scale. This takes into account all types of work provided by the curriculum. The student must receive a grade on each topic. Forms of assessment of current activities should be standardized and include control of theoretical and practical training. Traded scores are converted to points.

At each practical session the student answers the tests on the topic of practical classes, standardized questions, knowledge of which is necessary for understanding the current topic, questions of the lecture course and independent work, which relate to the current lesson; demonstrates knowledge and skills of practical skills in accordance with the topic of the practical training.

Criteria for evaluation of students' current educational activity:

1) Assessment of student's independent work in preparation for the practical training. It is done by checking the written performance of the tasks outlined in the Workbook for preparation for each topic. The proportion of homework syllabus is 25% of the total grade for the lesson. If the student did not complete the independent work assignment and did not provide a synopsis for the teacher, then the traditional grade would be lower by 1 point.

2) Assessment of students' level of knowledge, which is accomplished by solving 10 test problems of format A (level α - 2)

A grade of "5" is given for this stage of the class if the student correctly answered 81-100% of the test tasks or gave the correct, complete answers to 3 teacher's control questions.

A grade of 4 is given when the student correctly answered 71-80% of the test tasks or gave correct, complete answers to 2 teacher's control questions and one incomplete or inaccurate answer - to the third.

A grade of 3 is given when the student correctly answered 61-70% of the test tasks or gave the correct answer to one teacher's test question and two incomplete or inaccurate answers to two questions.

A grade of 2 is given when the student correctly answered less than 60% of the test tasks, gave the correct answer to only one, or did not answer any of the teacher's test questions

3) Assessment of mastery of practical skills according to professional algorithms during the main stage of the practical training. It is carried out during the development of practical skills of the student on the model (phantom) or in writing the algorithm of its implementation.

A grade of 5 is given for this stage of the class if the student correctly, in accordance with the professional algorithm, performed on the model (phantom) the dental manipulation provided for the purpose of the practical class.

Grade "4" is given when the student knows the sequence of actions according to the professional algorithm, with minor errors performed on the model (phantom) dental manipulation provided for the purpose of practical training.

Grade "3" is given when the student does not fully know the professional algorithm of performing one or another manipulation, errors are made when performed on the model (phantom) of dental manipulation, provided for the purpose of practical training.

Grade "2" is given when a student does not know the professional algorithm of performing dental manipulation, cannot perform the dental phantom intended for practical training on the model (phantom).

The calculation of the number of points is based on the student's assessment of the traditional scale during the study of discipline during the semester by calculating the arithmetic mean (CA) rounded up to two decimal places. The resulting value is converted to a score on a multi-scale scale in the following way:

$$X = \frac{CA \times 120}{5}$$

**Recalculate the average for current activity in a multi-scale scale
for disciplines, culminating in a "graduated grade", an examination**

| 4- point scale | 120- point scale | 4- point scale | 120- point scale | 4- point scale | 120- балъна шкала | 4- балъна шкала | 120- point scale |
|----------------------|------------------------|----------------------|------------------------|----------------------|-------------------------|-----------------------|---------------------|
| 5 | 120 | 4.45 | 107 | 3.91 | 94 | 3.37 | 81 |
| 4.95 | 119 | 4.41 | 106 | 3.87 | 93 | 3.33 | 80 |
| 4.91 | 118 | 4.37 | 105 | 3.83 | 92 | 3.29 | 79 |
| 4.87 | 117 | 4.33 | 104 | 3.79 | 91 | 3.25 | 78 |
| 4.83 | 116 | 4.29 | 103 | 3.74 | 90 | 3.2 | 77 |
| 4.79 | 115 | 4.25 | 102 | 3.7 | 89 | 3.16 | 76 |
| 4.75 | 114 | 4.2 | 101 | 3.66 | 88 | 3.12 | 75 |
| 4.7 | 113 | 4.16 | 100 | 3.62 | 87 | 3.08 | 74 |
| 4.66 | 112 | 4.12 | 99 | 3.58 | 86 | 3.04 | 73 |
| 4.62 | 111 | 4.08 | 98 | 3.54 | 85 | 3 | 72 |
| 4.58 | 110 | 4.04 | 97 | 3.49 | 84 | <3 | Not enough |
| 4.54 | 109 | 3.99 | 96 | 3.45 | 83 | | |
| 4.5 | 108 | 3.95 | 95 | 3.41 | 82 | | |

The assessment for a module is defined as the sum of evaluations of the current educational activity (in balls) and the evaluation of final control (in balls), which is exposed in the evaluation of theoretical knowledge and practical skills in accordance with the lists determined by the discipline program.

The maximum number of points awarded to students when assimilating all the module (credit score) is 200, including 120 points (60%) for the current academic activity, 80 points (40%) according to the results of the final audit.

Assessment of independent work of the student.

Assessment of students' independent work, provided in the subject of independent work, is carried out by means of current control during practical classes during the cycle, and its mastering is controlled at the final control.

Final examination (exam)

It is conducted to evaluate the results of training at a certain educational qualification level and at individual completed stages according to the national scale and the ECTS scale. The final control includes semester control and student attestation and is determined by the work program in terms set by the work curriculum, the individual student's curriculum.

The exam is a form of final control of the student's acquisition of theoretical and practical material from a separate discipline for the semester, conducted as a control event. A student is considered to be admitted to the exam if he has attended all classroom training sessions provided for by the curriculum and completed all the types of work envisaged by the work program of this discipline and during his study, during the semester, scored points not less than the minimum (72 points).

The exam is conducted in writing in accordance with the schedule and includes 80 test tasks weighing 1 point each.

The form of the examination must be standardized and include the control of theoretical and practical training.

The maximum number of points a student can score for an exam is 80.

The minimum number of points during the examination - not less than 50.

Determination of the number of points the student got from the discipline

The score from the discipline that ends with the exam is determined as the sum of points for the current educational activity (not less than 72) and the marks for the exam (not less than 50 points).

Disciplines are independently converted into both the ECTS and 4-point scale. The ECTS scores on the 4-point scale are not converted and vice versa. Points of students studying in one specialty, taking into account the number of points scored from the discipline, are ranked on the ECTS scale as follows:

| Score points | Score on a 4-point scale |
|------------------------|--------------------------|
| From 170 to 200 points | 5 |

| | |
|---|---|
| From 140 to 169 points | 4 |
| From 139 points to the minimum number of points that a student must score | 3 |
| Below is the minimum number of points to be awarded by a student | 2 |

The ECTS mark on a traditional scale is not converted because the ECTS scale and the four-point scale are independent.

Objectivity of assessment of students' educational activity is checked by statistical methods (correlation coefficient between ECTS assessment and national scale assessment).

| ECTS Score | Statistical Index |
|------------|---------------------------------|
| A | Top 10% students |
| B | The next 25% of students |
| C | Next 30% of students |
| D | Next 25% of students |
| E | The last 10% of students |

Methodical support

Methodical developments for practical orthodontics classes for teachers and students, methodological developments on independent work on orthodontics, texts of lectures on orthodontics, tests.

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