

MINISTRY OF HEALTH PROTECTION OF UKRAINE**ODESSA NATIONAL MEDICAL UNIVERSITY
Department of Therapeutic Dentistry****"APPROVED"**

Acting vice-rector for scientific and pedagogical work


Eduard BURIACHKIVSKI

September 1, 2024

WORKING PROGRAM**ELECTIVE EDUCATIONAL DISCIPLINES****"Modern materials science in therapeutic dentistry"****Level of higher education: second (master's)****Field of knowledge: 22 "Health care"****Specialty: 221 "Dentistry"****Educational and professional program: Dentistry**

The study program of the academic discipline "Modern Materials Science in Therapeutic Dentistry" is based on the educational and professional program "Dentistry" of training specialists of the second (master's) level of higher education in the specialty 221 "Dentistry" of the field of knowledge 22 "Health care", approved by the Scientific Council of ONMedU (protocol No.10 dated June, 27 2024).

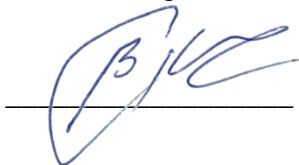
Developers:

doctor of medicine, prof. Skiba V.Ya.

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The program was discussed at the meeting of the department of therapeutic dentistry, protocol No 1 from 27.08. 2024.

Head of the department



Vasyl SKYBA

Agreed with the MEP guarantor



Anatoly GULYUK

Approved by the subject cycle methodical commission for dental disciplines of ONMedU
Protocol No. 1 dated 30.08. 2024.

The head of the subject cycle methodical commission for dental disciplines of ONMedU



Volodymyr KRYKLYAS

Reviewed and approved at the meeting of the department of

Therapeutic and pediatric dentistry

Protocol No. 1 of "2" september 2024

Head of Department



Oksana Dienha

1. Description of the educational discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline
The total number of: Credits: 3.0 Hours: 90 Content modules: 1	Field of knowledge 22 "Health care" Specialty 221 "Dentistry" Level of higher education second (master's)	<i>Full-time education</i>
		<i>Compulsory discipline</i>
		<i>Year of training: 2</i>
		<i>Semester III, IV</i>
		<i>Lectures (0 hours)</i>
		<i>Seminars (30 hours)</i>
		<i>Practical (0 hours)</i>
		<i>Laboratory (0 hours)</i>
		<i>Independent work (60 hours)</i>
		<i>including individual tasks (0 hours)</i> <i>The form of final control is credit</i>

2. The purpose and tasks of the educational discipline, competences, program learning results.

The purpose of studying the discipline "Modern Materials Science in Therapeutic dentistry" within the scope of professional specialization is to improve knowledge and skills regarding the selection and work with materials for antiseptic treatment, whitening and restoration of teeth, filling of root canals depending on their composition, structure, properties and indications for use with taking into account modern trends in the development of materials science.

The task of studying the discipline "Modern materials science in therapeutic dentistry" is: to form students' professional knowledge and skills in the treatment of diseases of hard dental tissues, complications of dental caries, diseases of periodontal tissues and oral mucosa with the help of knowledge and skills in using modern dental materials.

Competences and learning outcomes, the formation of which contributes to the discipline (interrelationship with the normative content of the training of higher education applicants, formulated in terms of learning outcomes in the Standard).

According to the requirements of the "Standard of Higher Education of Ukraine", the discipline "Modern Materials Science in Therapeutic Dentistry" ensures that students acquire the following **competencies**:

Integral competence:

The ability to solve typical and complex specialized tasks and problems in the field of health care / in the specialty "Dentistry", in professional activity or in the learning process, which involves conducting research and/or implementing innovations and is characterized by the complexity and uncertainty of conditions and requirements.

General competences (GC):

GC 1. Ability to abstract thinking, analysis and synthesis.

GC 2. Knowledge and understanding of the subject area and understanding of professional activity.

GC 3. Ability to apply knowledge in practical activities.

GC 6. Skills in using information and communication technologies.

GC 7. Ability to find, process and analyze information from various sources.

Special competences (SC):

SC 1. Ability to collect medical information about the patient and analyze clinical data.

SC 2. Ability to interpret the results of laboratory and instrumental research.

SC 5. Ability to design the process of providing medical care: determine the approaches, plan, types and principles of treatment of diseases of the organs and tissues of the oral cavity and maxillofacial area.

SC 7. The ability to determine the management tactics of patients with diseases of the organs and tissues of the oral cavity and maxillofacial region with concomitant somatic diseases.

SC 8. Ability to perform medical and dental manipulations.

SC 9. Ability to treat the main diseases of the organs and tissues of the oral cavity and maxillofacial region.

SC 14. Ability to maintain regulatory medical documentation.

Program learning outcomes (PLO):

PLO 20. To organize the necessary level of individual safety (own and the persons they care about) in case of typical dangerous situations in the individual field of activity

PLO 21. Perform medical manipulations on the basis of a preliminary and/or final clinical diagnosis (according to lists 2, 2.1) for different segments of the population and in different conditions (according to list 6).

PLO 22. To perform medical stomatological manipulations on the basis of preliminary and/or final clinical diagnosis (according to lists 2, 2.1) for different segments of the population and in different conditions (according to list 7).

As a result of studying the academic discipline, the student of higher education must:

Know:

- the organization of the work of the dental office. Functions and duties of medical personnel;
- ergonomics and safety issues;
- sanitary and hygienic requirements for work in dental departments/offices, including junior medical staff;
- modern medicinal products used as antiseptics for the treatment of the oral cavity, the root canal system, as well as for the direct treatment and prevention of caries complications;
- a list of basic and auxiliary modern dental materials, which are used for the treatment of diseases of the teeth, periodontal tissues and mucous membrane of the oral cavity, their positive qualities and disadvantages;
- composition and properties of modern dental materials used at the stages of both diagnosis and treatment of dental diseases, requirements for them;
- changes in the properties of materials for sealing and medical treatment under the influence of physical, mechanical and chemical factors, which can affect the quality of treatment;
- mechanisms of adhesion of various filling materials to tooth tissues, interaction of filling materials with each other;
- indications and contraindications for the use of materials;

Be able:

- to organize the work of medical personnel; form rational medical routes for patients; organize interaction with colleagues;
- determine indications and contraindications for the use of certain dental materials depending on the diagnosis and clinical course of the disease;
- use the preparation technique and the method of applying various sealing materials on the phantom;
- carry out medical treatment of the carious cavity and root canals depending on the daily requirements;
- apply various sealing materials as an isolating and therapeutic liners, temporary and permanent seals on the phantom;
- use modern sealing materials for sealing root canals on a phantom;
- use modern materials for medical dressing in periodontology;
- adhere to a healthy lifestyle, use self-regulation and self-control techniques.

- to be aware of and be guided in one's activities by civil rights, freedoms and duties, to raise the general educational cultural level.

3. The content of the educational discipline

"Modern materials science in therapeutic dentistry":

Topic 1. Modern medicinal products used as antiseptics for treatment of the oral cavity, carious cavities, root canal system, periodontal pockets, treatment and prevention of diseases of the mucous membrane of the oral cavity. Means for stopping the bleeding.

Topic 2. Indicators - for diagnosis and at the stages of treatment of dental diseases. Whitening systems for the treatment of discolored teeth.

Topic 3. Means for remineralizing therapy. Auxiliary materials (glycerin gels, impression materials, artificial rubber dam, etc.), tools and accessories used at various stages of treatment of dental diseases. Materials for periodontal dressings.

Topic 4. Filling materials in the clinic of therapeutic dentistry: clinical classification, their physical, chemical and mechanical properties. Temporary filling materials, isolating and therapeutic liners. Physico-chemical properties. Requirements for materials. Representatives

Topic 5. Filling materials in the clinic of therapeutic dentistry: materials for permanent fillings. Cements, metal materials. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives

Topic 6. Filling materials in the clinic of therapeutic dentistry: composite materials, compomers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives

Topic 7. Sealing materials for root canals: sealers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives

Topic 8. Sealing materials for root canals: fillers. Physico-chemical properties. Requirements for materials. Systematization and classification. Fiberglass pins.

4. Structure of the academic discipline:

Titles of topics	Number of hours	Titles of topics					Number of hours
		Incl udin g ever ythi ng	Including everything				
			lectur es	semin ars	practi cal	labo rator y	
Topic 1. Modern medicinal products used as antiseptics for treatment of the oral cavity, carious cavities, root canal system, periodontal pockets, treatment and prevention of diseases of the mucous membrane of the oral cavity. Means for stopping the bleeding.	12		4				8
Topic 2. Indicators - for diagnosis and at the stages of treatment of dental diseases. Whitening systems for the treatment of discolored teeth.	8		2				6
Topic 3. Means for remineralizing therapy. Auxiliary materials (glycerin gels, impression materials, artificial rubber dam, etc.), tools and accessories used at various stages of treatment of dental diseases. Materials for periodontal dressings.	10		4				6

Topic 4. Filling materials in the clinic of therapeutic dentistry: clinical classification, their physical, chemical and mechanical properties. Temporary filling materials, isolating and therapeutic liners. Physico-chemical properties. Requirements for materials. Representatives	12		4			8
Topic 5. Filling materials in the clinic of therapeutic dentistry: materials for permanent fillings. Cements, metal materials. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	12		4			8
Topic 6. Filling materials in the clinic of therapeutic dentistry: composite materials, compomers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	12		4			8
Topic 7. Sealing materials for root canals: sealers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	12		4			8
Topic 8. Sealing materials for root canals: fillers. Physico-chemical properties. Requirements for materials. Systematization and classification. Fiberglass pins.	12		4			8
Total	90		30			60

5. Topics of lectures / seminars / practical / laboratory classes

5.1. Topics of lectures

Lectures are not provided.

5.2. Topics of practical classes

Practical classes are not provided

5.3. Thematic plan of seminar classes

№ з/п	Topic name	Number hours
1	Topic 1. Modern medicinal products used as antiseptics for treatment of the oral cavity, carious cavities, root canal system, periodontal pockets, treatment and prevention of diseases of the mucous membrane of the oral cavity. Means for stopping the bleeding.	4
2	Topic 2. Indicators - for diagnosis and at the stages of treatment of dental diseases. Whitening systems for the treatment of discolored teeth.	2
3	Topic 3. Means for remineralizing therapy. Auxiliary materials (glycerin gels, impression materials, artificial rubber dam, etc.), tools and accessories used at various stages of treatment of dental diseases. Materials for periodontal dressings.	4
4	Topic 4. Filling materials in the clinic of therapeutic dentistry: clinical classification, their physical, chemical and mechanical properties. Temporary filling materials, isolating and therapeutic liners. Physico-chemical properties. Requirements for materials. Representatives	4
5	Topic 5. Filling materials in the clinic of therapeutic dentistry: materials	4

	for permanent fillings. Cements, metal materials. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	
6	Topic 6. Filling materials in the clinic of therapeutic dentistry: composite materials, compomers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	4
7	Topic 7. Sealing materials for root canals: sealers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	4
8	Topic 8. Sealing materials for root canals: fillers. Physico-chemical properties. Requirements for materials. Systematization and classification. Fiberglass pins.	4
Total		30

5.4. Topics of laboratory classes

Laboratory classes are not provided.

6. Independent work

№ з/п	Topic name	Number hours
1.	Topic 1. Modern medicinal products used as antiseptics for treatment of the oral cavity, carious cavities, root canal system, periodontal pockets, treatment and prevention of diseases of the mucous membrane of the oral cavity. Means for stopping the bleeding.	8
2.	Topic 2. Indicators - for diagnosis and at the stages of treatment of dental diseases. Whitening systems for the treatment of discolored teeth.	6
3.	Topic 3. Means for remineralizing therapy. Auxiliary materials (glycerin gels, impression materials, artificial rubber dam, etc.), tools and accessories used at various stages of treatment of dental diseases. Materials for periodontal dressings.	6
4.	Topic 4. Filling materials in the clinic of therapeutic dentistry: clinical classification, their physical, chemical and mechanical properties. Temporary filling materials, isolating and therapeutic liners. Physico-chemical properties. Requirements for materials. Representatives	8
5.	Topic 5. Filling materials in the clinic of therapeutic dentistry: materials for permanent fillings. Cements, metal materials. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	8
6.	Topic 6. Filling materials in the clinic of therapeutic dentistry: composite materials, compomers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	8
7.	Topic 7. Sealing materials for root canals: sealers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives	8
8.	Topic 8. Sealing materials for root canals: fillers. Physico-chemical properties. Requirements for materials. Systematization and classification. Fiberglass pins.	8
Разом		60

The performance of an individual task involves:

- mastering modern research methods in the university's research laboratories;
- preparation of a presentation or participation in the preparation of a student scientific report on one of the sections of the optional course "Modern Materials Science in Therapeutic Dentistry".
- Preparation of answers to theoretical questions on the topics of seminar classes.
- Solving test tasks of the "KROK" type 2.

7. Teaching methods

The teaching of the selective educational discipline "Modern materials science in therapeutic dentistry" in seminar classes is provided by methodical developments for each seminar class, visual teaching aids for each class (presentations, video lectures), the department's information resource, and structured skill control algorithms.

Independent work in the study of a selective academic discipline is ensured by methodical developments for independent work, visual teaching aids (video lectures, presentations), information resource of the department, topics of independent work, structured algorithms of skill control.

There is no final control, the study of the discipline ends with a credit at the last seminar class.

8. Forms of control and assessment methods (including criteria for evaluating learning outcomes)

Current control:

1. Evaluation of theoretical knowledge on the subject of the lesson:

methods: survey, solving a situational clinical problem;

the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.

2. Evaluation of practical skills and manipulations on the subject of the lesson:

methods: assessment of the correctness of the performance of practical skills, role play.

the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.

The grade for one practical session is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

Current evaluation criteria in practical training

Mark	Current evaluation
«5»	The applicant is fluent in the material, takes an active part in discussing and solving a situational clinical problem, confidently demonstrates practical skills during the when working on a phantom and interpreting clinical, laboratory and instrumental research data, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
«4»	The applicant has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the when working on a phantom and interpreting clinical, laboratory and instrumental research data with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
«3»	The acquirer does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of a situational clinical problem, demonstrates practical skills during the when working on a phantom and interpreting clinical, laboratory and instrumental research data with significant errors.
«2»	The acquirer does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the when working on a phantom and interpreting clinical, laboratory and instrumental research data.

Final control: credit.

Credit is given to the applicant who completed all tasks of the work program of the academic discipline, took an active part in practical classes, completed and defended an individual assignment and has an average current grade of at least 3.0 and has no academic debt.

Assessment is carried out: at the last lesson before the beginning of the examination session - with the tape system of learning, at the last lesson - with the cyclical system of learning. The credit score is the arithmetic mean of all components according to the traditional four-point scale and has a value that is rounded according to the statistics method with two decimal places after the decimal point.

9. Distribution of points received by higher education applicants

The average score for the discipline is translated into a national score and converted into points on a multi-point scale (200-point scale).

The conversion of a traditional grade into a 200-point grade is performed by the information and technical department of the University using the "Contingent" program according to the formula:

$$\text{Average success score (current success in the discipline)} \times 40$$

Table of conversion of traditional assessment to multi-point assessment

National assessment for discipline	The sum of points for the discipline
Excellent ("5")	185 – 200
Good ("4")	151 – 184
Satisfactory ("3")	120 – 150
Unsatisfactory ("2")	Less 120

A multi-point scale (200-point scale) characterizes the actual success of each applicant in learning the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is given to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

According to the ECTS rating scale, the achievements of students in the educational component who study in the same course of the same specialty are evaluated, according to the points they received, by ranking, namely:

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

Score on a scale ECTS	Statistical indicator
A	Top 10% achievers
B	The next 25% of earners
C	The next 30% of earners
D	The next 25% of earners

E	The next 10% of earners
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10. Methodical provision

1. Working curriculum in the discipline "Modern materials science in therapeutic dentistry".
2. Methodological developments for students for seminar classes.
3. Questions and tasks for current control of students' knowledge and skills.
4. Textbooks and study guides.
5. Scientific works of professors and teaching staff of the department and other researchers on problems of philosophy and methodology of science.
6. A collection of test tasks, an electronic bank of test tasks, situational tasks as part of methodological developments for seminar classes.

11. Questions for preparing for the final inspection

1. Medicinal products used as antiseptics for treatment of the oral cavity.
2. Medicinal products used as antiseptics for the treatment of carious cavities.
3. Medicinal products used as antiseptics for treatment of the root canal system, for chemical expansion of the canals.
4. Medicinal products used as antiseptics for the treatment of periodontal pockets.
5. Antiseptics for the treatment and prevention of diseases of the mucous membrane of the oral cavity.
6. Means for stopping bleeding.
7. Indicators - for diagnosis and at the stages of treatment of caries and its complications
8. Whitening systems for the treatment of discolored teeth.
9. Means for remineralizing therapy.
10. Auxiliary materials (glycerin gels, impression materials, artificial rubber dam, etc.).
10. Tools and accessories used at various stages of treatment of dental diseases.
11. Materials for periodontal bandages.
12. Filling materials in the clinic of therapeutic stomatology: clinical classification, their physical, chemical and mechanical properties.
13. Temporary sealing materials, insulating and medical pads. Physico-chemical properties. Requirements for materials. Representatives
14. Filling materials in the clinic of therapeutic dentistry: materials for permanent fillings. Dental cements. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives
15. Metal materials. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives
16. Composite materials. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives
17. Compomers. Physico-chemical properties. Requirements for materials. Systematization and classification. Representatives
18. Sealers. Physico-chemical properties. Requirements for materials. Systematization and classification.
19. Sealing materials for root canals based on phenol-formaldehyde. Physico-chemical properties. Method of cooking.
20. Sealing materials for root canals based on zinc oxide and eugenol. Physico-chemical properties. Method of cooking.
21. Sealing materials for root canals on artificial resins. Physico-chemical properties. Method of cooking.
22. Sealing materials for root canals based on calcium hydroxide. Physico-chemical properties. Method of cooking.
23. Cements for sealing root canals. Physico-chemical properties. Method of cooking.
24. Fiberglass pins.

25. Sealing materials for root canals: fillers. Requirements for materials. Systematization and classification.

12. Recommended literature

Basic:

1. Materials science in dentistry: a study guide/[Korol D.M., Korol M.D., Ojubeiska O.D. etc.] in general ed. King D.M. – Vinnytsia: New book – 2019. – 400 p.: illustrations.
2. Bidenko N.V., Borysenko A.V., Vasylichuk O.V. etc.. Algorithms for performing dental and medical manipulations for preparation for the State certification of students of the 5th year in the specialty "Dentistry". - Kyiv: Kniga-plus, 2017. - 408 p.
3. Danylevskiy M.F., Borysenko A.V., Sidelnikova L.F., Nesyn O.F., Dikova I.G. Therapeutic dentistry. Propaedeutics of therapeutic stomatology. T.1. - 3rd edition. — Kyiv: Medicine, 2017. — 360 p.
4. Operative Dentistry: in 2 volumes. – Volume 1: Endodontics = Operative dentistry: in 2 volumes. – Volume 1: Endodontics: textbook / edited by A.V. Borysenko - Kyiv: Medicine, 2016. - 384 p.

Auxiliary:

1. Borysenko A.V., Antonenko M.Yu., Sidelnikova L.F., Melnychuk T.A. Essays on practical periodontology. - K.: LLC "Library "Health of Ukraine" - Kyiv: "Library "Health of Ukraine", 2017. — 348 p.
2. Borysenko A.V. Dental caries. Pulpitis. Apical periodontitis. Oral sepsis: a textbook/ A.V. Borysenko, M. Yu. Antonenko, Yu. G. Romanova, S. A. Shnayder [et al.]; ed. By A. V. Borysenko. - Odessa: Astro, 2015. - 314 p.
3. Composite sealing and facing materials: study guide (university IV level a.) / A. V. Borysenko, V. P. Nespryadko, D. A. Borysenko. - K.: Medicine.-2015. - 300 s.
4. Gehrig J. Fundamentals of Periodontal Instrumentation and Advanced Root Instrumentation by, 8 edition / Jill Gehrig, Rebecca Sroda. - Wolters Kluwer; 2016. - 800
5. Banerjee A. Pickard's Guide to Minimally Invasive Operative Dentistry. 10 Edition. / Avit Banerjee, Timothy F. Watson. - Oxford University Press, 2015. - 208
6. Information and educational environment info.onmedu.edu.ua

13. Information resources

1. Official website of ONMedU <https://onmedu.edu.ua/>
2. Electronic information resources of the ONMedU library <http://info.odmu.edu.ua/>
 - Electronic catalog of the library.
 - Information and reference sources: encyclopedias, directories, dictionaries
 - Educational electronic publications and resources: manuals containing systematized material within the curriculum of the academic discipline.