

PRIVATE HIGHER EDUCATIONAL INSTITUTION  
"INTERNATIONAL ACADEMY OF ECOLOGY AND MEDICINE"  
Department of Dentistry

**SYLLABUS**  
**EDUCATIONAL DISCIPLINE**  
**Elective course**

**«Basic technologies for the preparation of dentures»**


**LEVEL OF HIGHER EDUCATION**    The second (master's) level

**DEGREE OF HIGHER EDUCATION**    Master

**FIELD OF KNOWLEDGE**    22 Healthcare

**SPECIALTY**    221 Dentistry

***COURSE***    *2*

Considered and approved  
at a meeting of the Department of Dentistry  
Protocol № 1 from «01» 09 2020 p.  
Acting head of the department \_\_\_\_\_  
MD, prof.  Kuts P.V.

**Kiev 2020**

<b>1. General information</b>	
<b>Subject</b>	<b>Elective course</b> «Basic technologies for the preparation of dentures»
<b>Lector</b>	Acting Head of the Department, Doctor of Medical Sciences, Professor, Kuts Pavlo Valeriyovych, Bida Alexander Vitalievich
<b>Teacher's e-mail</b>	<a href="mailto:forum-for-me@bigmir.net">forum-for-me@bigmir.net</a>
<b>Discipline format</b>	Normative discipline.
<b>The volume of the discipline</b>	60 hours , 2 ECTS
<b>Link to the distance learning site</b>	maem.kiev.ua
<b>Consultations</b>	Web conferences in various programs (Zoom, Skype, Myit, Jitsy, Teams, Viber, Facebook, Cisco Webs). Exchange tasks via e-mail, Wandrive
<b>2. Annotation to the course</b>	
<p>The elective course "Basic technologies for making dentures" as a discipline is based on the study of human anatomy and physiology by students; medical and biological physics, medical biology and chemistry and integrates with these disciplines;</p> <p>lays the foundations for students to study propaedeutics of orthopedic dentistry and orthopedic dentistry, which involves the integration of teaching with these disciplines and the formation of skills to apply the acquired knowledge in the process of further study and in professional activities.</p> <p>The content of the discipline is structured into 1 module, which is a complete, logically integrated in content curriculum, which is implemented by appropriate forms of organization of the educational process. Practical classes involve students mastering the theoretical foundations of the technology of manufacturing removable and non-removable dentures.</p>	
<b>3. Purpose and objectives of the course</b>	
<ul style="list-style-type: none"> <li>- The main purpose of studying the selective discipline "Basic technologies of dentures" is to acquaint students with the basic technological processes used for the manufacture of fixed and removable orthopedic structures. Mastering this discipline lays the foundations for the study of propaedeutics of orthopedic dentistry and orthopedic dentistry, involves the integration of teaching with these disciplines and the formation of skills to apply the acquired knowledge in the process of further study and in professional activities.</li> <li>- On the basis of the ultimate goals of the discipline, specific tasks are formulated to study the subject in the form of certain professional skills that ensure the achievement of the goal.</li> <li>- Certain goals of the study of the content module include the ability of students to determine the indications and contraindications to the use of tabs, artificial crowns, pin structures, bridges, partial removable plate, full removable and clasp prostheses; explain the technological features of their manufacture; be able to interpret the mechanical, technological, physical, chemical and biological properties of materials for the manufacture of orthopedic structures; give a theoretical justification for the choice of certain materials depending on the type of prosthesis; explain the importance of certain materials for the manufacture of orthopedic structures; analyze the requirements for materials; analyze the composition, properties and applications of certain groups of dental materials; demonstrate on phantoms clinical and laboratory stages of manufacturing non-removable and removable structures; analyze the advantages and disadvantages of these designs and justify the choice of materials for their manufacture.</li> </ul>	
<b>4. Competencies and learning outcomes</b>	
Learning outcomes	Teaching methods
Introduction to modern technologies for the manufacture of removable and	Lectures, practices, oral interviews, tests, dialogue with applicants for higher education, creative work with the

non-removable dentures, materials and technologies used in dental prosthetics.	creation of multimedia presentations and their presentation, independent work with literary sources		
<p>Competences</p> <ul style="list-style-type: none"> <li>- In accordance with the requirements of the Standard of Higher Education, the discipline provides students with the acquisition of competencies (relationship with the normative content of training of higher education, formulated in terms of results in the Standard).</li> </ul> <p>Integral:</p> <ul style="list-style-type: none"> <li>- Ability to solve problems and problems in the field of health care by specialty</li> <li>- "Dentistry" in professional activities or in the learning process, which involves research and / or innovation.</li> </ul> <p>General:</p> <ul style="list-style-type: none"> <li>- Ability to abstract thinking, analysis and synthesis; ability to learn and be modernly trained</li> <li>- Knowledge and understanding of the subject area and understanding of the profession</li> <li>- Ability to apply knowledge in practical situations</li> <li>- Ability to communicate in the state language both orally and in writing.</li> <li>- Ability to communicate in other languages</li> <li>- Skills in the use of information and communication technologies</li> <li>- Ability to search, process and analyze information from various sources</li> <li>- Ability to adapt and act in a new situation, the ability to work autonomously</li> <li>- Ability to identify, pose and solve problems</li> <li>- Ability to choose a communication strategy</li> <li>- Ability to work in a team</li> <li>- Interpersonal skills.</li> <li>- Ability to act on ethical considerations</li> <li>- Skills for safe activities</li> <li>- The desire to preserve the environment</li> <li>- Ability to act socially responsibly and civically consciously</li> </ul> <p>Special:</p> <ul style="list-style-type: none"> <li>- Ability to understand the subject area of the discipline</li> <li>- Understanding the relationship of composition, structure, properties, production technology and application of materials for dentistry</li> <li>- Understanding the patterns of change in the properties of materials under the influence of physical, mechanical and chemical factors</li> </ul>			
<b>5. Organization of course training</b>			
<i>The volume of the course</i>			
Type of lesson	<b>Total amount of hours</b>		
Lectures	6		
Practical classes	14		
Independent work	40		
<i>Course signs</i>			
Semester 3	Specialty <u>221 Dentistry</u>	Course (year of study) 2	<b>Elective course</b>
<i>Course thematics</i>			
<b>THEMATIC PLAN</b> <b>"BASIC TECHNOLOGIES OF MANUFACTURE OF DENTURES"</b>			
№	Topic lectures		Hours

1	Wax modeling of fixed and removable orthopedic structures. Characteristics of modeling materials.	2
2	The method of stamping in the manufacture of orthopedic structures. Technology of work with sheet thermoplastic material.	2
3	Casting method in the manufacture of removable and non-removable orthopedic structures. Characteristics of alloys of metals and materials that are used for the manufacture of cast structures.	2
Topic practices		
4	Replacement of wax with plastic in the process of manufacturing non-removable and removable orthopedic structures. Characteristics of basic and auxiliary materials. Comparative characteristics of compression and injection molding of plastics.	2
5	Technology of work with thermoplastic materials (Valplast). Benefits and disadvantages, features of work with thermoplastic materials.	2
6	Milling in the manufacture of removable and non-removable orthopedic structures. CAD-CAM technology. Electroplating in the manufacture of orthopedic structures. Technology and indications for use. Characteristics of materials.	2
7	Soldering and laser welding technology in the manufacture of orthopedic structures. Characteristics of basic and auxiliary materials.	2
8	Technology of manufacturing orthopedic structures from ceramic masses. Indications for use. Characteristics of ceramic masses.	2
9	Composites in orthopedic dentistry. Areas, methods of application. Characteristics of composite materials.	2
10	Technology of processing of orthopedic designs. Characteristics of materials and tools. Test	2
	Total	20

**THEMATIC PLAN OF INDEPENDENT WORK ON THE DISCIPLINE  
"BASIC TECHNOLOGIES OF MANUFACTURE OF DENTURES"**

№	Topic	Hours	type of control
1	Draw a diagram of the gingival junction, and be able to explain the structure of the periodontium.	5	Current control on practical classes
2	Draw safety zones of teeth during preparation, clinical significance during preparation for permanent restorations.	5	Current control on practical classes
3	Tools for tooth preparation. Species, their characteristics. Application at various methods of preparation.	5	Current control on practical classes
4	Comparative characteristics of methods of preparation for different restorations (cast crowns, veneers, tabs, overlays).	5	Current control on practical classes
5	Wax modeling wax up: meaning, principles, technique, scope.	5	Current control on practical classes

6	Digital technologies for making dentures	5	Current control on practical classes
7	CAD \ CAM system, manufacturing of multilayer designs	5	Current control on practical classes
8	Lithium disilicate, zirconium dioxide, feldspar ceramics. Advantages, indications for use.	5	Current control on practical classes
Total		40	

### 6. Course evaluation system

General course evaluation system

**Current control** is performed based on the control of theoretical knowledge, skills and abilities in practical classes. Independent study students are assessed in practical classes, and is an integral part of the final grade of the student. Current control is performed during the training sessions and aims at checking the assimilation of students learning the material. Forms of current control are:

- a) test tasks with a choice of one correct answer, with the definition of the correct sequence of actions, with determination of the conformity, defining the specific portion of the photo or diagram ("detection");
- b) individual oral questioning, interview;
- c) the solution of typical situational tasks;
- g) control of practical skills;

Grades on the national scale ("excellent" - 5, "good" - 4, "satisfactory" - 3, "unsatisfactory" - 2), received by students, are displayed in the journals of attendance and academic group performance.

**Final control**

For disciplines, the form of final control of which is credit: Evaluation of current educational activities. During the assessment of mastering each topic for the current educational activity of the student, grades are set according to a four-point (traditional) assessment scale. This takes into account all types of work provided by the discipline program. The student must receive a grade on each topic (in each lesson on practical training). Scores on the traditional scale are converted into points. The final grade for the current academic activity is recognized as the arithmetic mean (the sum of grades for each lesson is divided by the number of lessons per semester) and translated into points according to Table 1.

**Table 1. Conversion of the average grade for current activities in a multi-point scale (for disciplines that end with a credit)**

4-ball	200- ball	4-ball	200- ball	4-ball	200- ball	4-ball	200- ball
5	200	4,47	179	3,94	158	3,42	137
4,97	199	4,45	178	3,92	157	3,4	136
4,95	198	4,42	177	3,89	156	3,37	135
4,92	197	4,4	176	3,87	155	3,35	134
4,9	196	4,37	175	3,84	154	3,32	133
4,87	195	4,35	174	3,82	153	3,3	132
4,85	194	4,32	173	3,79	152	3,27	131
4,82	193	4,3	172	3,77	151	3,25	130
4,8	192	4,27	171	3,74	150	3,22	129
4,77	191	4,24	170	3,72	149	3,2	128

4,75	190	4,22	169	3,7	148	3,17	127
4,72	189	4,19	168	3,67	147	3,15	126
4,7	188	4,17	167	3,65	146	3,12	125
4,67	187	4,14	166	3,62	145	3,1	124
4,65	186	4,12	165	3,6	144	3,07	123
4,62	185	4,09	164	3,57	143	3,05	122
4,6	184	4,07	163	3,55	142	3,02	121
4,57	183	4,04	162	3,52	141	3	120
4,55	182	4,02	161	3,5	140	More than 3	Not enough
4,52	181	3,99	160	3,47	139		
4,5	180	3,97	159	3,45	138		

**The maximum number** of points that a student can collect for current educational activity during semester is **200 points**.

**The minimum number** of points that a student can collect for current educational activity during semester is **120 points**.

Calculating of the number of points is based on obtained marks of student according to traditional scale while learning subject during the semester, by calculating the arithmetic mean (AM) that is rounded to two signs after comma.

**Evaluation of independent work of students.** Independent work of students, which is provided by the topic of the lesson together with the classroom work, is evaluated during the current control of the topic in the relevant lesson.

Requirements for written work	The final written work is performed in the form of a test.
Practical classes	Classroom work

### *The 2nd semester*

Classroom work - from 2 to 5 points for each topic.

Amount: minimum 120, maximum 200

The list of theoretical questions to prepare students for the exam.

The list of practical skills for final module control

- Application of the modeling method and features of the tab modeling itself in the direct and indirect method of manufacture.
- Modeling technique in the process of making stamped crowns.
- Methods of modeling solid crowns and bridges.
- Features of modeling of solid frames of removable prosthesis structures.
- Features of modeling of removable plate partial and complete prostheses.
- Characteristics of modeling materials.
- Requirements for modeling materials.
- Modeling wax for bases: composition and application.
- Modeling wax for fixed prostheses.
- Its properties and applications.
- Modeling wax for clasp work: types and applications.
- Disadvantages of waxes and wax compositions.
- The method of stamping in the manufacture of orthopedic structures.
- Technology of production of artificial stamped crowns: Parker's method of external stamping, method of internal stamping of crowns, method of combined stamping of crowns
- Technology of work with sheet thermoplastic material.
- Stamping of occlusal caps: types, requirements, quality criteria, features of production.
- Casting method in the manufacture of removable and non-removable orthopedic structures.

- Casting methods: injection molding, centrifugal casting, vacuum casting.
- Comparative characteristics of castings modeled on and without a refractory model.
- Errors and complications in the casting process.
- Criteria for evaluating cast denture structures.
- Algorithm of casting technique.
- Characteristics of alloys of metals and materials used for the manufacture of cast structures.
- Metal alloys in orthopedic dentistry.
- Classification of metal alloys.
- Chromonic nickel alloys: composition, properties, applications.
- Cobaltochrome alloys: composition, properties, applications.
- Alloy based on titanium, tantalum, etc.
- Composition, properties, application of molding materials.
- Requirements for molding materials.
- Replacement of wax with plastic in the process of manufacturing non-removable and removable orthopedic structures.
- Characteristics of basic and auxiliary materials.
- Technology of wax replacement with plastic in the manufacture of temporary plastic crowns and bridges.
- Technology of wax replacement with plastic in the manufacture of combined crowns and bridges.
- Technology of wax replacement with plastic in the manufacture of removable partial and complete plate prostheses.
- Comparative characteristics of compression and injection molding of plastics.
- Classification of plastics.
- Plastics of hot polymerization: composition, properties, application.
- Plastics of cold polymerization: composition, properties, application.
- Base plastics of hot polymerization: composition, properties, application.
- Cold polymerization base plastics: composition, properties, application.
- Elastic backing materials.
- Polymerization, stages of polymerization.
- Polymerization mode.
- Errors and complications that may occur when replacing wax with plastic. Technology of working with thermoplastic materials: the composition of thermoplastics, scope, representatives, technology of casting, polymerization, processing.
- Milling in the manufacture of removable and non-removable orthopedic structures.
- CAD-CAM technology.
- Materials for the manufacture of orthopedic structures by milling. Areas of application. Material support. Methods of fingerprinting. Features of modeling of orthopedic structures.
- Electroplating in the manufacture of orthopedic structures. Technology and indications for use. Characteristics of materials.
- Technology of soldering and laser welding in the manufacture of orthopedic structures. Characteristics of basic and auxiliary materials. Scope.
- Comparative characteristics of the soldering and laser welding process.
- Technology of manufacturing orthopedic structures from ceramic masses. Indications for use.
- Characteristics of ceramic masses.
- Methods of facing metal frames of fixed dentures with ceramic masses.
- Classification of ceramic masses and features of their application.
- Features of color reproduction as a criterion of aesthetics with ceramic masses.
- Composites in orthopedic dentistry. Areas, methods of application.
- Characteristics of composite materials for the creation of orthopedic structures.
- Technology of processing of orthopedic designs. Characteristics of materials and tools.
- Composition, properties, use of fluxes and bleaches.
- Natural and artificial abrasives.
- Composition, properties, application of abrasive materials.

- Composition, properties, application of separating varnishes.

### 7. Course policy

The organization of the educational process is carried out with the use of the European Credit Transfer System (ECTS) to assess student performance. The points gained in the current survey, independent work and points of the final control are credited. This must take into account the student's presence in class and his activity during practical work. Inadmissible: absences and late classes; use of a mobile phone, tablet or other mobile devices during the lesson (except for the cases provided by the curriculum and methodical recommendations of the teacher); copying and plagiarism; untimely performance of the task, the presence of unsatisfactory grades for 50% or more of the submitted theoretical and practical material.

### 8. RECOMMENDED LITERATURE

#### 1. Basic:

1. Gasyuk PA, Kostenko EY, Machogan VR, Rosolovskaya SO, Vorobets AB, Radchuk VB Stud Book of Orthopedic Dentistry. Ternopil-Uzhhorod. 2018. - 369 p.
2. Rozhko MM, Nespryadko VP, Mikhailenko TN etc. Dental prosthetic equipment. - К.: Книга-плюс, 2016. - 604 с.
3. Dentistry. Textbook. In 2 books. - Book. 1 / MM Rozhko, ZB Popovich, VD Kuroyedova and others; for order. Prof. M.M.Рожка. - К.: ВСВ «Медицина», 2013. - 872 с.
4. Gasyuk PA Almanac of orthopedic dentistry // PA Gasyuk, E. Ya. Kostenko, VR Machogan, SO Rosolovskaya, AB Vorobets // Ternopil: Bogdan - 2015. - 352с.
5. Gasyuk PA Technological aspects of manufacturing orthopedic structures // PA Gasyuk, DM Korol, SO Rosolovskaya, LS Korobeynikov, VB Radchuk, RV Kozak // Ternopil: FOP Parkhin RA - 2016. - 140p.
6. King DM Fundamentals of clasp prosthetics / DM King, DD Kindiy, LS Korobeynikov, OD Odzhubeyanskaya, RV Kozak, TP Malyuchenko // Poltava. - 2016 - 139p.
7. Korol MD Dental materials science / MD Korol, OD Odzhubeyanskaya, DM Korol, IM Tkachenko, VM Petrushanko, MO Ramus, AD Dorubets, DD Kindiy, LS Korobeynikov // Poltava: FOP Myron IA - 2018. - 176p.
8. Fastovets OO Non-removable dental prosthetics: a textbook / OO Fastovets, RA Kotelevsky, SS Kobyljak // Dnipro: DMA. - 2013. - 212p.

#### 2. Additional:

1. Golik VP All-ceramic restorations of hard tissues of teeth. Textbook / VP Golik; IV Yanishen, A. Yu. Nikonov, IO Pereshivailova // Kh.: KhNMU. - 2016. - 14p.
2. Golik VP Replacement of defects of hard tissues of a tooth by pin designs. Indications. Clinical and laboratory stages of production. Textbook / VP Golik; OS Maslovsky, IV Yanishen, OO Berezhna, AV Pogorila // Kh.: KhNMU. - 2015. - 27p.
3. Gasyuk AP Human odontology / AP Gasyuk, PA Gasyuk, TV Novoseltseva // Saarbrücken: LAMBERT Academic Publishing. - 2015. - 181p.

Lector



Bida Alexander Vitalievich