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Redacția: 06

Data: 20.09.2017

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FACULTY OF STOMATOLOGY

STUDY PROGRAM 0911.1 STOMATOLOGY

DISCIPLINE OF MICROBIOLOGY AND IMMUNOLOGY

APPROVED

at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum Faculty of Stomatology
Minutes No. 01 of 26.09.2023
Chairman PhD., associate professor

Stepco Elena

APPROVED

at the Council meeting of the Faculty of Stomatology
Minutes No. 02 of 09.11.2023
Dean of Faculty of Stomatology
PhD. Profesor

Solomon Oleg

APPROVED

approved at the meeting of the Discipline of microbiology and immunology
Minutes Nr. 1 from 28. 08. 2023
Head of chair, PhD., associate professor

Greta Balan



SYLLABUS

The discipline **ORAL MICROBIOLOGY**

Integrated studies

Type of course: **Compulsory**

Syllabus developed by the collective of authors:

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Chișinău, 2023



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I. PRELIMINARY

• **General presentation of the discipline: the place and role of the discipline in the formation of the specific competences of the vocational / specialty training program**

The course of Oral microbiology aims at forming the medical thinking of dental students and the appreciation of the importance of bacteriology and virology in the context of infectious pathology.

The content of the course is well structured to elucidate the role of oral microbiology in forming the professional skills of the future specialist; the relationships between the microorganism and the macroorganism, the complexity of the methods of studying these relationships; formulation of goals, tasks and objectives of etiological diagnosis of infectious pathology, sampling rules, storage, transport and labeling, principles of laboratory diagnostics, methods of determining the susceptibility of microorganisms to antimicrobial preparations, studying the relationships between microorganisms in biocenoses, technologies for studying bacteriophage; studying the interaction between the macroorganism and the microorganism under different conditions, studying the bases of macroorganism non-receptivity; demonstrating the importance of immunodiagnostics, the group of immunoprophylactic and immunotherapeutic biological preparations. Another objective of the course is the application of fundamental knowledge in oral microbiology: the main germs involved in oral pathology.

Syllabus mission in professional training

Oral microbiology is intended to provide students with theoretical knowledge and practical skills that they can use in dental practice: microbiological research, the role of pathogenic microorganisms and pathogenic conditions in oral pathology. The second objective ensures the need to influence and control the beneficial and harmful effects of oral microflora. The third objective is the understanding of microorganism → macroorganism mechanisms and the importance of this relationship in the pathology of the oral cavity.

Language of instruction: Romanian, Russian, English.

Beneficiaries: : students of the IInd year, Faculty of Stomatology.

II. ADMINISTRATION OF DISCIPLINE

Code of discipline	F.04.O.044		
Name of the discipline	Oral microbiology		
Responsible for discipline	PhD, associate professor, Balan Greta		
The year	II	Semester	IV
Total number of hours including:			90
course	15	Laboratory work	15
seminars	15	Individual work	45
Evaluation form	E	Number of credits	3



III. TRAINING OBJECTIVES IN THE DISCIPLINE

At the end of the course, the student will be able to:

To know:

- theoretical basis of dental microbiology.
- diagnostic methods used in bacterial infections and factors influencing the results.
- knowledge of indications in bacteriological diagnosis.
- knowledge of virus biology and principles of laboratory diagnosis of viral etiology infections.
- knowing the microorganisms that habituate the oral cavity.
- understanding the importance of pathogenic and pathogenic microorganisms in triggering the pathological processes of the oral cavity.
- knowing the mechanisms of initiation of cross-infection in the dental office.
- the importance of oral ecology, the factors that control the condition of the appearance of the oral microbiota.
- knowing the role of microorganisms in the development of dental plaque and tartar.
- the importance of microorganisms in triggering specific and non-specific infectious processes of the oral cavity.

To apply:

- Dexterities in harvesting samples to be analyzed for microbiological investigations;;
- skills to interpret the results of microbiological analysis;
- skills for the use of techniques for determining microorganisms isolated from the oral cavity;
- dexterity of disinfection and sterilization of reusable materials and instruments in the dental office..

Integrate:

- Microbiological knowledge obtained in the context of the future profession;
- Understanding the interconnection between microbiology and other related disciplines;
- Implementation and integration of microbiological knowledge in dental disciplines;
- Implementing the knowledge gained in the research activity;
- Critical and reliable use of scientific information obtained using the new information and communication technologies;
- Using multimedia technology to receive, evaluate, store, produce, present and exchange information, and communicate over networks over the Internet.

IV. PREVIOUS CONDITIONS AND REQUIREMENTS

At the level of medical university studies the integration into a single discipline of bacteriology, virology, mycology and oral microbiology aims at ensuring a closest representation of the reality of what are the microorganisms as well as the relationships of the microorganisms with their human host and the abiotic environment in which they live.

For the good acquisition of oral microbiology, the conceptual, methodological and factual support is required by the important contribution of chemistry, biochemistry, physics, biophysics, physiology, genetics, cellular and molecular biology.

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V. ORIENTAL TIME TABLE AND ORIENTAL DISTRIBUTION OF HOURS***Courses (lectures), practical works / laboratory works / seminars and individual work***

Nr. d/o	TEMA	Number of hours		
		Lectures	Seminars	Individual work
1.	Microbiology and laboratory diagnosis of infections caused by gram-positive and gram-negative pathogenic cocci.	1	2	3
2.	Microbiology and laboratory diagnosis of infections caused by microorganisms of the genus <i>Corynebacterium</i> , <i>Bordetella</i> and <i>Haemophilus</i> .	1	2	3
3.	Microbiology and laboratory diagnosis of spirochetozes	1	2	3
4.	Microbiology and laboratory diagnosis of infections caused by gram-negative bacilli (enterobacteria and nonenterobacteria).	1	2	3
5.	Microbiology and laboratory diagnosis of infections caused by aerobic gram-negative bacilli (Nonlactos fermenters).	1	2	3
6.	Microbiology and laboratory diagnosis of infections caused by microorganisms with intracellular parasite (rickettsioses, chlamidiosis, mycoplasmoses).	1	2	3
7.	Viruses. Biological characteristics. Classification of viruses and nomenclature. Principles of laboratory diagnosis of viral infections. Laboratory diagnosis of respiratory diseases:	1	2	3
8.	Laboratory diagnosis of respiratory tract infections: Rhinovirus, Influenza and parainfluenza virus, Respiratory syncytial virus, Adenovirus.	1	2	3
9.	Laboratory diagnosis of viral hepatitis and HIV / AIDS.	1	2	3
10.	Laboratory diagnosis of herpes infections and infections caused by enteroviruses.	1	2	3
11.	Sanitary microbiology. The tasks. Sanitary-microbiological analysis of water and air in dental offices.	1	2	3
12.	Cross infection in dentistry.	1	2	3
13.	Ecology of the oral cavity.	1	2	3
14.	Dental plaque and tartar. The role of microorganisms in the pathology of dental caries, periodontal disease. Endodontic and periapical infections.	1	2	3
15.	Oral and perioral infections.	1	2	3
		15	30	45
Total				90

**VI. REFERENCE OBJECTIVES AND CONTENTS UNITS**

Objectives	Content units
Chapter 1. Special Bacteriology	
<p>To know the morphobiological characters of pathogenic agents.</p> <p>To know the sources of infection and the mechanisms of transmission, pathogenesis and symptomatology of infectious diseases of bacterial etiology.</p> <p>The rules of harvesting and transportation of specimens</p> <p>To apply etiological investigation patterns in bacterial infections.</p> <p>Know the principles of prophylaxis and specific treatment of bacterial infections.</p>	<p>Etiological investigation of major infectious diseases of bacterial origin:</p> <ul style="list-style-type: none">• Infections caused by piogenic cocci• Zoonotic Infections• Anaerobic infections• Airborne infections• Spirochetosis• Intestinal infections• Infections caused by intracellular parasites <p>Particularities of harvesting samples. Etiological investigation of bacterial infections. Clinical and ethio-pathogenetic aspects. Laboratory diagnosis. Prophylaxis and specific treatment.</p>
Chapter 2. Special Virology	
<p>To know the taxonomic criteria for the classification of viruses.</p> <p>To know the mechanisms of viruses interaction with the host cell.</p> <p>To know the stages of replication of viruses in the host cell.</p> <p>To know the sources of infection and transmission mechanisms, pathogenesis and symptomatology of infectious diseases of viral etiology.</p> <p>To know the rules of harvesting of specimens</p> <p>To know application of the etiological investigation schemes in viral infections.</p> <p>To know the principles of prophylaxis and specific treatment of viral infections.</p>	<p>Etiological investigation of infectious diseases of viral origin:</p> <ul style="list-style-type: none">• Severe acute respiratory infections• Enterovirus infections• Infections caused by herpesviruses, retroviruses• Irradiated transvaginal infections. <p>The rules of harvesting and transportation of specimens</p> <p>Etiological investigation of viral infections. Clinical and ethio-pathogenetic aspects. Laboratory diagnosis. Prophylaxis and specific treatment.</p>
Chapter 5. Oral microbiology	
<p>Define the basics of oral and sanitary microbiology.</p> <p>To possess knowledge about microbiological control of water and air in dental offices and monitoring norms.</p> <p>To know the main microbiological agents involved in cross-infection in the dental office.</p> <p>To know methods of identifying the pathogenic and normal microbiota of the oral cavity.</p>	<p>Tasks of oral microbiology.</p> <p>Tasks of sanitary microbiology.</p> <p>The sanitary-indicator microorganisms of environment and the requirements to them.</p> <p>Normal microflora of the oral cavity and microflora in pathological processes.</p> <p>Etiopathogenesis of specific and non-specific processes of the oral cavity.</p> <p>Principles of laboratory diagnosis of infections of oral cavity.</p> <p>Principles of prophylaxis and specific treatment in oral infections..</p>



VII. PROFESSIONAL COMPETENCES (CS) AND TRANSVERSAL (CT) AND STUDY FINDINGS

Professional competencies (specific) (cs)

- CP 1. Use of basic knowledge and application of principles and methods for solving well-defined situation problems, typical of the field of oral microbiology;
- CP 2. To possess knowledge about the structure of the body, the physiological functions and the behavior of the human body in various physiological and pathological states, as well as the existing relationships between the state of health, the physical and the social environment.
- CP 3. Conducting scientific research in the medical field and other branches of science.
- CP 4. Promoting and ensuring the medicine and raising the professional level.

Cross-competences (ct)

- CT1. Self-government and responsibility in activity.

Study finalizations

Upon completion of the course the student will be able to:

- Possess skills to perform sampling for microbiological analysis.
- Possess microbiological techniques for analyzing the samples from oral cavity;
- Possess skills and competencies for formulating and reading the results obtained and applying them.
- Possess techniques for assessing the air quality in dental offices.
- Să cunoască metode de reducere a infecțiilor încrucișate.
- Possess techniques for quantitative and qualitative determination of specific and non-specific micro flora.

VIII. THE STUDENT'S INDIVIDUAL WORK

Nr.	The expected product	Implementation Strategies	Evaluation criterias	Deadline
1.	Work with information sources:	<p>Implementation Strategies</p> <p>Read the lecture or the material in the manual to the theme carefully. Read questions on the subject, which require a reflection on the subject.</p> <p>To get know with the list of additional information sources on the topic. Select the source of additional information for that theme.</p> <p>Reading the text entirely, carefully, and writing the essential content.</p>	Ability to extract the essentials; interpretative skills; the volume of work	During the semester



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		Wording of generalizations and conclusions regarding the importance of the subject.		
2.	Practical work with guidelines:	Until solving the tasks in the notebook to analyze the information and images from the respective subject from lectures and books. Solving the student's individual training tasks. Formulation of conclusions at the end of each laboratory. Verify the results and evaluate their achievement.	Workload, problem-solving, ability to formulate conclusions	End of semester
3.	Project	Initiate a study in a set direction.	The volume of work, the level of insight into the subject, the level of scientific argumentation, the quality of the conclusions, the elements of creativity, the demonstration of the understanding of the problem, the formation of the personal attitude	End of semester

IX. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-EVALUATION

Teaching methods used

- Exposing, interactive lecture, heuristic conversation, questioning, brainstorming, teamwork, individual study, work with manual and scientific text, debate, problem-solving, and interactive listening.

Recommended learning methods

- **Observation** - Identification of elements characteristic of the microbial cell, description of the structure elements of the microbial cell (permanent and non-permanent structural elements).
- **Analysis** - Imaginary decomposition of the whole into component parts. Highlighting the essential elements. Studying each individual element as a part of integrity.
- **Analysis of schema/figure** - Select the required information. Recognition based on knowledge and information selected structures indicated in the drawing, drawing. Analysis of the functions/role of recognized structures.
- **Comparison** - Analysis of the first object/process in a group and the determination of its essential features. Analysis of the second object/process and the determination of its essential features. Comparing objects/processes and highlighting common features. Comparing objects/processes and determining differences. Establishment criteria for decommissioning. Formulation of conclusions.
- **Classification** - Identification of structures/processes to be classified. Determining the criteria on which classification is to be made. Distribution of structures/processes by groups according



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to established criteria.

- **Schedule design** - Selection of elements, which must be included in the schema. Playing the Elements Selected by Different Symbols / Colors and Indicating Their Relationships. Wording of an appropriate title and legend of the symbols used.
- **Modeling** - Identify and select the elements needed to model the phenomenon. The imaging (graphical, schematic) of the phenomenon studied. Realizing the phenomenon using the developed model. Formulation of conclusions, deduced from arguments or findings.
- **Experiment** - Formulating a hypothesis, based on known facts, on the process / phenomenon studied. Verifying the hypothesis by performing the processes / phenomena studied under laboratory conditions. Formulation of conclusions, deduced from arguments or findings.

Methods of assessment (including an indication of how the final grade is calculated)

Current: front and / or individual control via

- (a) the application of docimological tests,
- (b) analysis of case studies
- (c) control work
- (d) the assessment of the workload of the individual tasks

Final: Exam

The final mark will consist of the average score from three control papers and the assessment from the individual work assessment (share 0.5), the final test sample (share 0.5).

The average annual mark and the marks of all the final exam stages (assisted by computer, test) - all will be expressed in numbers according to the scoring scale (according to the table), and the final mark obtained will be expressed in two decimal places to be passed in the notebook.

How to round up the grades at the evaluation steps

Intermediate note grid (annual average, grades from the exam stages).	National scoring system.	Equivalent ECTS
1,00-3,00	2	F
3,01-4,99	4	FX
5,00	5	E
5,01-5,50	5,5	
5,51-6,0	6	
6,01-6,50	6,5	D
6,51-7,00	7	
7,01-7,50	7,5	C
7,51-8,00	8	
8,01-8,50	8,5	
8,51-8,00	9	B
9,01-9,50	9,5	
9,51-10,0	10	A

The average annual mark and the scores of all the final examinations (computer-assisted, test, oral) - all will be expressed in numbers according to the scoring scale (according to the table), and the final grade obtained will be expressed in two decimal digits will be transferred to the notes book.



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Failure to attend the examination without good reason is recorded as "absent" and is equivalent to the 0 (zero) rating. The student is entitled to 2 repeated claims of the unsuccessful exam.

X. RECOMMENDED BIBLIOGRAPHY:

A. Mandatory:

1. Ananthanarayan R., Jayaram Paniker C. Textbook of microbiology. Orient longman, 2005.
2. Buiuc D., Bosnea D., Staduleanu C. Oral microbiology. Apollonia publishing house, Iași, 1999.
3. Galețchi P., Buiuc D., Plugaru Șt. Practical guide to medical microbiology. Chisinau, Bucharest, 1997.

B. Additional:

1. Bergey's Manual of Deterministic Bacteriology (ninth edition), 2001.
2. Jawetz, Melnick & Adelberg's. Medical Microbiology. Twenty-Second Edition, 2001.
3. Levinson W. Review of Medical Microbiology and Immunology, tenth edition. Mc Graw Hill LANGE, 2008.
4. Cappuccino JG., Sherman N. Microbiology and laboratory manual, 7th edition. Pearson Education, 2005.
5. Vorobyova A., Bykova A. Atlas on medical microbiology, virology and immunology. Moscow, 2005.