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MEDICAL UNIVERSITY - PLOVDIV
PHARMACEUTICAL FACULTY
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

ACADEMIC STANDARD
OF
MICROBIOLOGY
FOR
STUDENTS IN DENTAL MEDICINE

MEDICAL UNIVERSITY - PLOVDIV
PHARMACEUTICAL FACULTY
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

1. Objective of the course training

The main objective of the course in Microbiology is to acquaint the students of dental medicine with the morphological and biological characteristics of microorganisms in the oral area and other places in the human body, the patterns of development of the infectious process, the specific and non-specific immune protection of the organism, the basic methods of microbiology diagnostics of infectious diseases and inflammatory conditions, antibacterial preparations and mechanisms of resistance against them, means for prevention and control of infections in the oral cavity, and maxillofacial area.

The objective conforms to:

- the volume and credit rating of the discipline (ECTS system), evident from the syllabus available on the website of MU - Plovdiv
- the qualification characteristic of the specialty Dental Medicine
- the academic degree (Master's degree)

The objective corresponds to the place of microbiology as a discipline in the specialty Dental Medicine according to its importance and chronology in the overall curriculum. As a fundamental discipline, it supports and serves the next stages in the education of dental medicine students.

The priority goals of the University are: development of students' personal qualities, promotion of their initiative, creation of habits for permanent self-education and ability to learn on their own, acquisition of "transferable" knowledge, key competences and skills. This is reflected in the content of the Microbiology course.

2. Curriculum of the course in Microbiology:

The topics and hours of lectures, exercises, course assignments are listed on the web site of the department located on the website of MU - Plovdiv:

<http://mu-plovdiv.bg/fakulteti/farmatsevtichen/katedri/mikrobiologiya-imunologiya/> in the relevant subsection: Faculty of Pharmacy; students in dental medicine, as well as in Appendix 1.

The content is arranged chronologically so that each subsequent lecture and related exercises use already learned subject matter, concepts and terminology. The unnecessary clutter or the existence of "white spots" between "linked" disciplines is avoided.

The core objectives of the microbiology curriculum are:

- Acquaintance with the morphology, physiology and pathogenic factors of microorganisms that play a role in human pathology, in particular in oral and maxillofacial infections
- Study of the patterns for the emergence and course of infectious process, pathogenesis of infectious diseases and various forms of infection with an emphasis on those in the oral, maxillofacial and cervical regions
- Study of the mechanisms of protection of the macroorganism - natural resistance and acquired immunity with emphasis on those characteristic of the oral cavity and maxillofacial area, as well as the principles of immunoprophylaxis and immunotherapy of infectious diseases
- Antimicrobial chemotherapy - comprehension of the mechanisms of action of the main groups and representatives of antimicrobial agents, as well as the mechanisms for the development of bacterial resistance
- The principles and basic methods of sterilization and disinfection. Mechanisms of action and characteristics of disinfectants and antiseptics used in dental medicine;
- Acquiring microbiological diagnostics of infectious diseases; the structure and role of the microbiological laboratory for the etiological diagnosis of infectious diseases; skills for proper clinical interpretation and analysis of laboratory results;
- Study of the methods for microbiological, immunological and molecular biological diagnostics of infectious diseases, as well as the correct interpretation of the obtained results;
- Study of the composition and role of the normal microflora of the human body, with an emphasis on the microbiome in the oral region;
- Study of the role of the external environment in the spread of infectious agents and the methods and means of microbiological control of the environment.

3. Prerequisites

Dental students must have basic knowledge of biology and chemistry from their first year Medical University programs in order to begin and successfully complete their microbiology training.

4. Academic resources

The academic staff of the Department of Microbiology and Immunology includes 4 professors, 1 lecturer with a doctoral degree in relevant scientific specialty and 6 lecturers. Of all the lecturers 7 have acquired a specialty in Microbiology, 1 has a specialty in Immunology, and 1 in Virology. One lecturer is appointed to provide the training in the field of microbiology, and one - in immunology. Two of the professors also have a second Master's Degree in Health Management.

The lectures are delivered by lecturers who have obtained habilitation (professor or associate professor) with a PhD in the relevant doctoral program. Up to 30% of the lectures are assigned to lecturers who hold a PhD in the relevant doctoral program.

Practical exercises are conducted by professors and lecturers (assistant professors, senior assistant professors). The lecturers hold a Master's Degree in medicine and are appointed after a competition.

5. Material resources

The Department of Microbiology and Immunology of MU-Plovdiv has 4 (four) teaching laboratories, equipped with microscopes with specialized monitoring software, equipment for multimedia presentations and an interactive training system for students to illustrate the learning process. The total (laboratory) area of the department is 470.27 m². Of these, the laboratory premises are 141m². The department also has a museum collection with a collection of laboratory equipment and microscopes to assist with the study work as demonstration materials. The laboratory equipment of the department includes general equipment (laboratory scales, refrigerators, freezers, incl. low-temperature at 80 °C, thermostats, including CO₂ incubator, water baths, centrifuges, incl. high-speed, etc.) and specialized diagnostic equipment (flow cytometer, turbidimeter, nephelometer, immunofluorescence and inverter microscopes, PCR apparatus - 2 pieces, real-time PCR, multiplex PCR for specialized diagnostics and research on meningitis, intestinal, respiratory infections and sepsis, ELISA apparatus, incl. automated system, automated immunoblot, automated bacterial growth analyzer for body fluids, automated fluorimeter for viral marker detection).

6. Lecturing

Lectures are prepared and given in the form of multimedia presentations, which are handed out to dental students in electronic format. Lectures' content and format are chosen by the leading lecturer.

7. Laboratory classes

Practical classes are held separately for each group. Methodological guidelines, manuals and tests are provided. These tests check students' knowledge (results and skills) of the particular exercise. Discussions are held.

8. Information resources. Basic literature. Websites.

All lecturers shall prepare lectures, practicals, training tests, and other course materials in the discipline, which shall also be available in electronic format. A list of the main reference literature shall be presented, with a priority given to the available resources that are published as "basic literature". We also recommend internet resources where appropriate materials for the student's preparation can be found.

Student books:

1. Levinson W., Review of Medical Microbiology and Immunology, 14th ed, 2016, McGraw-Hill Education, ISBN: 978-0-07-184574-8.
2. Murray P., K. Rosenthal, M. Pfaller, Medical Microbiology, edition, 2016, ELSEVIER, ISBN: 978-323-29956-5.
3. Samaranayake L., Essential of Microbiology for Dentistry, 4th edition, 2012, reprinted 2016, CHURCHILL LIVINGSTONE Elsevier, ISBN: 9780702034848

Websites:

1. <https://www.ncbi.nlm.nih.gov/books/NBk7627/>
2. <http://www.textbookofbacteriology.net/>
3. Webpage of the Department of Microbiology and Immunology on the website of the Medical University of Plovdiv: <https://mu-plovdiv.bg/en/faculties/faculty-of-pharmacy/departments/department-of-microbiology-and-immunology/> microscopic preparations, nutrient media, some practical microbiology tests and lecture courses are available.

9. Control assignments

Students shall be occupied dynamically and intensively during the semester. It is assumed that the way in which knowledge and skills are acquired is an important factor for their depth, durability and applicability. Tutors shall control students' progress at least twice in the semester. Ongoing control can be performed through tests or control assignments. Students are provided with timely information and explanations on the control results, which assist their further preparation. The period during which the students have access to the examination tests and results is up to 3 (three) working days after their announcement. The results of these examinations are included as a component in the final semester grade.

10. Individual preparation and extracurricular work of the student

Individual work is guided by the lecturer (assistant professor), who guides the student in both literary sources and methods of their studying. They also provide sample training tests, incl. on line, for independent work and training of the students. Very helpful in that respect is the developed electronic version of microscopic preparations, nutrient media and some practical tests in microbiology, available on the webpage of the department on the website of MU - Plovdiv.

11. Cooperation between lecturers and students. This cooperation is expressed in:

- Lecturers' commitment to the student and his / her preliminary preparation, current difficulties in learning the material and opportunities to achieve more with an individual learning program.
- Use of consultation hours on a pre-approved schedule.
- Involvement of students in teams of scientific tasks, research, projects, extracurricular activities, etc.

12. Exams

1. The current assessments provided in the specialty curriculum shall be given for:

- The student's results in laboratory and / or practical exercises, individual assignments, student's work with the research and project tutor, etc.

At least two (one in the middle and one at the end of the semester) written tests or student's projects.

2. The semester exam consists of 3 components:

- 30 minutes anonymous entry test; only students with a minimum of 60% correct answers are admitted to the written exam
- Written exam (anonymous for the above mentioned) lasting 1 hour and 30 minutes; two written exam topics are drawn out and the students have the right to choose one.
- interview (final stage of the exam), conducted on the schedule for the day.

A committee composed of the examiner and two assistants decides the final grade. The major part of the grade is composed by the written exam, but the perseverance of the student reflected in the current semester assessment is also important.

13. Standards of evaluation:

The standards for assessing the achievements of the dental students are carefully considered and defined so as to objectify the students' evaluations, which shall not depend on the subjectivity of the examiners.

Based on the above, the standards for evaluation are described as follows:

- **Excellent (6)** – for shown individual and logical thinking, additional knowledge and skills, for excellent knowledge of the subject, creativity, interpretation of the concepts, skills to solve complex tasks and right argumentation for the decisions taken, accuracy and rich language culture of the presentation.
- **Very good (5)** – for well-developed key and additional knowledge, thinking and understanding the subject, good skills to apply the knowledge, adequate use of scientific concepts from the studied field, good language culture.
- **Good (4)** – for developed additional knowledge, good knowledge of the subject; but without being able to develop learning to analysis; comparatively good language culture; but with inaccuracies in the use of different concepts and terms.
- **Satisfactory (3)** – simple reproduction and key knowledge of the subject; not ready for analysis of the knowledge gained; poor language culture with a lot of mistakes.
- **Poor (2)** – for showing scant knowledge and gross errors that cannot be the basis for the next levels of training.

At the beginning of the Microbiology course each semester the students must be informed about the evaluation standards, the procedures for conducting the ongoing control and the opportunities for obtaining a feedback on their progress during the semester.

14. Final grade formation

The final grade determines the extent to which the student has achieved the learning objective set at the beginning of the course. It is multi-component and includes a written final exam and at least one of the following components:

1. current control assessment (s);
2. final oral examination;
3. final practical examination;

Other possible components are:

4. the evaluation of laboratory and / or practical exercises during the semester;
5. assessment of the of research and projects made with the lecturer in the discipline.

For each component participating in the final evaluation, a coefficient of significance (from 0 to 1) is determined, the total sum of the coefficients must always be 1. The final rating is obtained as the sum of the six-point scores from the various components, multiplied by the corresponding coefficients of significance.

Q final mark = K1 Q mark from current control + K2 mark from written exam + K3 Q mark from oral exam

K1 = 0.20; K2 = 0.30; K3 = 0.30

If one of the components of the final grade is weak 2, then the final grade is necessarily poor 2.

The components involved in forming the grade and the coefficients of significance for each discipline are determined by the Academic Board with the adoption of the present Academic Standard of the discipline.

In the semester exam the students' written works are evaluated anonymously. The examination materials in Microbiology are stored and the students are given the opportunity to get acquainted with them and the grounds for assessment in order and procedure announced in advance. The periods during which students have access to the examination materials and results shall not exceed 5 working days after the date of the examination.

The description of the Microbiology course in this present form shall be given to the student at the beginning of the course.

This requirement is set in accordance with the ZVO Art. 56. section 1, "Lecturers are obliged to develop and publicize, in an appropriate manner, a description of the lecture course they provide, including the titles and sequence of the topics of the course content, reference literature, the method of evaluation and the form of assessment of knowledge and skills."

15. Documentation, storage of results and control of evaluation activities

- Assessed students have the right and obligation to be informed of the regulations, procedures and results of assessment, to make claims and complaints in the event of non-compliance with these rules.
- The student's right within the meaning of the preceding paragraph shall be valid in the case of technical deficiencies or errors (e.g. in calculating or drawing up the grades), as well as on serious grounds for discrepancy between the actual knowledge, skills and competences shown and the final evaluation for them.
- Corrections of the grades in the cases referred to in the previous paragraph shall be made in the student's book, examination report or in the main register only by the discipline holder.

- Possible disputes and claims on the part of the students are addressed in writing to the assessment team, who should give a reasoned answer by the end of the next business day.
- Established and proven cases of a serious violation of the student's rights in assessing his / her knowledge, skills and competences shall be addressed as a written complaint to the Vice-Rector for Quality and Accreditation.

The academic standard for the discipline Microbiology was approved by Decision of the Academic Board – Report No. 9 / 26.11.2015 and published on the website of the MU - Plovdiv.

Approved by:

Head of Department

/Prof. Marianna Murdjeva, MD, PhD, FIMM/

