



Microbiology and oral microbiology

| 1. IMPRINT | |
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| Academic Year | 2024/2025 |
| Department | Faculty of Dental Medicine |
| Field of study / Subject | English Dentistry Division |
| Main scientific discipline | Medical sciences |
| Study Profile | General academic |
| Level of studies | Uniform MSc |
| Form of studies | Full-time studies |
| Type of module / course | Obligatory |
| Form of verification of learning outcomes | Exam |
| Educational Unit / Educational Units | Department of Dental Microbiology 1a Banacha, 02-097 Warszawa phone (22) 317 95 10 |

**Załącznik nr 4A do Procedury opracowywania i okresowego przeglądu programów studiów
(stanowiącej załącznik do zarządzenia nr 68/2024 Rektora WUM z dnia 18 kwietnia 2024.)**

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| Head of Educational Unit / Heads of Educational Units | dr hab. n. med. Edyta Podsiadły |
| Course coordinator | dr hab. n. med. Edyta Podsiadły edyta.podsiadly@wum.edu.pl phone (22) 628 27 39 |
| Person responsible for syllabus | dr hab. n. med. Edyta Podsiadły edyta.podsiadly@wum.edu.pl (mgr Adam Szeleszczuk) |
| Teachers | dr hab. n. med. Edyta Podsiadły edyta.podsiadly@wum.edu.pl (mgr Adam Szeleszczuk) (dr n. med. Dominika Lachowicz) |

2. BASIC INFORMATION

| | | | |
|---|----------------------------|-------------------------------|---------------------------------|
| Year and semester of studies | II year, I and II semester | Number of ECTS credits | 5 |
| FORMS OF CLASSES | | Number of hours | ECTS credits calculation |
| Contacting hours with academic teacher | | | |
| Lecture (L) | 10 | 0,4 | |
| Seminar (S) | 15 | 0,6 | |
| Discussions (D) | - | - | |
| e-learning (e-L) | - | - | |
| Practical classes (PC) | 45 | 1,8 | |
| Work placement (WP) | - | - | |
| Unassisted student's work | | | |
| Preparation for classes and completions | 55 | 2,2 | |

3. COURSE OBJECTIVES

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| O1 | Student learns about the basic characteristics of microorganisms pathogenic for humans, laboratory diagnostic methods and the principles of sterilisation and disinfection in dental practice |
| O2 | Student learns about physiological microflora of the oral cavity, etiology and pathogenesis of dental caries, microbiology of periodontal disease, systemic odontogenic infections |
| O3 | Student learns about pathogenesis and epidemiology of infectious diseases and defence mechanisms of the host (specific and nonspecific) |

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| O4 | Student learns about chemotherapy of bacterial, fungal and viral infections, control of infections in dental practice and prophylaxis of infectious diseases |
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4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING

| Code and number of effect of learning in accordance with standards of learning | Effects in time |
|--|-----------------|
|--|-----------------|

Knowledge – Graduate* knows and understands:

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|--------|--|
| C.W1. | types and species as well as structure of viruses, bacteria, fungi and parasites, their biological features and mechanisms of pathogenicity |
| C.W2. | physiological human bacterial flora |
| C.W3. | basics of epidemiology of viral and bacterial infections, fungal and parasitic infections and the ways of their transmission in the human body |
| C.W4. | species of bacteria, viruses and fungi which are the most common etiological factors of infections |
| C.W5. | principles of disinfection, sterilization and aseptic procedures |
| C.W6. | external and internal pathogens |
| C.W9. | the phenomenon of drug resistance |
| C.W20. | principles of treatment of viral, bacterial, fungal and parasitic infections |
| E.W9. | the principles of immunisation against infectious diseases in children and adults |
| F.W3. | viral, bacterial and fungal flora of the oral cavity and its importance |
| F.W13. | principles of antibiotic therapy and antibiotic resistance |

Skills– Graduate* is able to:

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| C.U1. | collect an appropriately selected type of biological material for microbiological testing depending on the location and course of the infection |
| C.U2. | interpret the results of microbiological, serological and antibiogram tests |
| C.U3. | select and perform tests indicating the number of bacteria in body fluids |
| F.U14. | assess the risk of caries using bacteriological tests and saliva tests |

| 5. ADDITIONAL EFFECTS OF LEARNING | |
|---|------------------------------------|
| Number of effect of learning | Effects of learning in time |
| Knowledge – Graduate knows and understands: | |
| K1 | - |
| Skills – Graduate is able to: | |
| S1 | - |
| Social Competencies – Graduate is ready for: | |
| SC1 | - |

| 6. CLASSES | | |
|----------------------|--|----------------------------|
| Form of class | Class contents | Effects of Learning |
| Lectures (L) | | |
| Lecture 1 and 2 | L1,2– Lecture 1 and 2 – Genera and species of bacteria, their structure, biological characteristics and mechanism of pathogenicity. | C.W3., C.W6. |
| Lecture 3 and 4 | L3,4– Lecture 3 and 4 – Antibiotics relevant in dentistry – classification, natural resistance, susceptibility of selected groups of microorganisms, mechanisms of resistance. | C.W1., C.W4. |
| Lecture 5 and 6 | L5,6 – Lecture 5 and 6 – Genera, species and structure of fungi, their biological characteristics, antimycotics. | C.W1.C.W4. |
| Lecture 7 and 8 | L7,8 – Lecture 7 and 8 – General characteristics of viruses. Structure of viruses. Phases of viral replication. Characteristics of the stages of viral infections. Defense mechanisms of viruses. Definitions related to the course of viral infections. DNA / RNA viruses. Pathogenesis and epidemiology of viral infections. Factors of viral pathogenesis. Groups of antiviral drugs. Characterization of prions as disease agents. | C.W1., C.W6., C.U2. |
| Lecture 9 and 10 | L9,10 – Lecture 9 and 10 – Exogenous and endogenous infections in patients. Pathogens most commonly causing dental infections in immunocompromised patients. Characteristics of pathogens causing new and relapsing infections. | C.W6 |
| Seminars (S) | | |
| Seminar 1 | S1 – Seminar 1 – Passive and active prophylaxis of viral and bacterial infections. Types of vaccines used in prophylaxis against infections. Obligatory and recommended vaccines. Characteristics of preparations used for immunization against viral infections | E.W.9 |
| Seminar 2 | S2 – Seminar 2 – 2a. The physiological flora of the oral cavity. Physiological niches in oral cavity. Species composition of biofilms inhabiting particular microenvironments. Characteristics of species | C.W2., F.W3. |

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| | <p>included in the oral microbiome. Age-dependent changes in microbiota composition.</p> <p>2b. Etiology and pathogenesis of dental caries.</p> <p>Causes of the formation of carious lesions. Characteristics of microbial species important in the formation of carious lesions. Types of caries.</p> <p>Prevention of the formation and progression of carious lesions.</p> | F.W3., F.U14. |
| Seminar 3 | <p>S3 – Seminar 3 – 3a. Microbiology of periodontal diseases. Division of periodontal and gingival diseases. Characterization of microorganisms relevant in the development of periodontal diseases. Bacterial complexes in the subgingival biofilm. Pathomechanism of periodontal diseases. Microbiological diagnosis and treatment guidelines.</p> <p>3b. Systemic odontogenic infections.</p> <p>Definition of odontogenic infection. Types of infections associated with diseases of teeth and gums. Characteristics of systemic odontogenic infections.</p> | <p>C.W2., F.W3.</p> <p>C.W2., F.W3.</p> |
| Seminar 4 | S4 – Seminar 4- Chemotherapy of bacterial infections in dental treatment. | C.W20., F.W13., C.U2 |
| Seminar 5 | S5 - Seminar 5 – Definitions related to epidemiology of infections. Routes of transmission of bacterial infections. Factors of bacterial pathogenesis. Systemic infections in dental practice - epidemiology and diagnosis. Infections associated with dental practice. Routes of transmission of infections. Infection control in dental practice | C.W3 |
| Practical classes (PC) | | |
| Practical classes 1 | <p>PC1 - Principles of bacteriological diagnostics. Methods of isolation and identification of bacteria.</p> <p>Basic safety rules in the microbiology laboratory. Techniques of staining bacteria. Methods of culture and identification of bacteria.</p> | C.W6., C.U1., C.U2., C.U3. |
| Practical classes 2 | <p>PC2 - Sterilisation and disinfection. Hand hygiene of the medical personnel.</p> <p>Methods of sterilization and disinfection of medical equipment, instruments and rooms. Control of sterilization and disinfection processes. Proper hand hygiene.</p> | C.W3., C.W5. |
| Practical classes 3 | <p>PC3 - Gram-positive bacteria</p> <p>Characteristics of microorganisms belonging to Gram-positive bacteria. Methods of laboratory diagnostics of clinically relevant species.</p> <p>Microaerophilic and capnophilic bacteria, <i>Corynebacterium</i>, <i>Listeria spp.</i></p> | C.W1., C.W4., C.U2., C.U3. |
| Practical classes 4 | <p>PC4 - Gram-negative bacteria.</p> <p>Characteristics of species belonging to aerobic fermenting and non-fermenting bacilli - epidemiology and diagnostics. Microaerophilic and capnophilic bacteria.</p> | C.W1., C.W4., C.U2. |
| Practical classes 5 | <p>PC5 – Atypical bacteria. Basic serological methods applied in microbiology.</p> <p>Methods of laboratory diagnosis of infections caused by spirochaete, rickettsiae, mycoplasmas and chlamydiae</p> | C.W1., C.W4., C.U2. |
| Practical classes 6 | <p>PC6 - Anaerobic bacteria clinically relevant in dental practice.</p> <p>Division and characteristics of clinically relevant anaerobic bacteria. Infections caused by anaerobes.</p> | C.W1., C.W4., C.U2. |

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| Practical classes 7 | PC7 - Chemotherapy of bacterial infections in dentistry. Methods of assessing susceptibility to antimicrobial drugs. Mechanisms of bacterial resistance to antibiotics. Alert strains. | C.W9., C.W20., F.W13., C.U2. |
| Practical classes 8 | PC8 - Bacteria of the genera <i>Mycobacterium</i> Systematics of bacteria of the genera <i>Mycobacterium</i> . Epidemiology, diagnosis and treatment of <i>Mycobacterium</i> infections. | C.W1., C.W4., C.U2. |
| Practical classes 9 | PC9 - Fungal infections including infections of the oral cavity. Characteristics of clinically relevant fungal species. Antifungal drugs. Epidemiology, diagnosis, and treatment of infections. | C.W1., C.W3., C.W4., C.U1. |
| Practical classes 10 | PC10 – Laboratory diagnostics of viral infections. General properties of viruses. Methods of culture of viruses. Methods used to multiply and isolate viruses. HIV/AIDS infection. Viral hepatitis (HBV, HCV) in dental practice. Laboratory diagnosis of HIV infection. Therapeutic possibilities and prevention of HIV infections. Viruses relevant in dentistry. | C.W1., C.W6., C.U2. |
| Practical classes 11 | PC11 – Respiratory-transmitted viral and bacterial infections – characteristics of microorganisms causing respiratory-transmitted infections, epidemiology, laboratory diagnostics, treatment and prevention. | C.W1., C.W4., C.U2. |
| Practical classes 12 | PC12 – Cardiovascular and nervous system infections: etiological factors, diagnosis, treatment. | C.W1., C.W4., C.U2. |
| Practical classes 13 | PC13 – Gastrointestinal system infections: etiological factors, diagnosis, treatment. Osteoarticular system infections: etiological factors, diagnosis, treatment. Urinary system infections: etiological factors, diagnosis, treatment. | C.W1., C.W4., C.W6. |
| Practical classes 14/15 | PC 14/15 - Review of the course. Credit for practical classes. | C.W1.- C.W20., E.W9., F.W3., F.W13., C.U1.- C.U3., F.U14. |

7. LITERATURE

Obligatory

1. Essential Microbiology for Dentistry. L. P. Samaranayake. Elsevier, 6th edition, 2024.

Supplementary

1. Medical Microbiology. P. R. Murray, K. S. Rosenthal, M. A. Pfaller. Elsevier, 9th edition, 2020.
2. Review of Medical Microbiology and Immunology. Ed. W. Levinson. Lange, 16th edition, 2020.
3. Human virology. L. Collier, P. Kellam, J. Oxford. Oxford University Press, 5th edition, 2016.

8. VERIFYING THE EFFECT OF LEARNING

| Code of the course effect of learning | Ways of verifying the effect of learning | Completion criterion |
|---|---|---|
| C.W1.- C.W6., C.W9., C.W20., E.W9., F.W3., F.W13., C.U1.- C.U3., F.U14. | 1. Intermediate tests (4 tests during the course) | 1. Threshold number of points: 11/20 Scores and marks: <11,0/20 – 2.0 (failed) 11,0-12,0/20 – 3.0 (satisfactory) |

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| | <p>2. Credit for practical classes.</p> <p>3. Final exam (80 MCQ), single choice, 1 correct answer.</p> | <p>13,0-14,0/20 – 3.5 (more than satisfactory) 15,0-16,0/20 – 4.0 (good) 17,0-18,0/20 – 4.5 (more than good) 19,0-20,0/20 – 5.0 (very good)</p> <p>2. Credit</p> <p>3. Threshold number of points: 56/100 Scores and marks: <45/80- 2,0 (failed) 46-51/80 - 3,0 satisfactory 52-58/80 - 3,5 (more than satisfactory) 59-65/80 - 4,0 (good) 66-73/80 - 4,5 (more than good) 74-80/80 - 5,0 (very good)</p> |
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9. ADDITIONAL INFORMATION

1. Person responsible for teaching: dr hab. n. med. Edyta Podsiadły, tel. (22) 3179521
2. Prerequisite for passing the course is participation in all of the seminars and practical classes. Only one unexcused absence is possible, credited with a paper within a week of absence.
3. Each student is obliged to prepare and deliver 1 (one) presentation/paper during a seminar with a designated topic of the seminars.
4. Student can take each colloquium only once – one first term colloquium, one re-take colloquium.
5. Exam can be taken by students who passed all the colloquia and the credit for practical classes only.
6. The final exam can be taken before session.
7. Exam – first term, re-take exam, commission exam, each term can be taken only once.
8. Practical classes are held in the rooms of the Department of Physiology and Experimental Pathophysiology, 3C Pawińskiego or in the rooms of the Department of Dental Microbiology and Department of Pharmaceutical Microbiology and Biostructure.
9. On-site lectures are held in the auditorium of the University Center of Dentistry, 6 Bienieckiego.
10. Seminars are held in the seminar rooms, 3C Pawińskiego.

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ATTENTION

The final 10 minutes of the last class in the block/semester/year should be allocated to students' Survey of Evaluation of Classes and Academic Teachers