

DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY / Faculty of Medicine, University of Banja Luka

| School year | Subject | Subject code | Study Program | Cycle Studies | Year of Study | Semester | Number of students | Number of exercise groups |
|-------------|------------------------------------|--------------|-----------------|------------------|---------------|----------------|--------------------|---------------------------|
| 2024/2025. | Microbiology and Immunology | | Medicine | Integrated study | Second year | III + IV (3+2) | 65 | 3 |

LECTURE PLAN AND SCHEDULE

| Week | Lesson | Subject | Day | Date | Time | Place | Hours | Lecturer |
|------|--------|--|---------|-------------|-------------|--------------------------|-------|--------------------------------|
| I | L1 | Introduction to microbiology. Taxonomy and classification of bacteria. Structure, biosynthesis and function of the bacterial cell (structure of the bacterial cell envelope, capsule, flagella and pili, bacterial spores) | Tuesday | 15.10.2024. | 15.00-17.15 | Amphitheater of the FPS* | 3 | Prof. Miroslav Petković, M.D. |
| II | L2 | Characteristics of bacterial genomes and mechanisms for the exchange of bacterial genetic material: transformation, conjugation, transduction. Bacterial virulence factors (adherence factors, invasiveness factors, bacterial toxins) | Tuesday | 22.10.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Aleksandra Šmitran, M.D. |
| III | L3 | Mechanisms of antibacterial action of antibiotics and chemotherapeutics. Mechanisms of bacterial resistance to antibiotics and chemotherapeutics | Tuesday | 29.10.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Maja Travar, M.D. |
| IV | L4 | Properties of innate immunity. Recognition of microorganisms by cells of innate immunity. Components of innate immunity, cellular (macrophages, NK cells) and humoral. The role of innate immunity in stimulating the acquired immune response. Antigens: types and properties. Principles of antigen recognition by T- and B-lymphocytes. Antigen-presenting cells. The major histocompatibility complex (MHC). Structure and function of MHC molecules. Processing and presentation of protein antigens. Antigen receptors on lymphocytes. The development of the immune repertoire and the emergence of different antigenic receptors. Maturation and selection of T-lymphocytes. Maturation and selection of B-lymphocytes | Tuesday | 05.11.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Miroslav Petković, M.D. |
| V | L5 | Antigen recognition and activation of naïve T-lymphocytes. Executive functions of helper CD4+ T-lymphocytes (role of Th1, Th2 and Th17 cells in the immune response). Executive functions of cytotoxic CD8+ T-lymphocytes. B-lymphocytes: activation, differentiation and effector functions. Humoral response to T-independent and T-dependent antigens. Executive functions of antibodies. Functions of antibodies in special anatomical sites (mucosal and neonatal immunity) | Tuesday | 12.11.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Aleksandra Šmitran, M.D. |
| VI | L6 | Hypersensitivity type I, II, III and IV. Immunological tolerance. Central and peripheral tolerance of T- and B-lymphocytes. Autoimmunity: principles and pathogenesis. Induction of immune response to transplanted tissues and mechanisms of graft rejection. Prevention and treatment of graft rejection. Immune response to tumors. Immune mechanisms of tumor rejection. Immunological approaches in the therapy of malignant tumors | Tuesday | 19.11.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Maja Travar, M.D. |
| VII | L7 | Basic defense mechanisms against intracellular and extracellular bacterial infections. Basic defense mechanisms against viral, fungal and parasitic infections. Principles of immunoprophylaxis of infectious diseases. Primary (congenital) immunodeficiencies. Secondary (acquired) immunodeficiencies | Tuesday | 26.11.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Miroslav Petković, M.D. |
| VIII | L8 | General characteristics of bacteria of the genus <i>Staphylococcus</i> . Characteristics and medical significance of the bacterium <i>Staphylococcus aureus</i> . General characteristics of bacteria of the genus <i>Streptococcus</i> . Properties and medical significance of <i>Streptococcus pyogenes</i> and <i>Streptococcus agalactiae</i> bacteria. Characteristics and medical significance of the bacterium <i>Streptococcus pneumoniae</i> . General properties and medical importance of genus <i>Enterococcus</i> | Tuesday | 3.12.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Aleksandra Šmitran, M.D. |

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| IX | L9 | General properties of bacteria of the genus <i>Neisseria</i> ; properties and medical significance of the bacteria <i>Neisseria gonorrhoeae</i> and <i>Neisseria meningitidis</i> . Characteristics and medical importance of <i>Haemophilus influenzae</i> bacteria. Bacterial vaccines (principles of vaccine production; bacterial antigens in vaccines; bacterial vaccines in use) | Tuesday | 10.12.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Maja Travar, M.D. |
| X | L10 | General characteristics of <i>Enterobacteriaceae</i> bacteria. Properties and medical importance of bacteria of the genera <i>Salmonella</i> and <i>Shigella</i> . Properties and medical importance of bacteria of the genus <i>Yersinia</i> and the species <i>Yersinia pestis</i> and <i>Yersinia enterocolitica</i> | Tuesday | 17.12.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Miroslav Petković, M.D. |
| XI | L11 | General properties of bacteria of the genus <i>Mycobacterium</i> ; properties and medical importance of <i>Mycobacterium tuberculosis</i> complex bacteria. Characteristics and medical significance of the bacterium <i>Mycobacterium leprae</i> and opportunistic mycobacteria. General properties of bacteria of the genus <i>Corynebacterium</i> ; properties and medical importance of <i>Corynebacterium diphtheriae</i> and diphtheroid bacteria | Tuesday | 24.12.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Aleksandra Šmitran, M.D. |
| XII | L12 | General properties of bacteria of the genus <i>Bacillus</i> ; properties and medical importance of <i>Bacillus anthracis</i> and <i>Bacillus cereus</i> bacteria. General properties of bacteria of the genus <i>Clostridium</i> ; properties and medical significance of <i>Clostridioides difficile</i> , <i>Clostridium perfringens</i> and other clostridial myonecrosis-causing bacteria. Properties and medical importance of <i>Clostridium tetani</i> and <i>Clostridium botulinum</i> bacteria | Tuesday | 31.12.2024. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Maja Travar, M.D. |
| XIII | L13 | Properties and medical importance of <i>Bordetella pertussis</i> bacteria. Characteristics and medical importance of <i>Legionella pneumophila</i> bacteria. General characteristics and medical significance of the bacteria <i>Vibrio cholerae</i> , <i>Campylobacter jejuni</i> and <i>Helicobacter pylori</i> | Tuesday | 07.1.2025. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Miroslav Petković, M.D. |
| XIV | L14 | General properties and medical importance of spiral bacteria; properties and medical importance of <i>Borrelia burgdorferi</i> and <i>Leptospira interrogans</i> bacteria. Characteristics and medical significance of the bacterium <i>Treponema pallidum</i> | Tuesday | 14.1.2025. | 15.00-17.15 | Amphitheater of the FPS | 3 | Prof. Aleksandra Šmitran, M.D. |

*FPS: Faculty of Political Science

PLAN AND SCHEDULE OF EXERCISES

| Week | Exercises | Subject | Day | Date | Time | Place | Hours | Lecturer |
|------|-----------|---|---------|----------------------------|---|-------|-------|---|
| I | E1 | Work in a microbiological laboratory. Microscope and microscopy. Microscopic preparations. Preparation of the native preparation. Simple staining. | Tuesday | 14.10.2024. 16.10.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| II | E2 | Taking samples for bacteriological examination (examination of samples by organ systems; instructions for taking samples of the greatest importance in clinical practice). Sending samples for bacteriological examination (guidelines for packaging and labeling of samples; filling in referrals for the bacteriological laboratory). Microscopic presentation of the morphological and functional structures of a bacterial cell (microscopic examination of native preparations; microscopic examination of preparations stained by simple staining and differential Gram staining). | Tuesday | 21.10.2024. 23.10.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| III | E3 | Methods for isolating bacteria (nutrient media and conditions for cultivating bacteria in vitro; seeding nutrient media). Recognition of isolated bacterial culture (examination of microscopic, cultural and physiological-biochemical properties). | Tuesday | 28.10.2024. 30.10.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| IV | E3 | Methods for testing the sensitivity of bacteria to antibiotics and chemotherapeutics (creation and guidelines for the interpretation of disc diffusion and broth dilution antibiogram methods. E-test). | Tuesday | 4.11.2024. 6.11.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| V | E5 | Bacteriological diagnostics of infections caused by bacteria of the genera <i>Streptococcus</i> and <i>Enterococcus</i> (recognition of bacterial isolates by examination of microscopic, cultural and physiological-biochemical properties). | Tuesday | 11.11.2024. 13.11.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| VI | E6 | Bacteriological diagnosis of infections caused by bacteria of the genus <i>Staphylococcus</i> (identification of bacterial isolates by examination of microscopic, cultural and physiological-biochemical properties). | Tuesday | 18.11.2024. 20.11.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| VII | E7 | Bacteriological diagnosis of infections caused by bacteria of the genera <i>Haemophilus</i> and <i>Neisseria</i> (recognition of isolates of bacteria of the genera by examination of microscopic, cultural and physiological-biochemical properties). | Tuesday | 25.11.2024. 27.11.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| VIII | E8 | Bacteriological diagnosis of infections caused by bacteria from the <i>Enterobacteriaceae</i> family. | Tuesday | 2.12.2024. 4.12.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| IX | E9 | Basic principles of bacteriological diagnosis of infections caused by bacteria of the genus <i>Mycobacterium</i> and <i>Corynebacterium</i> (isolation and microscopic recognition of bacteria stained Ziehl-Neelsen and Neisser) | Tuesday | 9.12.2024. 11.12.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| X | E10 | Basic principles of bacteriological diagnosis of infections caused by anaerobic sporogenous and asporogenous bacteria (specificities of taking and sending samples; conditions for cultivation and recognition of anaerobic bacteria; microscopic display of bacterial spores). | Tuesday | 16.12.2024. 18.12.2024. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |

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| XI | E11 | Basic principles of bacteriological diagnosis of infections caused by strictly intracellular bacteria. | Tuesday | 23.12.2024. 25.12.2024 | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| XII | E12 | Bacteriological diagnosis of infections caused by Gram-negative non-fermentative bacteria (identification of isolates by examination of microscopic, cultural and physiological-biochemical properties). | Tuesday | 30.12.2024. 1.1.2025. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| XIII | E13 | Serological diagnosis of bacterial infections (ELISA). | Tuesday | 6.1.2025. 8.1.2025. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |
| XIV | E14 | Molecular diagnosis of bacterial infections (RT-PCR) | Tuesday | 13.1.2025. 15.1.2025. | 8:00-11:00 11:00-13:00 8:00-11:00 | ERD | 3 | Ivana Todorović, M. D., Ljiljana Božić, D.M.D. |

ERD* - Exercise room of the department

HEAD OF THE DEPARTMENT:

Prof. dr Miroslav Petković