

**SYLLABUS OF PRACTICALS FOR 2nd YEAR STUDENTS OF GENERAL MEDICINE,  
SUMMER SEMESTER, ACADEMIC YEAR 2023/2024 MICROBIOLOGY 1**

**Practical exercise No. 1**

**February 26-March 1, 2024**

**Introduction and basic information. Collection and transport of material for microbiological examination.**

Introduction and organizational instructions.

Safety rules for work in the clinical microbiology laboratory.

Equipment of the clinical microbiology laboratory.

Basic algorithm of direct and indirect microbiological diagnostics.

Collection and transport of material for microbiological diagnosis.

**Practical exercise No. 2**

**March 4-8 2024**

**Microscopic examination of clinical samples.**

Native preparation. Fixed preparation.

Monochromatic dyeing. Diagnostic staining.

Types of regularly microscopied clinical specimens and the information that provides microscopic examination.

**Practical exercise No. 3**

**March 11-15, 2024**

**Cultivation examination of clinical samples.**

Basic principles of culture diagnostics in clinical microbiology laboratories.

Cultivation media. Liquid, semi-liquid and solid cultivation media. Basic, enriched, selective and diagnostic culture media.

Bacterial cultivation conditions. Aerobic, anaerobic and microaerophilic cultivation. Cultivation at increased CO<sub>2</sub> tension.

Culture evaluation and information provided by culture diagnostics.

Bacteria that are not cultivable on laboratory culture media.

**Practical exercise No. 4**

**March 18-22, 2024**

**Identification of bacteria.**

Identification of bacteria after cultivation - microscopic and biochemical; serotyping of bacteria.

Identification by mass spectrometry analysis (MALDI-TOF MS).

Identification by genome analysis (gene probes, PCR, sequencing).

**Practical Exercise No. 5**

**March 25-27, April 4-5, 2024**

**Bacterial susceptibility testing to antimicrobial drugs.**

Determination of susceptibility by qualitative disk diffusion test.

Determination of minimum inhibitory concentrations (MIC) and minimum bactericidal concentrations (MBC) of antimicrobial drugs by quantitative dilution test (agar, broth, microdilution broth test, MIDITECH test and E-test).

Detection of resistance mechanisms and genetic determinants of resistance.

**Practical exercise No. 6**

**April 8-12, 2024**

**Indirect microbiological diagnostics.**

Collection of material for proof of antibodies.

Proof of antibodies against the causative agent of infection by immunochemical methods - agglutination, precipitation, immunochromatographic test, ELISA test and immunofluorescence test. Confirmation of the ELISA-test result using Western-blot.

Options for quantification of antibodies.

Interpretation of tests for evidence of antibodies.

Proof of cellular immunity - IGRA tests.

**Written examination (Test No. 1)**

**Practical exercise No. 7**

**April 15-19, 2024**

**Basic algorithm for identification of grampositive bacteria, most often isolated from clinical samples.**

Laboratory diagnostics of infections caused by staphylococci, streptococci and enterococci.

**Practical exercise No. 8**

**April 22-26, 2024**

**Basic algorithm for identification of gramnegative bacteria that can be stained according to Gram, most often isolated from clinical samples.**

Laboratory diagnostics of infections caused by bacteria from order Enterobacteriales and gramnegative non-fermenting bacteria.

**Practical exercise No. 9**

**April 29-May 3, 2024**

**Microbiological diagnostics of infections caused by growing fastidious and non-cultivable bacteria.**

Laboratory diagnostics of infections caused by neisseria, hemophili, mycoplasma and chlamydia.

**Practical exercise No. 10**

**May 6-10, 2024**

**Microbiological diagnostics of the causative agents of viral infections.**

Basic principles of laboratory diagnosis of viral infections.

**Practical exercise No. 11**

**May 13-17, 2024**

**General and special mycology.**

Basic principles of laboratory diagnosis of fungal infections.

**Practical exercise No. 12**

**May 20-24, 2024**

**General and special parasitology.**

Basic principles of laboratory diagnostics of parasitic diseases.

Laboratory diagnostics of parasitic protozoa and worms.

**Written examination (Test No. 2).**

