Medicinski fakultet u Rijeci

IZVEDBENI NASTAVNI PLAN
2026/2027

Za kolegij

Medical Microbiology and Parasitology

Studij:	**Medical Studies in English (R)** Sveučilišni integrirani prijediplomski i diplomski studij
Katedra:	**Zavod za mikrobiologiju i parazitologiju**
Nositelj kolegija:	**prof. dr. sc. Šantić Marina, dipl. sanit. ing.**
Godina studija:	**3**
ECTS:	**8**
Stimulativni ECTS:	**0 (0.00%)**
Strani jezik:	**Mogućnost izvođenja na stranom jeziku**

Podaci o kolegiju:

Course of **Medical Microbiology and Parasitology** is a compulsory course in the 3rd year of the Integrated Undergraduate and Graduate University Study of Medicine, which is carried out through 30 hours of lectures, 30 hours of seminars and 30 hours of laboratory exercises, in total of 90 hours (8 ECTS). Lectures and seminars are held in the lecture halls and practical laboratory work at the Institute of Microbiology and Parasitology at the Faculty of Medicine in Rijeka.
The aim of the course is to provide students with the basic biological characteristics of microorganisms (bacteria, viruses, fungi and parasites) that cause human infections, their virulence factors, environmental resistance, their route of transmission, and the basis for human infection protection. Students will learn about different types of vaccines available for certain microbial infections. One of the goals is to teach basic groups of antimicrobial drugs, their spectrum of action, mechanism of action on the bacterial cell, and mechanisms of bacterial resistance to antimicrobial drugs. The aim is to introduce students with the possibilities of treating fungal, parasitic and viral infections. The students will also gain insight into the basic procedures of microbiological diagnostics, with particular emphasis on microbiological analysis of the most common clinical samples.
Course content:
General Medical Bacteriology: Micromorphology of bacteria, microscopy, microbiological stainings. Bacteria cell structure. Metabolism and genetics, growth and reproduction, nutrition and physical conditions of bacterial growth. Cell metabolism, energy production, and gene expression in the bacterial cell. Classification and nomenclature of bacteria. Bacterial antigens and vaccines. Immune response to
infections. Resistance of bacteria to physical and chemical factors. Sterilization procedures and sterilization control. Disinfectants and disinfections. Antimicrobial drugs: Mechanism and spectrum of antibiotic activity, bacterial resistance to antimicrobial agents. Pathogenesis of bacterial infections: bacterial pathogenicity and virulence. Laboratory Diagnosis of Bacterial Infections.
Special Medical Bacteriology: Normal human microbiota. Medical significant Gram-positive and gram negative bacteria. Atypical bacteria. Microbiological diagnosis of bacterial infections.
General Medical Mycology: Morphology, structure, reproduction, and Metabolism of clinically relevant fungi. Pathogenesis of fungal diseases. Factors of fungal virulence. Fungal diseases and laboratory diagnostics. Antifungal drugs.
Special Medical Mycology: Yeasts and molds of medical significance. Opportunistic and dimorphic fungi.
General Medical Parasitology: Parasitism as an ecological and medical concept. Laboratory diagnostics of parasitosis.
Special Medical Parasitology: Medically relevant parasites.
General Virology: General characteristics, classification, virus replication. Viral vaccines and antiviral drugs. Pathogenesis and laboratory diagnostics of viral diseases.
Special Virology: Medical Significant RNA and DNA Viruses. Prions.
Teaching:
Teaching is performed in the form of lectures, seminars and laboratory exercises, during 15 weeks. During the exercises, the teacher demonstrates and supervises the active participation of the students in performing the laboratory tests. During the course there will be compulsory midterm written exams, and a final laboratory exercise. At the end of the course a written part, and an oral part of the final exam will be held. By completing all teaching activities, and passing the final examination, the student acquires 8 ECTS credits.

Popis obvezne ispitne literature:

1. Jawetz, Melnick i Adelberg "Medical Microbiology”, 27th ed. New York: McGraw-Hill; 2016. (http://med-mu.com/wp-content/uploads/2018/06/Jawetz-Melnick-Adelbergs-Medical-Microbiology-27-edition.pdf)
2. Laboratory Excercises in Medical Microbiology – Practical Handbook for Medical Students, Institute of Microbiology and Parasitology.

Popis dopunske literature:

1. Josephine A. Morello JA, Granato PA, Eckel Mizer H. Laboratory Manual and Workbook in Microbiology, 7th ed. http://site.iugaza.edu.ps/mwhindi/files/Laboratory_Manual_And_Workbook_In_Microbiology.pdf
2. Todar's Online Textbook of Bacteriology http://textbookofbacteriology.net/
3. Microbiology and Immunology On-Line (https://www.microbiologybook.org/)

Nastavni plan:

Predavanja popis (s naslovima i pojašnjenjem):

L1 Overview of curriculum, literature and student obligations. Classification of bacteria.

-get acquainted with the microbiology course

- recall the rules in the taxonomy and clasification of living organisms, including microorganisms

- give examples of bacterial classification.

L2 Classification of antibiotics. Mechanism of action of antimicrobial drugs. Antimicrobial activity in vitro.

- explain the terms antibiotic, selective toxicity, bactericidal and bacteriostatic action, broad and narrowspectral antibiotic

- state the basic mechanisms of action of antimicrobial drugs on the bacterial cell

- explain the antibiotic susceptibility testing and explain the sensitivity categories (S, I, R)

L3 Basics of microbial genetics. Resistance to antimicrobial drugs. Multidrug resistant bacteria.

- state the basic mechanisms of bacterial resistance

- state all three ways of horizontal gene transfer between bacteria

- describe each of the above mentioned ways - give examples of multi

-resistant bacteria of medical significance

L4 Normal human microbiota. Bacterial biofilm. Phenotypic resistance.

- indicate the differences between resident and transient (skin) microbiota

- connect the microbiota with health maintaince and causing the disease

- define the bacterial biofilm and describe the way it originates

-indicate at least three reasons why bacteria associate in biofilm

- link biofilm with infections and clinical failure of antimicrobial therapy

- link biofilm with antibiotic resistance; explain the term phenotypic resistance

L5 Mycobacteria. Aerobic, non-spore-forming, gram-positive bacilli. (Corynebacterium, Listeria, Erysipelothrix)

- describe mycobacteria and discuss their staining and cultivation characteristics

- indicate all obligatory pathogenic and most usal opportunistic mycobacteria

- summarize the most important laboratory tests for tuberculosis diagnosis

- indicate first line antimicrobial drugs for tuberculosis treatment

- describe the properties of coryneform bacteria and characteristics of pathogenic species

- identify virulence factors for Corynebacterium diphteriae and associate them with the infection they cause

- discuss the possibility of diphtheria prevention

L6 Atypical bacteria – Mycoplasma, Chlamydia and Rickettsia.

- describe the characteristics of Mycoplasma and Ureaplasma

- describe their virulence factors and associate them with the pathogenesis of the infections they cause

- discuss the selection of antimicrobial drugs for the treatment of infections caused by mycoplasmas

- state the most significant species from the genera Chlamydia and Chlamydophila

- describe the replication cycle of Chlamydia and discuss the differences compared to "typical" bacteria

- categorize the most important intracellular, atypical bacteria according to their characteristics and types of vectors

- link them to the infections they cause and their modes of transmission

L7 Vibrio, Campylobacter, and Helicobacter. Yersinia

- describe micromorphology and ways of clustering of curved bacteria (vibrios, campylobacters)

- describe micromorphology and factors of helicobacter virulence and associate them with the infection they cause

- discuss the specificity of H. pylori laboratory diagnosis

- describe the properties of Yersinia and identify the most important species

- explain the way of plague transmission in connection with symptoms of infection and spread of pathogens (epidemics, pandemics)

- explain the pathogenesis of intestinal infections caused by Y. enterocolitica

L8 Nonfermenting Gram-negative bacilli: Pseudomonas, Acinetobacter, Stenotrophomonas, Burkholderia. Legionella and Bartonella.

- list the virulence factors of *Pseudomonas* and link them to the infections they cause

- discuss the significance of *Acinetobacter* in nosocomial (healthcare-associated) infections

- discuss the antimicrobial treatment options for infections caused by *Pseudomonas* and *Acinetobacter*

- describe the mode of transmission of *Legionella* and link it to infections in humans

L9 General properties of viruses. Pathogenesis and control of viral diseases.

-describe the structure of viruses and classify them according to the type of nucleic acid and other basic characteristics
· link viruses to the infections they cause

· explain the basic mechanisms of viral replication and link them to the pathogenesis of viral infections

· link the most significant viruses to the diseases they cause

· classify viral vaccines and provide examples of specific types

· list viral diseases for which specific antiviral treatment is available

· describe the mechanism of action of the most significant antiviral drugs and link it to specific phases of the viral replication cycle

L10 Hepatitis viruses. Paramyxoviridae. Togaviridae.

- classify hepatitis viruses by families and describe their most important characteristics and modes of transmission

- link hepatitis viruses to the diseases they cause, their potential complications, and options for prevention and specific treatment

-list HBV antigens and explain their significance in the laboratory diagnostics of hepatitis B

- classify the most significant genera and species within the Paramyxoviridae family and link them to the diseases they cause

- explain the pathogenesis of measles and mumps

- describe the characteristics of the Togaviridae family and link the rubella virus to pathogenesis, laboratory diagnostics, and infection prevention

L11 Emerging viruses. Viral zoonoses in our climate. Diagnostic methods in microbiology.

- explain the reasons for the emergence of new infectious disease agents

- give examples of threatening viral infections and list the characteristics of the causative agents

- explain the basic principles of microbiological diagnostic methods

- describe the steps and purpose of taking, transporting, and processing clinical samples for microbiological diagnostics

- list the advantages and limitations of diagnostic methods in microbiology

L12 Mycoses and antifungal drugs.

· list fungi of medical importance and link them to the infections they cause

· provide examples of the most common causative agents of mycoses

· list antifungals and group them according to their mechanism of action on the fungal cell

· describe the mechanisms of antifungal resistance

L13 Medical parasitology – intestinal protozoan infections, sexsually transmitted protozoan infections. Intestinal helminth infections.

- list protozoa that cause infections of the digestive and urogenital systems, describe their life cycle, and link it to the pathogenesis of the infection

· explain the principles of microbiological diagnostics for infections caused by intestinal and urogenital protozoa

· classify helminths of medical importance according to their structure and basic biological characteristics

· list tapeworms of medical importance and describe the life cycle of *Taenia* and *Echinococcus*

· classify flukes (trematodes) of medical importance and link them to the diseases they cause

L14 Medical parasitology - Blood and tissue protozoan infections (Plasmodium, Toxoplasma, Trypanosoma, Leishmania).

- describe the biological characteristics, mode of transmission, and life cycle of Plasmodium, and classify the most important species of the genus Plasmodium that cause malaria in humans

- link specific species of the genus Plasmodium to clinical forms of malaria

- list the most significant species of the genera Trypanosoma and Leishmania and link them to the diseases they cause

- describe the pathogenesis of toxoplasmosis, the modes of transmission of the pathogen, and the clinical significance of the infection

L15 Growth, survival, and control of microorganisms. Sterilisation and disinfection.

- list and describe the phases of bacterial growth and explain the bacterial growth curve

- define the terms biocide, bacteriostatic, bactericidal, sterilization, sepsis, asepsis, and antiseptic

- describe the mechanism of action of physical and chemical agents on the bacterial cell

- list sterilization procedures and provide examples of the use of specific procedures in medical practice

- list and describe the methods for monitoring sterilization procedures

- classify disinfectants according to their efficacy and usage

Vježbe popis (s naslovima i pojašnjenjem):

Lab1. Hand Hygiene. Laboratory equipment and basics of aseptic work in the laboratory. Microscopic Techniques. Preparation of Microscope Slides. Wet mount slide. Simple Staining

- list (and give an examples) all five moments (indication, occasion) for the hand hygiene

- apply hand hygiene (washing and rubbing) through 6 steps - perform aseptic procedures

- perform basic aseptic techniques in a microbiological laboratory

- prepare native and stained microscopic slides and perform simple bacteriological staining

- use a light microscope to visualize bacteria

Lab2. Direct diagnostics methods in Microbiology. Differential and Special (Complex) Staining. Bacterial Culture

- list the factors necessary for bacterial growth on artificial nutrient media

- perform Gram staining

- specify direct microbiological procedures for the diagnosis of infectious diseases

- describe ways to identify bacteria

Lab3. Antimicrobial Activity in vitro. Antimicrobial Susceptibility. EUCAST standards

- independently perform a disc diffusion method for determining susceptibility of bacteria to antimicrobials

- interpret the results of prepared disc diffusion test in accordance with current EUCAST standards

- link the findings of susceptibility test to choice of antimicrobial therapy in clinical practice

- read prepared dilution susceptibility and E-tests and interprete the results

- define the terms MIC and MBC

Lab4. Diagnosis of Infection from Upper Respiratory System. Sampling and Processing Throat and Nose Swabs. Laboratory Procedures for the Identification of Streptococci and Staphylococci

- name the most common causes of upper respiratory tract infections

- associate the bacterium with the infection they cause

- sample the throat and nose swabs

Perform antigen detection for Group A beta-hemolytic Streptococcus (BHS-A)

- determine the type of most common respiratory pathogens according to the microscopic or other characteristics

- perform tests to distinguish between staphylococci and streptococci

Lab5. Diagnosis of Infection from Lower Respiratory System. Management of Sputum, Endotracheal aspirate (ETA), Bronchoalveolar lavage (BAL). Laboratory Procedures for the Identification of Mycobacteria. Cultivation of Anaerobes. Sporogenic Bacteria

- assess specimen quality using the sputum Gram stain

- perform microbiological laboratory procedures for samples from the lower respiratory system

- recall the characteristics of M. tuberculosis and link them to diagnostic methods

- review and describe microscopic smears stained with Ziehl-Neelsen technique

- explain the principle and significance of IGRA tests in the diagnosis of mycobacterial infections

- describe the principles of cultivating anaerobic bacteria and identify the most important spore-forming bacteria of medical significance

Lab6. Diagnosis of Infection from Gastrointestinal tract. Laboratory Procedures for the Identification of Intestinal Pathogens (Enterobacteriaceae, Campylobacter, Helicobacter)

- name obligate pathogenic gut bacteria; list selective and differential media for isolation of a particular type of bacteria

- perform stool culture using different selective media

- identify specific intestinal pathogens based on colony morphology and biochemical tests

- perform agglutination tests for serotyping of Salmonella

- demonstration of the POCT test for diagnosis of Helicobacter

Lab7. Bacteriological urine processing – urine culture

- perform urine culture and determine the number of bacteria per millilitre of the urine sample

- interpret antimicrobial susceptibility testing results.

- identify the core resistance mechanisms of Enterobacteriaceae based on phenotypic tests

- discuss the clinical significance of antimicrobial resistance

- differentiate between fermentative and non-fermentative bacteria and list the diagnostic tests used for their differentiation

Lab8. Management of Samples from Normally Sterile Body Sites (Blood culture, Cerebrospinal Fluid). Laboratory Procedures for the Identification of Haemophilus and Gram-negative Non-fermentative Bacteria

- name the most common pathogens for blood and central nervous system infections

- associate the bacterium with the infection they cause

- perform basic microbiological processing of blood culture and cerebrospinal fluid (CSF) samples

- make microscopic smears from positive blood cultures and CFS and recognize the micromorphology of bacteria

- describe the basic procedures for identifying Haemophilus and Gram-negative non-fermentative bacteria

- interpret the results of laboratory tests for identifying the most important bacterial pathogens in primarily sterile specimens

Lab 9. Diagnostics of Sexually Transmitted Infections. Molecular methods. Serological methods. Microbiological diagnostics of syphilis and borreliosis

- differentiate between direct and indirect methods of microbiological diagnosis

- recognize and properly interpret basic serological tests

- correlate serological test results with the stage of infection

- differentiate the most important genera of spiral bacteria based on micromorphology and mode of transmission

- interpret the role of serological tests in the diagnosis of syphilis and Lyme disease

- describe the basic principles of applying molecular methods in the diagnosis of sexually transmitted infections

Lab10. Laboratory Diagnosis of Viral Infections

- discuss the differences between bacteria and viruses and link them to the laboratory diagnosis of viral infections
- list direct and indirect microbiological procedures in the diagnosis of viral infections and discuss their choice
- describe and discuss the typical antibody profile following primary EBV infection against specific antigens

- interpret serological and molecular diagnostic findings for selected viral infections (CMV, HBV, HCV)

- describe and interpret the results of prepared Western blot assays in the diagnosis of herpesvirus and parvovirus infections

Lab11. Microbiological Diagnosis of Mycoses Caused by Yeasts and Molds

- remember the characteristics and differences between yeasts and molds and relate them to the methods of microbiological diagnostics

- macroscopically and microscopically examine the prepared fungal cultures

- recognize the morphology of individual fungi based on macroscopic and microscopic characteristics

Lab12. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of gastrointestinal, urogenital, blood, and tissue protozoa

-describe basic laboratory procedures in parasitological diagnostics.

- prepare microscopic slides from stool samples; compare own results with demonstration microscopic slides; identify cysts of specific protozoa and eggs of multicellular parasites

- recognize morphological forms of *Plasmodium* in prepared blood smears and thick blood films; calculate the level of parasitemia

- examine formalin-fixed specimens and describe adult forms of tapeworms, flukes, and roundworms

Lab13. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of Flatworms and Roundworms. Arthropod vectors of infectious diseases

- identify the most important representatives of flatworms and roundworms based on their morphological characteristics

- link specific helminths with the diseases they cause and their modes of infection transmission

- correctly interpret basic parasitological findings

- list the most important arthropods involved in the transmission of infectious diseases

- connect specific vectors with the pathogens and diseases they transmit

Lab14. Diagnostic Medical Microbiology and Clinical Correlations.

- students will be able to interpret laboratory findings within the context of clinical symptoms and patient medical history. This outcome emphasises the importance of integrating laboratory results with the clinical presentation, thereby improving diagnostic accuracy and the quality of patient care.

- students will be able to apply knowledge of diagnostic techniques in simulated clinical scenarios. This outcome enables students to develop the practical skills necessary to solve real-world medical problems, effectively bridging the gap between theory and practice.

Lab15. Diagnostic Medical Microbiology and Clinical Correlations

- students will be able to interpret laboratory findings within the context of clinical symptoms and patient medical history. This outcome emphasises the importance of integrating laboratory results with the clinical presentation, thereby improving diagnostic accuracy and the quality of patient care.

- students will be able to apply knowledge of diagnostic techniques in simulated clinical scenarios. This outcome enables students to develop the practical skills necessary to solve real-world medical problems, effectively bridging the gap between theory and practice

Seminari popis (s naslovima i pojašnjenjem):

S1 Bacterial virulence factors. Pathogenesis of bacterial infections.

- describe the structure of the bacterial cell and compare the structure of gram-negative and grampositive bacteria

- explain the terms pathogenicity and virulence

- associate bacterial cell structure with virulence factors

- list the virulence factors of the bacteria and relate them to the pathogenesis of bacterial infections

S2 Clinical use of antibiotics. Antimicrobial drugs for systemic administration I part.

- group and give examples of individual antimicrobials depending on their activity and mechanism of action on the bacterial cell

- discuss the most important mechanisms of bacterial resistance

S3 Clinical use of antibiotics. Antimicrobial drugs for systemic administration II part.

- group and give examples of individual antimicrobials depending on their activity and mechanism of 5 action on the bacterial cell

- discuss the most important mechanisms of bacterial resistance

S4 The staphylococci. The streptococci, and enterococci.

- describe micromorphology and arrangement of gram positive cocci

- list the virulence factors of staphylococci, streptococci and enterococci and relate them to the infections they cause

- discuss microbiological procedures for the identification of staphylococci, streptococci, enterococci

S5 Gram-positive spore-forming bacterial genera. Anaerobic bacteria.

- to describe the micromorphology of clostridia and procedures for demonstrating bacterial spores

- to describe the pathogenesis of clostridial infections and discuss microbiological diagnostic procedures for anaerobic bacteria

- to group bacteria based on the effect of oxygen

- to list the enzymes responsible for bacterial anaerobiosis

- to list the clinical features indicating an anaerobic infection

S6 Gram-negative enteric bacilli.

- to describe the micromorphology and characteristics of enterobacteria

- to name the most significant species causing intestinal infections

- to list the characteristics of salmonellae and link them to the infections they cause

- to correlate the transmission route of salmonellae with infection onset and control measures

- to list significant multidrug-resistant enterobacteria as important causative agents of healthcare-associated infections

S7 Haemophilus and other fastidious Gram-negative coccobacilli (Bordetella, Brucella, Francisella). Moraxella.

- to describe the micromorphology and specific growth requirements of fastidious gram-negative coccobacilli

- to list the virulence factors of haemophilus and correlate them with the infections they cause

- to discuss microbiological procedures for the identification of fastidious gram-negative coccobacilli

- to describe the micromorphology and specific characteristics of moraxellae and discuss their clinical significance

S8 The Neisseriae. Spirochetes and other spiral microorganisms.

- to describe the micromorphology and grouping patterns of Gram-negative cocci

- to list the virulence factors of Neisseriae and correlate them with the infections they cause

- to classify spiral bacteria into genera and species

- to list their most significant characteristics and virulence factors and correlate them with the infections they cause

- to discuss the specific aspects of laboratory diagnosis for infections caused by spirochetes

- to explain the principle of serological diagnosis; to define antibody titer

S9 Herpesviruses, Adenoviruses. Parvoviruses. Papillomaviruses. Rabies.

- describe the characteristics, structure, and mode of amplification of DNA viruses

- discuss pathogenetic mechanisms in the emergence of infections caused by DNA viruses

- classify herpesviruses and describe pathogenetic characteristics (latency; persistence; recurrence)

- describe the characteristics, structure and method of multiplication of rabies virus and relate them to the infection they cause.

- list and isolate the most significant way of transmitting rabies virus

S10 Picornaviruses. Orthomyxoviruses. Coronaviruses. Reoviruses. HIV.

- to classify individual genera within the Picornaviridae family, list the most significant species, and correlate them with the infections they cause

- to describe the pathogenesis of poliomyelitis

- to describe the characteristics, structure, and replication method of orthomyxoviruses and reoviruses and correlate them with the infection they cause

- to explain the transmission routes and laboratory diagnosis options for infections caused by orthomyxoviruses and reoviruses

- to describe the structure and replication method of human immunodeficiency virus (HIV) and correlate them with the pathogenesis of HIV infection

- to explain the transmission routes, laboratory diagnosis, and basic principles of preventing HIV infection

S11 Medical mycology.

- specify the characteristics of yeasts and molds and identify those fungi that are the most common pathogens in clinical practice

- describe candida characteristics; list the most common species and associate them with sensitivity / resistance to available antifungals

- describe the characteristics and natural history of cryptococcosis

- describe the characteristics and virulence factors of aspergillus; their mode of transmission, and the clinical findings

S12 Medical parasitology – intestinal nematodes.

- list and describe morpohology of round worms of medical importance

- describe the life cycle of trichinella and pinworm and relate them to diagnostic procedures

S13 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.

- link clinical cases to the possible causative agent and correlate with microbiology diagnosis

S14 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.

- link clinical cases to the possible causative agent and correlate with microbiology diagnosis

S15 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.

link clinical cases to the possible causative agent and correlate with microbiology diagnosis

Obveze studenata:

All forms of teaching, lectures, seminars and laboratory exercises are compulsory. Each student is expected to attend all teaching units, actively participate in discussions and laboratory exercises. A student may be absent from a total of 30% of teaching solely for health reasons, which justifies with a medical certificate. If a student justifiably or unjustifiably misses more than 30% of teaching he/she
cannot continue to follow the course and loses the opportunity to attend the final exam. In doing so, he earned 0 ECTS credits and was rated with mark F.
To work in a microbiology lab, students must wear a protective coat and have a handbook which they can buy at the Faculty of Medicine Rijeka. The handbook homepage lists the rules for safe work in the lab. Students are required to regularly perform hand hygiene (hand wash or hand rub) according to the instructions given in the introductory exercise, and are also indicated in the handbook and reported in the form of posters in the laboratory. When entering the laboratory for the first time, students are required to read all the rules and confirm with their signature that they will abide by them.
A record on attendance and activity in the classroom will be kept for each student. Knowledge will be continually evaluated and the students should prepare for the classes according to the syllabus. There will be 2 midterm written tests, and a final practical exercise. The final exam consists of a written and oral parts.
By completing all teaching activities, taking the obligatory midterms, practical excersice and passing the both parts of the final exam, the student earns 8 ECTS credits.

Ispit (način polaganja ispita, opis pisanog/usmenog/praktičnog dijela ispita, način bodovanja, kriterij ocjenjivanja):

ECTS grading system:
Student assessment is carried out in accordance with the current regulations of the University of Rijeka, adopted by the Faculty Council of the Faculty of Medicine in Rijeka.

Students' performance will be evaluated during the course and at the final exam. Out of a total of 100 credits, a **student can earn 50 credits during the course, and 50 credits at the final exam** . Students are assessed using ECTS (A-D) and the numerical system (1-5).

The maximum of 50 credit points can be earned during the course. The students must earn at least 50% (25 credit points) in order to take the final exam. Students who earn 0-49.9% (0-24.9 credit points) during the course, earn an F (fail) grade, no ECTS credits, and must re-enroll in the course.

During the course, the **student can earn a maximum of 50 credit point** by actively participating in classes, completing all assignments, attending midterm exams, and final laboratory excercise as follows:

I. During the course, the following are evaluated:
a) **Midterm test I/ Colloquium I** covers knowledge acquired by the date of the midterm test (general and part of special bacteriology). The mid-term test consists of 50 multiple-choice questions with five answers offered. Each correct answer carries half a point. It is possible to get up to 25 points on the test.

b) **Midterm / Colloquium II** includes virology, mycology and parasitology. The mid-term test consists of 50 multiple-choice questions with five answers offered. Each correct answer carries half a point. It is possible to get up to 25 points on the test.

On two midterms, a student can achieve a maximum total of 50 grading points. To qualify for the final exam, a total of at least 25 grading points must be achieved.

Final Exam (50 credit points in total)
To be eligible for the final exam, students must:

- **Students who have earned a total of at least 25 grading points during the semester (50% of the points allocated for continuous assessment) or have met this requirement after the makeup midterm exam.**
- **Students who earn fewer than 25 grading points during the semester have the right to take one makeup midterm exam, specifically for the midterm in which they scored fewer points. The makeup midterm exam will be held after the end of classes.**

Students who do not qualify for the final exam:

- **Students who fail to earn a total of at least 25 grading points even after the makeup midterm exam, or who have an absence rate of 30% or higher, will receive a grade of F (fail), will not earn ECTS credits, and are required to retake the course.**

  The final exam consists of a written and an oral part. The written test contains 80 multiple-choice questions The student in the final exam must pass at least
  55% (44 correct answers) of the written test and be positively evaluated in the oral part of the exam.
- The **scoring method** for
  the final exam is shown in **Table 2.**

Written test		Oral exam	
Correct answers (%)	**Points**	**Grade**	Points
< 44 (< 55 %)	0 impassable	sufficient (2)	15 - 18

44 – 45 (55 – 57,4 %)	10	good (3)	19 - 22
46 – 47 (57,5 – 59,9 %)	11	very good (4)	23 - 26
48 – 51 (60 – 64,9 %)	12	excellent (5)	27 - 30
52 – 55 (65 – 69,9 %)	13		
56 – 59 (70 – 74,9 %)	14		
60 – 63 (75 – 79,9 %)	15		
64 – 67 (80 – 84,9 %)	16		
68 – 71 (85 – 89,9 %)	17		
72 – 75 (90 – 94,9 %)	18		
76 – 78 (95 – 98,7 %)	19		
79 – 80 (98,8 – 100 %)	20		

Assessment in the ECTS system is done by absolute distribution, ie on the basis of final achievement (credit points earned during the course are added to the points from the final exam):
A = 90 - 100%
B = 75 - 89,9%
C = 60 - 74,9%
D = 50 - 59,9%
F = 0 - 49,9%

The grades in the ECTS system are translated into the numerical system as follows:
A = escellent (5)
B = very good (4)
C = good (3)
D = sufficient (2)
F = insufficient (1)

Ostale napomene (vezane uz kolegij) važne za studente:

The course contents and all course related information as well as the midterm, and final exams terms are available on the web pages of the Faculty of Medicine, University of Rijeka and the Department of Microbiology and Parasitology.

SATNICA IZVOĐENJA NASTAVE 2026/2027

Medical Microbiology and Parasitology

Predavanja (mjesto i vrijeme / grupa)	**Vježbe** (mjesto i vrijeme / grupa)	**Seminari** (mjesto i vrijeme / grupa)
06.10.2026		

L1 Overview of curriculum, literature and student obligations. Classification of bacteria.:
• P08 (10:00 - 12:00) [1468]
  ○ MMAP
	Lab1. Hand Hygiene. Laboratory equipment and basics of aseptic work in the laboratory. Microscopic Techniques. Preparation of Microscope Slides. Wet mount slide. Simple Staining:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1771] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3281]
	  ○ MMPG1B
		S1 Bacterial virulence factors. Pathogenesis of bacterial infections.:
		• P08 (12:00 - 14:00) [1468]
		  ○ MMPG1

doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Rebić Danica [1287] · Tomas Gabriel [3281] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
08.10.2026		

	Lab1. Hand Hygiene. Laboratory equipment and basics of aseptic work in the laboratory. Microscopic Techniques. Preparation of Microscope Slides. Wet mount slide. Simple Staining:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [245] [3606]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3607]
	  ○ MMPG2B
		S1 Bacterial virulence factors. Pathogenesis of bacterial infections.:
		• P07 (12:00 - 14:00) [1468]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Zvonar Sandra [3607] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
12.10.2026		
L2 Classification of antibiotics. Mechanism of action of antimicrobial drugs. Antimicrobial activity in vitro.: • P08 (09:00 - 11:00) [245] ○ MMAP		
doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245]		
13.10.2026		

L3 Basics of microbial genetics. Resistance to antimicrobial drugs. Multidrug resistant bacteria.:
• P08 (10:00 - 12:00) [245]
  ○ MMAP
	Lab2. Direct diagnostics methods in Microbiology. Differential and Special (Complex) Staining. Bacterial Culture:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3281]
	  ○ MMPG1B
		S2 Clinical use of antibiotics. Antimicrobial drugs for systemic administration I part.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG1

doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
15.10.2026		

	Lab2. Direct diagnostics methods in Microbiology. Differential and Special (Complex) Staining. Bacterial Culture:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3607]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3606]
	  ○ MMPG2B
		S2 Clinical use of antibiotics. Antimicrobial drugs for systemic administration I part.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
20.10.2026		

L4 Normal human microbiota. Bacterial biofilm. Phenotypic resistance.:
• P08 (10:00 - 12:00) [250]
  ○ MMAP
	Lab3. Antimicrobial Activity in vitro. Antimicrobial Susceptibility. EUCAST standards:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3281]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [1287]
	  ○ MMPG1B
		S3 Clinical use of antibiotics. Antimicrobial drugs for systemic administration II part.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG1

prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
22.10.2026		

	Lab3. Antimicrobial Activity in vitro. Antimicrobial Susceptibility. EUCAST standards:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3606]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3607]
	  ○ MMPG2B
		S3 Clinical use of antibiotics. Antimicrobial drugs for systemic administration II part.:
		• ONLINE (12:00 - 14:00) [245]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
27.10.2026		

L5 Mycobacteria. Aerobic, non-spore-forming, gram-positive bacilli. (Corynebacterium, Listeria, Erysipelothrix):
• P08 (10:00 - 12:00) [1468]
  ○ MMAP
	Lab4. Diagnosis of Infection from Upper Respiratory System. Sampling and Processing Throat and Nose Swabs. Laboratory Procedures for the Identification of Streptococci and Staphylococci:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3606]
	  ○ MMPG1B
		S4 The staphylococci. The streptococci, and enterococci.:
		• P08 (12:00 - 14:00) [1272]
		  ○ MMPG1

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29.10.2026		

	Lab4. Diagnosis of Infection from Upper Respiratory System. Sampling and Processing Throat and Nose Swabs. Laboratory Procedures for the Identification of Streptococci and Staphylococci:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3607]
	  ◦ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3606]
	  ◦ MMPG2B
		S4 The staphylococci. The streptococci, and enterococci.:
		• P08 (12:00 - 14:00) [1272]
		  ◦ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
03.11.2026		

L6 Atypical bacteria – Mycoplasma, Chlamydia and Rickettsia.:
• P08 (10:00 - 12:00) [1468]
  ◦ MMAP
	Lab5. Diagnosis of Infection from Lower Respiratory System. Management of Sputum, Endotracheal aspirate (ETA), Bronchoalveolar lavage (BAL). Laboratory Procedures for the Identification of Mycobacteria. Cultivation of Anaerobes. Sporogenic Bacteria:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3281]
	  ◦ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [1287]
	  ◦ MMPG1B
		S5 Gram-positive spore-forming bacterial genera. Anaerobic bacteria.:
		• P07 (12:00 - 14:00) [250]
		  ◦ MMPG1

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05.11.2026		

	Lab5. Diagnosis of Infection from Lower Respiratory System. Management of Sputum, Endotracheal aspirate (ETA), Bronchoalveolar lavage (BAL). Laboratory Procedures for the Identification of Mycobacteria. Cultivation of Anaerobes. Sporogenic Bacteria:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3607]
	  ◦ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3281]
	  ◦ MMPG2B
		S5 Gram-positive spore-forming bacterial genera. Anaerobic bacteria.:
		• P07 (12:00 - 14:00) [250]
		  ◦ MMPG2

prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Tomas Gabriel [3281] · Zvonar Sandra [3607]		
10.11.2026		

L7 Vibrio, Campylobacter, and Helicobacter. Yersinia:
• ONLINE (10:00 - 12:00) [1468]
  ◦ MMAP
	Lab6. Diagnosis of Infection from Gastrointestinal tract. Laboratory Procedures for the Identification of Intestinal Pathogens (Enterobacteriaceae, Campylobacter, Helicobacter):
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1771] [1287]
	  ◦ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3281]
	  ◦ MMPG1B
		S6 Gram-negative enteric bacilli.:
		• P08 (12:00 - 14:00) [250]
		  ◦ MMPG1

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12.11.2026		

	Lab6. Diagnosis of Infection from Gastrointestinal tract. Laboratory Procedures for the Identification of Intestinal Pathogens (Enterobacteriaceae, Campylobacter, Helicobacter):
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [245] [3281]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3607]
	  ○ MMPG2B
		S6 Gram-negative enteric bacilli.:
		• P09 - NASTAVA NA ENGLESKOM JEZIKU (12:00 - 14:00) [250]
		  ○ MMPG2

prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Tomas Gabriel [3281] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
17.11.2026		

L8 Nonfermenting Gram-negative bacilli: Pseudomonas, Acinetobacter, Stenotrophomonas, Burkholderia. Legionella and Bartonella.:
• P08 (10:00 - 12:00) [250]
  ○ MMAP
	Lab7. Bacteriological urine processing – urine culture:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1771] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3606]
	  ○ MMPG1B
		S7 Haemophilus and other fastidious Gram-negative coccobacilli (Bordetella, Brucella, Francisella). Moraxella.:
		• P09 - NASTAVA NA ENGLESKOM JEZIKU (12:00 - 14:00) [250]
		  ○ MMPG1

prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Rebić Danica [1287] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
19.11.2026		

	Lab7. Bacteriological urine processing – urine culture:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [245] [3607]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3606]
	  ○ MMPG2B
		S7 Haemophilus and other fastidious Gram-negative coccobacilli (Bordetella, Brucella, Francisella). Moraxella.:
		• P07 (12:00 - 14:00) [250]
		  ○ MMPG2

prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
24.11.2026		

L9 General properties of viruses. Pathogenesis and control of viral diseases.:
• P07 (10:00 - 12:00) [245]
  ○ MMAP
	Lab8. Management of Samples from Normally Sterile Body Sites (Blood culture, Cerebrospinal Fluid). Laboratory Procedures for the Identification of Haemophilus and Gram-negative Non-fermentative Bacteria:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3281]
	  ○ MMPG1B
		S8 The Neisseriae. Spirochetes and other spiral microorganisms.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG1

doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281]		
26.11.2026		

	Lab8. Management of Samples from Normally Sterile Body Sites (Blood culture, Cerebrospinal Fluid). Laboratory Procedures for the Identification of Haemophilus and Gram-negative Non-fermentative Bacteria: • Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3606] ◦ MMPG2A • Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3607] ◦ MMPG2B	S8 The Neisseriae. Spirochetes and other spiral microorganisms.: • P09 - NASTAVA NA ENGLESKOM JEZIKU (12:00 - 14:00) [1468] ◦ MMPG2
Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468]		
01.12.2026		
L10 Hepatitis viruses. Paramyxoviridae. Togaviridae.: • P08 (10:00 - 12:00) [1468] ◦ MMAP	Lab 9. Diagnostics of Sexually Transmitted Infections. Molecular methods. Serological methods. Microbiological diagnostics of syphilis and borreliosis: • Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3281] ◦ MMPG1A • Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [1287] ◦ MMPG1B	S9 Herpesviruses, Adenoviruses. Parvoviruses. Papillomaviruses. Rabies.: • P08 (12:00 - 14:00) [1468] ◦ MMPG1
doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
03.12.2026		
	Lab 9. Diagnostics of Sexually Transmitted Infections. Molecular methods. Serological methods. Microbiological diagnostics of syphilis and borreliosis: • Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3607] ◦ MMPG2A • Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3606] ◦ MMPG2B	S9 Herpesviruses, Adenoviruses. Parvoviruses. Papillomaviruses. Rabies.: • P07 (12:00 - 14:00) [1468] ◦ MMPG2
Hatić Mihaela [3606] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
08.12.2026		
L11 Emerging viruses. Viral zoonoses in our climate. Diagnostic methods in microbiology.: • P08 (10:00 - 12:00) [1468] ◦ MMAP	Lab10. Laboratory Diagnosis of Viral Infections: • Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1483] [1287] ◦ MMPG1A • Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3281] ◦ MMPG1B	S10 Picornaviruses. Orthomyxoviruses. Coronaviruses. Reoviruses. HIV.: • P08 (12:00 - 14:00) [245] ◦ MMPG1
dr. sc. Antonić Maša, mag. pharm. inv. [1483] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Rebić Danica [1287] · Tomas Gabriel [3281] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
10.12.2026		

	Lab10. Laboratory Diagnosis of Viral Infections:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3606]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1483] [3607]
	  ○ MMPG2B
		S10 Picornaviruses. Orthomyxoviruses. Coronaviruses. Reoviruses. HIV.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG2

dr. sc. Antonić Maša, mag. pharm. inv. [1483] · Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607]		
15.12.2026		

L12 Mycoses and antifungal drugs.:
• P08 (10:00 - 12:00) [250]
  ○ MMAP
	Lab11. Microbiological Diagnosis of Mycoses Caused by Yeasts and Molds:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1483] [3281]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1272] [1287]
	  ○ MMPG1B
		S11 Medical mycology.:
		• P07 (12:00 - 14:00) [250]
		  ○ MMPG1

dr. sc. Antonić Maša, mag. pharm. inv. [1483] · prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281]		
17.12.2026		

	Lab11. Microbiological Diagnosis of Mycoses Caused by Yeasts and Molds:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3607]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1483] [3606]
	  ○ MMPG2B
		S11 Medical mycology.:
		• P08 (12:00 - 14:00) [250]
		  ○ MMPG2

dr. sc. Antonić Maša, mag. pharm. inv. [1483] · prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · Hatić Mihaela [3606] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607]		
22.12.2026		

L13 Medical parasitology – intestinal protozoan infections, sexsually transmitted protozoan infections. Intestinal helminth infections.:
• ONLINE (10:00 - 12:00) [250]
  ○ MMAP
		S12 Medical parasitology – intestinal nematodes.:
		• ONLINE (12:00 - 14:00) [245]
		  ○ MMPG1

prof. dr. sc. Gobin Ivana, dipl. sanit. ing. [250] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245]		
07.01.2027		

	Lab12. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of gastrointestinal, urogenital, blood, and tissue protozoa:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [3281]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [1287]
	  ○ MMPG2B
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (16:00 - 18:00) [1272] [3606]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (16:00 - 18:00) [245] [3607]
	  ○ MMPG1B
		S12 Medical parasitology – intestinal nematodes.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281] · Zvonar Sandra [3607]		
12.01.2027		

L14 Medical parasitology - Blood and tissue protozoan infections (Plasmodium, Toxoplasma, Trypanosoma, Leishmania).:
• P09 - NASTAVA NA ENGLESKOM JEZIKU (10:00 - 12:00) [1468]
  ○ MMAP
	Lab13. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of Flatworms and Roundworms. Arthropod vectors of infectious diseases:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1771] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3281]
	  ○ MMPG1B
		S13 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG1

doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Rebić Danica [1287] · Tomas Gabriel [3281] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
14.01.2027		

	Lab13. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of Flatworms and Roundworms. Arthropod vectors of infectious diseases:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [245] [3606]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3607]
	  ○ MMPG2B
		S13 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.:
		• P08 (12:00 - 14:00) [245]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
19.01.2027		

L15 Growth, survival, and control of microorganisms. Sterilisation and disinfection.:
• P08 (10:00 - 12:00) [1468]
  ○ MMAP
	Lab14. Diagnostic Medical Microbiology and Clinical Correlations.:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1771] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [245] [3281]
	  ○ MMPG1B
		S14 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.:
		• P08 (12:00 - 14:00) [1272]
		  ○ MMPG1

doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281] · prof. dr. sc. Šantić Marina, dipl. sanit. ing. [1468] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		

21.01.2027		

	Lab14. Diagnostic Medical Microbiology and Clinical Correlations.:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [245] [3606]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3607]
	  ○ MMPG2B
		S14 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.:
		• P08 (12:00 - 14:00) [1272]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
26.01.2027		

	Lab15. Diagnostic Medical Microbiology and Clinical Correlations:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [1272] [1287]
	  ○ MMPG1A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3281]
	  ○ MMPG1B
		S15 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.:
		• P07 (12:00 - 14:00) [1272]
		  ○ MMPG1

doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Rebić Danica [1287] · Tomas Gabriel [3281] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		
28.01.2027		

	Lab15. Diagnostic Medical Microbiology and Clinical Correlations:
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika (14:00 - 16:00) [245] [3607]
	  ○ MMPG2A
	• Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala (14:00 - 16:00) [1771] [3606]
	  ○ MMPG2B
		S15 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.:
		• P08 (12:00 - 14:00) [1272]
		  ○ MMPG2

Hatić Mihaela [3606] · doc. dr. sc. Mihelčić Mirna, dr. vet. med. [245] · doc. dr. sc. Mohar Vitezić Bojana, mag. mikrobiol. [1272] · Zvonar Sandra [3607] · naslovna asistentica Škrobonja Ivana, dr. med. [1771]		

Popis predavanja, seminara i vježbi:

PREDAVANJA (TEMA)	Broj sati	Mjesto održavanja
L1 Overview of curriculum, literature and student obligations. Classification of bacteria.	2	P08
L2 Classification of antibiotics. Mechanism of action of antimicrobial drugs. Antimicrobial activity in vitro.	2	P08
L3 Basics of microbial genetics. Resistance to antimicrobial drugs. Multidrug resistant bacteria.	2	P08
L4 Normal human microbiota. Bacterial biofilm. Phenotypic resistance.	2	P08
L5 Mycobacteria. Aerobic, non-spore-forming, gram-positive bacilli. (Corynebacterium, Listeria, Erysipelothrix)	2	P08
L6 Atypical bacteria – Mycoplasma, Chlamydia and Rickettsia.	2	P08
L7 Vibrio, Campylobacter, and Helicobacter. Yersinia	2	ONLINE
L8 Nonfermenting Gram-negative bacilli: Pseudomonas, Acinetobacter, Stenotrophomonas, Burkholderia. Legionella and Bartonella.	2	P08

L9 General properties of viruses. Pathogenesis and control of viral diseases.	2	P07
L10 Hepatitis viruses. Paramyxoviridae. Togaviridae.	2	P08
L11 Emerging viruses. Viral zoonoses in our climate. Diagnostic methods in microbiology.	2	P08
L12 Mycoses and antifungal drugs.	2	P08
L13 Medical parasitology – intestinal protozoan infections, sexsually transmitted protozoan infections. Intestinal helminth infections.	2	ONLINE
L14 Medical parasitology - Blood and tissue protozoan infections (Plasmodium, Toxoplasma, Trypanosoma, Leishmania).	2	P09 - NASTAVA NA ENGLESKOM JEZIKU
L15 Growth, survival, and control of microorganisms. Sterilisation and disinfection.	2	P08

VJEŽBE (TEMA)	Broj sati	Mjesto održavanja
Lab1. Hand Hygiene. Laboratory equipment and basics of aseptic work in the laboratory. Microscopic Techniques. Preparation of Microscope Slides. Wet mount slide. Simple Staining	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab2. Direct diagnostics methods in Microbiology. Differential and Special (Complex) Staining. Bacterial Culture	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab3. Antimicrobial Activity in vitro. Antimicrobial Susceptibility. EUCAST standards	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab4. Diagnosis of Infection from Upper Respiratory System. Sampling and Processing Throat and Nose Swabs. Laboratory Procedures for the Identification of Streptococci and Staphylococci	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab5. Diagnosis of Infection from Lower Respiratory System. Management of Sputum, Endotracheal aspirate (ETA), Bronchoalveolar lavage (BAL). Laboratory Procedures for the Identification of Mycobacteria. Cultivation of Anaerobes. Sporogenic Bacteria	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab6. Diagnosis of Infection from Gastrointestinal tract. Laboratory Procedures for the Identification of Intestinal Pathogens (Enterobacteriaceae, Campylobacter, Helicobacter)	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab7. Bacteriological urine processing – urine culture	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab8. Management of Samples from Normally Sterile Body Sites (Blood culture, Cerebrospinal Fluid). Laboratory Procedures for the Identification of Haemophilus and Gram-negative Non-fermentative Bacteria	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab 9. Diagnostics of Sexually Transmitted Infections. Molecular methods. Serological methods. Microbiological diagnostics of syphilis and borreliosis	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab10. Laboratory Diagnosis of Viral Infections	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika

Lab11. Microbiological Diagnosis of Mycoses Caused by Yeasts and Molds	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab12. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of gastrointestinal, urogenital, blood, and tissue protozoa	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab13. Laboratory Procedures in Parasitology Diagnosis. Diagnostics of Flatworms and Roundworms. Arthropod vectors of infectious diseases	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab14. Diagnostic Medical Microbiology and Clinical Correlations.	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika
Lab15. Diagnostic Medical Microbiology and Clinical Correlations	2	Zavod za mikrobiologiju i parazitologiju - Vježbaonica mala Zavod za mikrobiologiju i parazitologiju - Vježbaonica velika

SEMINARI (TEMA)	Broj sati	Mjesto održavanja
S1 Bacterial virulence factors. Pathogenesis of bacterial infections.	2	P07 P08
S2 Clinical use of antibiotics. Antimicrobial drugs for systemic administration I part.	2	P08
S3 Clinical use of antibiotics. Antimicrobial drugs for systemic administration II part.	2	ONLINE P08
S4 The staphylococci. The streptococci, and enterococci.	2	P08
S5 Gram-positive spore-forming bacterial genera. Anaerobic bacteria.	2	P07
S6 Gram-negative enteric bacilli.	2	P08 P09 - NASTAVA NA ENGLESKOM JEZIKU
S7 Haemophilus and other fastidious Gram-negative coccobacilli (Bordetella, Brucella, Francisella). Moraxella.	2	P07 P09 - NASTAVA NA ENGLESKOM JEZIKU
S8 The Neisseriae. Spirochetes and other spiral microorganisms.	2	P08 P09 - NASTAVA NA ENGLESKOM JEZIKU
S9 Herpesviruses, Adenoviruses. Parvoviruses. Papillomaviruses. Rabies.	2	P07 P08
S10 Picornaviruses. Orthomyxoviruses. Coronaviruses. Reoviruses. HIV.	2	P08
S11 Medical mycology.	2	P07 P08
S12 Medical parasitology – intestinal nematodes.	2	ONLINE P08
S13 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.	2	P08
S14 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.	2	P08
S15 Principles of diagnostic medical microbiology. Cases and Clinical Correlations.	2	P07 P08

ISPITNI TERMINI (završni ispit):

1.	11.02.2027.
2.	24.02.2027.
3.	07.07.2027.
4.	02.09.2027.
5.	16.09.2027.