Study program: Integrated undergraduate and master academic studies

Course title: Microbiology and Immunology 1

Teacher/Teachers: prof. dr Nenad Milić, prof. dr Dejan Krnjaić, prof. dr Jakov Nišavić, prof. dr Marina Radojičić, doc. dr Andrea Radalj

Associate/ associates: as. Isidora Prošić

Course status: Obligatory scientific-professional

ECTS credits: 6

Prerequisites: enrolled in the third semester of integrated undergraduate and master academic studies

Course objectives

Acquiring knowledge about the shape, structure, physiological and antigenic characteristics of pathogenic and non-pathogenic microorganisms, their ecology, antibiotic resistance, infection, immune reactions and microbiological and immunological diagnostic methods.

Course learning outcomes

The student should acquire knowledge about the basic biological characteristics of pathogenic and non-pathogenic microorganisms, about infection and immune reactions to antigens. Furthermore, the student should be able to perform material sampling for microbiological diagnostics, determine the shape and structure of microorganisms as well as to identify bacteria and fungi in native and colored preparations. The student should know how to perform sterilization, isolate bacteria in pure culture, perform their identification and to examine antibiotic susceptibility. The student should be able to perform serological reactions and interpret the obtained results, to set up tissue culture, perform virus inoculation and recognize the appearance of cytopathic effect, to inoculate embryonated chicken eggs with viruses, rickettsia and chlamydia, to stain preparations from allantochorionic and vitellus membranes, to prepare and stain brain tissue preparations to detect Negri bodies.

Course content

Formal lecture

Introduction to microbiology. Shape and structure of microorganisms. Ecology of microorganisms. Physiology of microorganisms. Microorganisms in nature. Microorganisms as means of biological warfare. Genetics of microorganisms. Immunity and immune reactions. Infection and resistance to infection.

Practicals

Use of microscope in microbiology. Basic forms of bacteria. Basic forms of fungi. Instruments and labware, washing and preparation for work. Sterilization in microbiology. Bacteriological growth media. Preparation of microscopic slides. Staining procedures. Gram and Giemsa staining. Staining of bacterial spores and capsules. Colony identification and obtaining pure cultures of bacteria. Cultural characteristics of microorganisms. Physiological and biochemical characteristics of microorganisms. Antibiotic susceptibility testing of isolated bacteria to antibiotics. Identification of microorganisms using serological reactions and basic molecular biology techniques.

DON (additional forms of teaching)

SIR (study research work)

Literature

1. Milić N., Krnjaić D., Mišić D., Nišavić J., Radojičić M. (2017) Mikrobiologija sa imunologijom, Naučna KMD, Beograd.

2. Krnjaić D., Milić N., Nišavić J., Radojičić M., Radalj A. (2023) Priručnik sa praktičnim vežbama iz mikrobiologije sa imunologijom 1 i mikrobiologije sa imunologijom 2, Naučna KMD, Beograd.

Class hours per week	**Formal lecture: 3**	**Practicals : 3**

Teaching methods

Formal lecture, practical laboratory work.

Evaluation/Grading (maximum 100 points)

Grading: 6 = 51-60 points, 7 = 61-70 points, 8 = 71-80 points, 9 = 81-90 points, 10 = 91-100 points.

Pre-exam requirements	Points	**Final exam**	Points
Participation in formal lecture	10	Written exam	10
Participation in practicals		Oral exam	50
Colloquium	30		

Seminars			
The knowledge assessment methods: colloquium, written exam, oral exam			