

Faculty of Medicine / HIGHER MEDICAL SCHOOL / MICROBIOLOGY WITH PARASITOLOGY

Course:	MICROBIOLOGY WITH PARASITOLOGY			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
10283	Mandatory	2	3.5	3+2+0
Programs	HIGHER MEDICAL SCHOOL			
Prerequisites	It does not exist			
Aims	Studying microorganisms, understanding their pathogenic effect, and getting to know the possibilities of controlling their transmission in outpatient and hospital conditions			
Learning outcomes	Students will acquire basic knowledge about microorganisms that are important in human medicine due to their ability to cause human diseases, about the ways of their pathogenic effect on the human body, about the possibilities of their transmission in outpatient and hospital conditions and measures that can be used to control that transmission. After completing the lesson, the student will: know the difference between the normal flora of the human body and pathogenic microorganisms, know the characteristics of the most common causes of various infections that affect people, be able to properly take different clinical samples from the patient, properly store and transport them to the microbiological laboratory. The student will become familiar with: the mode of action of antibiotics, the mechanisms of bacterial resistance to antibiotics and the key factors that lead to the development of that resistance. The student will have knowledge about the proper implementation of hand hygiene and other measures important for the control of hospital infections and the possibilities of protection against professional exposure to blood-borne infections. They will be able to use this knowledge in their daily work in order to recognize and control infections.			
Lecturer / Teaching assistant	Prof. Gordana Mijović Assistant Borko Maraš			
Methodology	Lectures, exercises, seminars, consultations			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction to microbiology, Bacterial cell structure, Growth and reproduction of bacteria			
I week exercises	Rules of conduct in the microbiological laboratory. Aseptic work			
II week lectures	Genetics of bacteria, Interaction: man - bacteria			
II week exercises	Observation of bacterial cultures on bacteriological nutrient media: Gram "+" bacteria (on a blood agar plate); Gram "-" bacilli (on blood agar plate and Endo agar plate)			
III week lectures	Antibiotics: mechanism of action, mechanisms of bacterial resistance. The problem of resistance - evolution and current state			
III week exercises	Methods of antibiotic susceptibility testing: diffusion and dilution method Independent work: reading growth inhibition zones on agar plates			
IV week lectures	Nosocomial infections Disinfection and sterilization Hand hygiene			
IV week exercises	Nosocomial infections: contact isolation measures Independent work: application of contact isolation measures in patient rooms			
V week lectures	Sampling and sending clinical samples for microbiological investigation Gram + cocci: Staphylococcus aureus, Streptococcus pyogenes, Streptococcus pneumoniae; Gram "-" cocci: Neisseria meningitidis; Haemophilus			
V week exercises	Independent work: turning on the autoclave and dry sterilizer, physical and chemical methods of sterilization control, keeping records on sterilization control.			
VI week lectures	Enterobacterales: Salmonella, Shigella, Escherichia coli; Helicobacter, Campylobacter, Vibrio cholerae			
VI week exercises	Hand hygiene Independent work: application of hand hygiene rules when working with patients			
VII week lectures	Clostridium, Bacillus anthracis Mycobacterium tuberculosis, Non-fermentative bacteria: Acinetobacter, Pseudomonas			
VII week exercises	Sampling and sending clinical samples for bacteriological analysis Independent work: throat, nose, wound, blood swab sampling			
VIII week lectures	Structure of viruses, Replication of viruses, Interaction between viruses, Relationship between viruses and cells, Pathogenesis of viral infections			
VIII week exercises	Observation of cultures of staphylococci, beta hemolytic streptococci, alpha hemolytic streptococci, preparation and observation of microscopic slides from cultures			

IX week lectures	Picornaviridae, Caliciviridae, Reoviridae, Adenoviridae Orthomyxoviridae, Paramyxoviridae
IX week exercises	Observation of enterobacteria cultures. Observation of bacterial smear preparations
X week lectures	Herpesviridae: Cytomegalovirus, Epstein Barr virus; Poxviridae, Bunyaviridae
X week exercises	Sampling and sending samples for virological analysis
XI week lectures	Structure of fungi, Biology and physiology of fungi, Antimycotic action mechanisms Causative agents of superficial mycoses, Candida
XI week exercises	Sampling and sending samples for mycological analysis
XII week lectures	Structure, biology and physiology, reproduction, life cycles and pathogenicity of protozoa and helminths <i>Lamblia intestinalis</i> , <i>Entamoeba histolytica</i> , <i>Leishmania donovani</i> ; <i>Taenia</i> , <i>Echinococcus granulosus</i> , <i>Ascaris lumbricoides</i> , <i>Enterobius vermicularis</i> , <i>Trichinella spiralis</i>
XII week exercises	Observation of yeast and mold cultures. Observation of smear of culture preparations
XIII week lectures	The most common causes of sexually transmitted infections: Chlamydia trachomatis, Neisseria gonorrhoeae, Treponema pallidum, genital mycoplasmas, HIV, Herpes simplex virus, Human papilloma viruses, Hepatitis B virus, Trichomonas vaginalis
XIII week exercises	Sampling and sending samples for parasitological analysis
XIV week lectures	Hepatotropic viruses: Hepatitis A virus, Hepatitis B virus, Hepatitis C virus, Hepatitis D virus, Hepatitis E virus
XIV week exercises	Diagnostics of intestinal and tissue protozoa. Diagnostics of helminths. Observation of ready-made microscopic stained preparations of protozoa
XV week lectures	Prevention of professional exposure of healthcare workers to blood-borne infections (pre- and post-exposure prophylaxis)
XV week exercises	PEP: application of measures to protect against blood-borne infections. Correct putting on and taking off personal protective equipment
Student workload	In the semester Classes and final exam: $(4.66 \text{ hours}) \times 16 = 74.56 \text{ hours}$ Necessary preparations before the beginning of the semester (administration, registration, certification): $(4.66 \text{ hours}) \times 2 = 9.32 \text{ hours}$ Total workload for the course: $3.5 \times 30 = 105 \text{ hours}$ Load structure: 74.56 hours (classes and final exam) + 9.32 hours (preparation) + 21 hours (supplementary work)

Per week

3.5 credits x 40/30=4 hours and 40 minuts

3 sat(a) theoretical classes

0 sat(a) practical classes

2 excercises

-1 hour(s) i 40 minuts

of independent work, including consultations

Per semester

Classes and final exam:

4 hour(s) i 40 minuts x 16 =74 hour(s) i 40 minuts

Necessary preparation before the beginning of the semester (administration, registration, certification):

4 hour(s) i 40 minuts x 2 =9 hour(s) i 20 minuts

Total workload for the subject:

3.5 x 30=105 hour(s)

Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item)

21 hour(s) i 0 minuts

Workload structure: **74 hour(s) i 40 minuts (cources), 9 hour(s) i 20 minuts (preparation), 21 hour(s) i 0 minuts (additional work)**

Student obligations

regular attendance at lectures and exercises

Consultations

Literature

Branislava Savić, Sanja Mitrović, Tanja Jovanović i sar. Medicinska mikrobiologija. Medicinski fakultet Univerziteta u Beogradu, 2020. Ivan Ilić. Higijena ruku, Nacionalne smjernice dobre kliničke prakse. Ministarstvo zdravlja Crne Gore, 2012. Mijović G., Rokočević B., Milanović M. Preporuke za prevenciju profesionalne izloženosti zdravstvenih radnika infekcijama koje se prenose krvlju. Institut za javno zdravlje, Podgorica, 2007. Grupa autora. Praktikum iz mikrobiologije i imunologije. Urednik: Tanja Jovanović, Savremena administracija, Beograd, 2000.

Examination methods