

**DISCIPLINE SHEET****ACADEMIC YEAR****2022-2023****1. DATA ABOUT THE STUDY PROGRAM**

1.1 Institution of higher education	UNIVERSITY OF MEDICINE AND PHARMACY OF CRAIOVA
1.2 Faculty	<b>MEDICINE</b>
1.3 Department	2
1.4 Study Domain	HEALTH
1.5 Study cycle	LICENCE
1.6 Study program/ Qualification	MEDICINE

**2. DATA ABOUT THE DISCIPLINE**

2.1 DISCIPLINE NAME	<b>BACTERIOLOGY</b>		
2.2. Discipline code	MED21206		
2.3 The holder of course activities	Bălăsoiu Maria, Ungureanu Anca Marilena, Cristea Oana, Zlatian Ovidiu Mircea		
2.4 The holder of seminar activities	Bălăsoiu Maria, Ungureanu Anca Marilena, Cristea Oana, Zlatian Ovidiu Mircea, Ghenea Alice, Boldeanu Lidia, Mititelu Răzvan		
2.5. Academic degree	Course: Professor, Conferentiary, Lecturer, Lecturer, Assistant, Seminar activities: Professor, Conferentiary, Lecturer, Lecturer, Assistant, Assistant		
2.6. Employment (base norm/associate)	Base norm		
2.7. Year of study	<b>II</b>	2.8. Semester	<b>I + II</b>
2.9. Course type (content)		2.10. Regime of discipline (compulsoriness)	
		<b>CFD</b>	

**3. THE ESTIMATED TOTAL TIME (teaching hours per semester)**

3.1 Number of hours per week:	<b>4</b>	3.2 from which: course	<b>2</b>	3.3 seminary/laboratory	<b>2</b>
3.4 Total hours in curriculum:	<b>112</b>	3.5 from which: course	<b>56</b>	3.6. seminary/laboratory	<b>56</b>
Time found distribution (hours)					
Study from manual, course support, bibliography, and notes					<b>40</b>
Additional documentation in the library, specialized electronic platforms and, on the field					<b>8</b>
Training seminars / labs, homework, reports, portfolios, and essays					<b>8</b>
Tutoring					<b>2</b>
Examinations					<b>4</b>
Other activities, counselling, student scientific programs					<b>1</b>
3.7 Total hours of individual study	<b>63</b>				
3.9 Total hours per semester					
Semester I	<b>100</b>				
Semester II	<b>75</b>				
3.10 Number of credits					
Semester I	<b>4</b>				
Semester II	<b>3</b>				

**4. PREREQUISITES** (where appropriate)

4.1 curriculum	Students must have solid knowledge of anatomy, biochemistry, and molecular biology.
4.2 competency	-

**5. CONDITIONS** (where appropriate)

5.1. of course deployment	Lecture room / online environment
5.2. of seminary/ lab deployment	Laborator room / online environment

**6. SPECIFIC COMPETENCES ACCRUED**

<b>PROFESSIONAL COMPETENCES</b>	<p><b>C1.</b> Identification of bacterial-fungal agents involved in infectious diseases and establishment of bacteriological/ mycological diagnosis based on laboratory investigations.</p> <p><b>C2.</b> Correct assessment of the risk of transmission of bacteria/ fungi and the occurrence of an individual/ collective disease, followed by the choice and application of appropriate prophylaxis measures.</p> <p><b>C3.</b> The correct choice of antibiotics used in the treatment of infectious diseases with bacterial and fungal etiology, depending on the reading and interpretation of the antibiogram. Approaching the health/ disease problems from the perspective of the particularities of the community, in direct relation with the social, economic and/ or cultural conditions proper to that community.</p> <p><b>C4.</b> Initiation and development of a scientific and/ or formative research activity in the field of bacteriology- mycology.</p>
<b>TRANSVERSAL COMPETENCES</b>	<p><b>CT1.</b> Autonomy and responsibility</p> <ul style="list-style-type: none"> <li>• the acquisition of moral reference points, the formation of professional and civic attitudes, that will allow to the students to be fair, honest, helpful, understanding, unconflictuals, to cooperate and to be comprehensive in the face of suffering, to be available to help people, and to be interested in community development;</li> <li>• to know, to respect and to contribute to the development of moral values and professional ethics;</li> <li>• to learn how to recognize the problems when they arise, and provide solutions for solving them.</li> </ul> <p><b>CT2.</b> Social interaction</p> <ul style="list-style-type: none"> <li>• to recognize and to have respect for diversity and multiculturalism;</li> <li>• to have or to learn how to develop teamwork skills;</li> <li>• to communicate orally and in writing the manner of work requirements, the obtained results, to consult with the team;</li> <li>• to engage themselves in voluntary activities, to know the essential problems of the community.</li> </ul> <p><b>CT3.</b> Personal and professional development</p> <ul style="list-style-type: none"> <li>• to have opening to lifelong learning,</li> <li>• to be aware for self-study as a basis of personal autonomy and professional development;</li> <li>• to derive the optimum and creative potential in their own collective activities;</li> <li>• to know how to use information and communication technologies.</li> </ul>

#### 7. DISCIPLINE OBJECTIVES (based on the grid of specific competences acquired)

7.1 The general objective of the discipline	<ul style="list-style-type: none"> <li>- Preparing students for knowledge oh the etiology and pathogenetic mechanisms of human diseases with infectious etiology, which will be studied in disciplines as: infectious diseases, internal medicine, surgery, obstetrics and gynecology, pediatrics, dermatology and venereology.</li> <li>- Formation of biological thinking to create the premises for students of understanding other preclinical and clinical disciplines.</li> <li>- Study of major bacterial and fungal pathogenic genera and species, involved in human pathology and surgical care.</li> <li>- Knowledge of normal and pathological human microbiota.</li> <li>- Knowledge of methods of prevention, treatment and control of human bacterial and mycotic infections.</li> </ul>
7.2 The specific objectives of the discipline	<p>At the end of the study program, based on the curriculum adapted to European quality standards, through the teaching and assessment methods used, students must have the following cognitive skills and practical skills:</p> <p><b>COGNITIVE SKILLS</b></p> <ul style="list-style-type: none"> <li>- to describe the morphology and metabolism of microorganisms (bacteria, fungi);</li> <li>- to know the mechanisms of the infectious process related to the pathogenicity of bacteria-fungi and the defense mechanisms of the organism;</li> <li>- to be able to distinguish the pathogenic bacterial / fungal agents from the pathogenic and non-pathogenic conditioned ones from all the bacteria / fungi;</li> <li>- to know the structure and the mode of action of antibacterial and antifungal chemotherapeutics on bacteria / fungi;</li> <li>- to know the non-specific and specific means of defense of the human body against bacterial / fungal agents;</li> <li>- to have notions about active and passive immunoprophylaxis of bacterial / fungal infections.</li> </ul> <p><b>PRACTICAL SKILLS</b></p> <ul style="list-style-type: none"> <li>- to know the methods used in the laboratory diagnosis of infectious diseases (bacteriological and mycological diagnosis). Learning the principles of sampling, transport and processing of samples for laboratory examination.</li> <li>- to know the principles of cultivation and identification of microorganisms.</li> <li>- to be able to read and interpret the microbiological analysis bulletin with the clinical significance of a possible pathogen and the choice of the appropriate treatment depending on the result of the antibiogram.</li> </ul>

## 8. CONTENTS

<b>8.1 COURSES (CONTENT UNITS)</b>	<b>56 hours</b>
<b>Semester I. GENERAL BACTERIOLOGY</b>	<b>28</b>
1. Definition of medical microbiology. Historic. Bacterial taxonomy.	2
2. Bacterial morphology. Chemical composition of bacteria. Bacterial division. Spore and sporulation.	2
3. Bacterial metabolism. Bacterial growth and multiplication.	2
4. The action of physical, chemical and biological agents on bacteria. Antiseptics, disinfectants, preservatives.	2
5. Bacterial genetics (I): bacterial chromosome, extracromosomal genetic formations, bacterial variability, genetic mutation.	2
6. Bacterial genetics (II): transformation, conjugation, transduction, transfection; the practical importance of studying bacterial genetics.	2
7. Antibacterial chemotherapy (I): definition, classification, spectrum of action, mechanisms of action of the main chemotherapeutic groups.	2
8. Bacterial chemotherapy (II): resistance of bacteria to chemotherapies, installation mechanisms and ways to avoid chemotherapy resistance.	2
9. Bacterial chemotherapy (III): applications in medical practice, general principles of antibiotic treatment. Methods for determining the main mechanisms of resistance to antibiotics and multi-resistant bacterial phenotypes. Notions of multidrug resistance, panresistenta.	2
10. Infectious process (I): definition, types of infections, stages of infection, ways of evolution of infection.	2
11. Infectious process (II): pathogenicity factors of bacteria, virulence, exo and endotoxins.	2
12. Ecological microbiology: ecological relations microorganism-microorganism and microorganism-macroorganism; the normal flora of the body. Microbiome. The bacterial biofilm.	2
13. Nonspecific and specific defense in bacterial infections. Defense mechanisms.	2
14. Active and passive prophylaxis. Immunomodulators, immunomodulators.	2
<b>Semester II. SPECIAL BACTERIOLOGY. MYCOLOGY</b>	<b>28</b>
1. Staphylococcus genus. Streptococcus genus.	2
2. Neisseria genus. Diphtheria Bacil. Tuberculous Bacillus and other mycobacteria.	2
3. Enterobacteria. (General). Pathogenic Enterobacteria (I): Shigella genus. Salmonella genus	2
4. Pathogenic Enterobacteria (II): Vibrio genus. The genre Yersinia.	2
5. Pathogenic Enterobacteria: Proteus genus. Gen Klebsiella. Enterobacter genus. Genre Serratia. Providencia genus. The Morganella genus. The genus Citrobacter. Helicobacter pylori.	2
6. Gram-negative glucose-nonfermentative bacteria. The genus Pseudomonas. The genus Acinetobacter. The genre Burkholderia. The genus Stenotrophomonas.	2
7. Parvobacteria: Haemophilus, Bordetella, Brucella. The Moraxella genus. Legionella genus.	2
8. Spore-forming aerobic bacteria: Bacillus genus. Bacillus anthracis. Bacillus cereus	2
9. Non-spore-forming anaerobic bacteria: Peptococcus, Peptostreptococcus, Veillonella, Prevotella, Bacteroides, Fusobacterium, Actinomices, Bifidobacterium, Eubacterium, Mobiluncus, Propionibacterium, Lactobacillus, Listeria	2
10. Spore anaerobic bacteria: Clostridium genus: Clostridium gangrene, Clostridium tetani, Clostridium botulinum, Clostridium difficile	2
11. Spirili - Spirochete: The Treponema genus. The Leptospira genus. Borellia genre.	2
12. Rickettsii, Chlamydi, Mycoplasme, Ureaplasme	2
13. Healthcare associated infections (nosocomial) : definitions, classification, epidemiology, prophylaxis.	2
14. Superficial and profound fungal agents (Candida albicans, Pneumocystis (jiroveci) carinii , Cryptococcus neoformans, Aspergillus, Tricophyton, Epidermophyton).	2
REFERENCES	
1.Turculeanu Adriana, Rosu Lucica, Zlatian Ovidiu – “Medical bacteriology”, Ed. Sitech, Craiova, Romania, 2014.	
<b>8.2 Practical laboratory (topics / themes)</b>	<b>56 hours</b>
<b>SEMESTER I</b>	
<b>GENERAL BACTERIOLOGY</b>	<b>28</b>
1. Organization and operation of the medical microbiology laboratory. Specific Labor Protection Standards in the Microbiology Laboratory	2
2. Microscopy. Sterilization and disinfection of laboratory materials: methods, control, efficiency	2
3. Harvesting, transport and processing of pathological products	2
4. Isolation of bacteria "in vitro" and "in vivo". Methods of isolation and sowing. Culture media	2
5. Identification of bacteria based on morphological characters; bacterial smear	2
6. Identification of bacteria based on cultured characters on liquid and solid media	2
7. Identification of bacteria based on metabolic characters	2
8. Identification of bacteria based on pathogenicity (in vivo and in vitro)	2
9. Identification of bacteria based on antigenic characters (serological identification)	2

10. Identification of bacteria based on bacteriophage sensitivity, bacteriocinotype	2
11. Antibodies. Diffusive method and dilution method in liquid medium and agar. E-test method. The "breakpoints" method. Methods of molecular biology used in the detection of bacterial infections	2
12. Immunobiological diagnosis (I): serological diagnosis (by agglutination, precipitation, complement fixation, immunofluorescence)	2
13. Immunobiological diagnosis (II): ELISA, ECLIA, ELFA, RIA and cell immunity tests	2
14. Recapitulations. Restorations.	2
<b>SEMESTER II.</b>	<b>28</b>
<b>SPECIAL BACTERIOLOGY</b>	
1. Laboratory diagnosis of staph infections and streptococci infections	2
2. Laboratory diagnosis of infections with: pneumococcus, meningococcus, gonococcus	2
3. Laboratory diagnosis of Mycobacterium tuberculosis and Corynebacterium diphtheriae infections	2
4. Laboratory Diagnosis of Intestinal Bacterial Infections (I): generalities. The laboratory diagnosis of E. coli infections, Shigella	2
5. Laboratory diagnosis of intestinal bacterial infections (II): Laboratory diagnosis of infections with: Salmonella, Yersinia	2
6. Laboratory diagnosis of intestinal bacterial infections (III): Vibrio cholerae, Helicobacter pylori	2
7. Laboratory diagnosis of intestinal bacteria (IV) infections: Proteus, Morganella, Providencia, Serratia, Klebsiella, Citrobacter, Enterobacter	2
8. Laboratory diagnosis of Gram-negative Gram-negative fertility: Pseudomonas, Acinetobacter, Stenotrophomonas, Burkholderia	2
9. Laboratory diagnosis in Parvobacteria infections and Bacillus genus	2
10. Laboratory diagnosis of unsorted and sporulated anaerobic germ infections	2
11. Laboratory diagnosis in treponema and leptospire infections	2
12. Laboratory diagnosis in Rickettsii, Chlamydia, Mycoplasma, Ureaplasme infections	2
13. Laboratory diagnosis of superficial and deep mycoses (Candida, Aspergillus, Trycophyton, Pneumocystis jiroveci). Microbiological laboratory diagnosis of normally sterile and normally contaminated products	2
14. Recapitulation. Recoveries	2
<b>REFERENCES</b>	
1.Zlatian Ovidiu, Turculeanu Adriana, Rosu Lucica – “Practical guidebook of bacteriology”, Ed. Sitech, Craiova, Romania, 2014.	

**9. CORROBORATING THE DISCIPLINE CONTENT WITH THE EXPECTATIONS OF EPISTEMIC COMMUNITY REPRESENTATIVES, PROFESSIONAL ASSOCIATIONS AND EMPLOYEE REPRESENTATIVES RELATING TO THIS PROGRAM**

<p>Microbiology is a fundamental discipline required for a student to become a doctor. Knowledge, practical skills and attitudes learned in this discipline provide the basis for performing the medical act of etiologic diagnosis of infectious diseases based on objective clinical examination and laboratory investigations.</p> <p>Theory and practical knowledge enables understanding of disease pathogenesis caused by bacterial, viral, parasitic and fungal agents. The results of laboratory investigations specific to etiology help in monitoring the disease progression and therapeutic option with beneficial effect on patient health</p>
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**10. METHODOLOGICAL LANDMARK**

Types of activity	Techniques of teaching / learning materials and resources: lecture, interactive group work, brainstorming, learning problems / projects etc.
Course	Teaching based on imaging support (video projector), lecture, heuristic conversation, debate, clinical problems
Practical work	Practical demonstrations, dialogue, presentation of macroscopic and microscopic preparations, control of acquired knowledge, practical applications, problem solving, heuristic conversation
Individual study	The students are gave guidelines about organizing the study time, learning techniques, working memory training and avoiding procrastination.

In special situations (alert state, emergency state and other types of situations which limit the physical presence of people) the activity ca be done also online by using computer platforms agreed by the university. The online educational process will be adapted to ensure the accomplishment of all objectives from the discipline sheet.

**11. RECOVERY PROGRAM**

	No. absences that can recover	Location of deployment	Period	In charge	Scheduling of topics
Absences recoveries	3	Discipline Headquarters/ Online environment	End of Semester	Teaching staff of the discipline	Depending on the absences

Schedule consultations Students' circle	2 hours/ week	Discipline Headquarters/ Online environment	Weekly	Teaching staff of the discipline	According to the internal schedule
Program for students poorly trained	4 hours/ semester	Discipline Headquarters/ Online environment	Last two weeks	Teaching staff of the discipline	Achievement of specific objectives
<b>12. ASSESMENT</b>					
<b>Activity</b>	<b>Types of assesment</b>		<b>Method of evaluation</b>		<b>Percentage from final grade</b>
<b>Lecture</b>	Formative assesment during the semester Summative assesment during the exam		Exam(oral)/sistem"face to face" with online video plat- form		<b>75%</b>
<b>Practical work</b>	Formative assesment during the semester Periodic assesment during the semester, Summative assesment in the last week of the semester		Exam(oral)/sistem"face to face" with online video plat- form		<b>15%</b>
<b>Periodic assesment</b>					5%
<b>Assesment of individual activities</b>					5%
<b>Minimum performance standard</b>					at least 50% for each component of the evalua- tion
<b>13. GUIDANCE AND COUNSELLING PROGRAMS</b>					
<b>Professional guidance and counselling programs (2 hours/monthly)</b>					
<b>Scheduling the hours</b>			<b>Location</b>		<b>In charge</b>
Last Friday of every month			Discipline headquarters		Teaching staff of the discipline

**Endorsement date in the department: 27.09.2022**

**Department Director,  
Prof. Eugen OSIAC**

**Coordinator of study program,  
Prof. Marius Eugen CIUREA**

**Discipline holder,  
Prof. Maria BĂLĂȘOIU**