MED 4014 ANTIMICROBIAL DRUGS and RESISTANCE

Course Name	Code	Semester	Type of course	Theory (hours)	Application (hours)	ECTS
ANTIMICROBIAL DRUGS and RESISTANCE	MED 4014	VIII	Elective	10	16	2
Faculty, the educational program and education level	Medical Faculty, one-cycle (6-years duration) Program "Medicine"					
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Educatıonal course format	LECTURE, LABORATORY, GROUP WORK					
Educatıonal course volume	**Total:** 60 acad. hours **Contact hours**: 30 h 1. Lecture – 10 h 2. Laboratory -6 h 3. Group work – 10 h 4. Midterm Exam – 2 h 5. Final Exam -2 h **Independent work** – 30 h					
Prerequisites	MED 3011					
The purpose (s) of tutorial course/modules	This course is designed to give students an understanding of mechanisms of action and resistance to antimicrobial, antiviruses, antifunfial agents; interpretation of antibiotics susceptibility mechanism; practical importance of antibiotics sensitivity investigation laboratory methods and data interpretation.					
Teaching and learning strategy	**Lectures will be conducted** based on the application of verbal explanation method, demonstration- the method of visual presentation of the information. **Laboratory work** foresees doing experiments by the students themselves under the teacher's supervision that aims at elaboration of practical clinical skills; the students will also analyze the obtained results. In order to develop the skills of making conclusions supported by the arguments the students, during the **group work,** will defend and justify their opinions, when dealing with situation analysis,					

	and analyze critically the situation created by their course mate. The students will also carry out the analysis of the clinical cases, interpret, classify, assess the data and make synthesis by means of connecting and confluencing of the components comprising the separate issues. **When working on the project** the student will use the method of working on the book**.** Besides he/she has to get familiarized with publications, process the literature, search for the additional material and present the project in slideshow format. .
Assessment criteria	**Maximum score- 100** **Final Exam – 40 points** **Other components of midterm assessment are (total 60):** • Attendance on lectures - 1 point (1X10=10); • Activity on Laboratory – 10 points: • Activity on group work -10 points; • Project preparation and presentation -10 points; • **Midterm Exam – 20** points **Laboratory Work is assessed based on the following criteria (**maximum 5 point): **10-9 points**: Laboratory method is planned correctly, the usage of the laboratory equipment and devices by the student is accurate. The student is able to make method recording correctly, can easily identify the mistakes made and plan the way of correction. The student is able to analyze the method exercised and interpret the results. Laboratory work is carried out accurately and completely; **4 points:** Laboratory method is planned correctly. The student reveals the relevant knowledge when applying laboratory equipment and devices. The student is able to make method recording correctly, easily identify the mistakes made and plan the way of correction, however, has difficulties in analyzing the results. Laboratory work is performed with minor faults. **3 points:** Laboratory method is planned correctly. The student is not able to reveal the relevant knowledge when using the laboratory equipment since he/she makes minor mistakes when applying laboratory devices; The student can make method recording correctly but is not able to detect the mistakes made and experiences difficulties in looking for the ways of correction. Laboratory work is carried out with minor faults. **2 points:** Minor mistakes are made in planning of the laboratory method; the student is not able to reveal the relevant knowledge when using laboratory equipment and devices, is able to make method recording correctly but is not able to detect the mistakes made and relevantly has difficulties in finding the way of correction. Laboratory work is carried out with essential faults. **1 point**: Essential mistakes are made in planning laboratory method; the student is hardly familiar with the rules of usage of laboratory equipment and devices; the student is able to make method recording but is unable to detect the mistakes made and relevantly has difficulties in finding the ways of correction. Laboratory work is carried out with essential faults. **0 point:** the student is absolutely unaware of laboratory method and equipment and devices. The task is not fulfilled. **Group Work assessed based on the following criteria** (maximum 10 point) **10 points** - Student has been able to present complete and thorough knowledge of the subject, a substantial amount of detailed and relevant information. Demonstrate considerable depth of understanding of the studied main and additional literature. Bring forward a balanced view of the main arguments on the issues.

	9 points - Student has been able to bring forward a consistent number of deductions on most of the topics tackled. make very good comments on the different perspectives on most of the issues. Demonstrates knowledge of the main readers. **8 points** - Student has been able to bring forward a consistent knowledge, Has properly developed terminology. Demonstrates knowledge of the main readers. **7 points** - Student has been able to present some factual information sufficiently linked with the topic. demonstrate a good understanding of the topics selected. make a good attempt to bring forward a balanced view of some arguments on the issues. Terminology is partially developed. **6 points** - Student has been able to make some good comments on the different perspectives on some of the issues. Make poor deductions on most of the topics tackled. analyse some causes and results of human interactivity related to the issues. **5 points** - Student has been able to demonstrate inconsistent comments on the different perspectives on some of the issues. Terminology is partially developed. Present mediocre level of knowledge. Make poor deductions. **4 points** - Student demonstrates general overview of the topics. Terminology is not developed. Information sufficiently linked with the topic. Demonstrate irrelevant understanding of the literature. **3 points** – Student demonstrates general/superficial and inconsistent knowledge of the subject. No sufficient knowledge of the literature. **2 points** - Student demonstrates general comments, no knowledge of the terminology, no consistency. **1 point** – Student demonstrates insufficient answer, not terminology awareness, chronologic manner of the answer, mostly wrong, no knowledge of literature. **0 point -** Student demonstrates not even elementary knowledge of the topics. **Project preparation – presentation criteria (max. 10p)** 1. Problem Importance - 1 p; 2. Proper planning - 1 p; 3. Review of the literature (data) on the issue - 1 p; 4. Relevance of research methods with the research goal - 1 p; 5. Deductions accuracy and correlation with the main text - 1 p; 6. Accuracy of the cited literature, trusted sources - 1 p; 7. Writing accuracy -1 p; 8. Language and style accuracy – 1p; 9. Visual and technical sides of the material - 1 p; 10. Culture of dispute and listening - 1 p. **Midterm exam** is a test (multiple choice) that contains 40 questions, each rated 0.5point. The student is allowed to pass the final exam, if he accumulates not less than 11 points for the mid-term evaluations (considering that he will get the maximum score at the final exam). **Final exam** is also the test (both open and closed questions). It consists of 80 open and closed multiple-choice questions; each one rates 0.5 p (40 p in total) **Final exam is scored with not more than 40p.** The final exam is considered to be passed if a student accumulates **70% or more** of the maximum exam score (40X70 / 100 = 28 points). Credit is awarded to if student accumulates 51 p out of 100 p. **Positive assessment:** • (A) Excellent - 91 points and more;

	• (B) Very good - 81-90 points; • (C) Good - 71-80 points; • (D) Satisfactory - 61-70 points; • (E) Enough - 51-60 points; **Negative assessment:** • (FX) didn't pass - 41-50 points that means that student needs more work to pass it and is allowed to pass additional exam; • (F) failed – 40 points or less that means that student shall take the course again. The student has the right to pass an examination in the same semester. The interval between the final and additional exams to be not less than 10 days.
The basic literature	1. Lorian V. **Antibiotics in Laboratory Medicine**, 5th. Ed., Lippincott, Williams and Wilkins, Philadelphia, PA, USA. 2005.
The auxiliary literature	1. White DG, Alekshun MN, McDermott F. **Frontiers in Antimicrobial Resistance.** ASM Press, Washington, DC, USA. 2005; 2. Bryskier A. **Antimicrobial Agents: Antibacterials and Antifungals**. ASMPress, Washington, DC, USA. 2005;

The tutorial/learning course content

N	Topics	Lecture (hour)	Work in group Appl. (hour)	Lab
1	Mechanism of action of antibacterial agents. Mechanism of resistance to antibacterial agents	2	2	1
	Antibiotic resistance in gram positive bacteria, Antibiotic resistance in gram negative bacteria	2	2	1
	Midterm Exam		2	
	Mechanism of action of antibacterial agents, Antibiotic susceptibility testing methods	2	2	1
	Antifungal suceptibility testing methods and Antifungal succeptibility profiles of commanly encountered fungal pathogens.	2	2	2
	Antifungal agents: Mechanisms of action and resistance	2	2	1
16-19	**Final Exam**		2	

Learning Outcomes

Criteria	Competences
Knowledge and understanding	At the ent of this learning course studrnt will have the deep and systematic knowledge about: • the latest antibacterial drugs, used in modern micribiology; • their mechanism of action and research methods; • the latest scientific achievements in the field of resistance formation
Knowledge applying	Student will be able to: • describe the possible result of the antimicrobial drugs influence, their action mechanisms; • perform the antibiotics sensitivity test, interpret the received results for the of antibiotic therapy determination. • select properly and optimally the laboratory diagnostic methods with correct interpretation of test results for everyday life in practical use.
Making Judjment	Student will be able to analyse the laboratory data on the base of laboratory methods and devices knowledge and practical skills; to determine error and to make the appropriate conclusion
Value	Aware of the threats of antibiotic-resistance drugs, can evaluate their actions. Is able to assess his/her attitude and contribute in the process in forming new values;