Course Plan

Number of students: 8

Semester: First

Year: 2025

Department: Medical Bacteriology

Major: Master's Degree in Medical Microbiology

Credit: 1.5

Course Title: Antimicrobial Agents

Course Type: Theoretical and Practical

Day & Time: Sunday and Tuesday, 8:00-10:00

Prerequisite: General Microbiology

Instructor: Dr. Milad Shahini

Email: [shahini.m@skums.ac.ir]

Office Address: Faculty of Medicine, Shahrekord University of Medical Sciences

Response Hours and Days: Saturdays to Wednesdays, 8:00–15:00

Main Objective:

To understand various antimicrobial agents, their classifications, mechanisms of action, bacterial resistance, and laboratory methods for evaluating antimicrobial susceptibility.

Learning Outcomes:

- Classify antimicrobial agents and describe their mechanisms of action.
- Understand physical and chemical agents used in microbial control.
- Explain mechanisms of bacterial resistance and identify beta-lactamases.
- Apply CLSI standards and interpret M100 tables.
- Prepare bacterial suspensions and antibiotic dilutions.
- Perform disk diffusion and interpret inhibition zones.
- Conduct Broth Microdilution and Macrodilution methods for MIC/MBC.
- Use automated systems (Vitek, MicroScan) and E-test for susceptibility testing.

References (Textbooks):

- "Antimicrobial Chemotherapy," by Finch et al.

- "Manual of Clinical Microbiology," by ASM Press.
- CLSI M100 Performance Standards for Antimicrobial Susceptibility Testing.
- Latest peer-reviewed articles provided during the course.

Student Evaluation and Weight:

- Attendance and Participation: 3 marks
- Practical Performance: 5 marks
- Midterm Exam: 6 marks
- Final Exam: 6 marks
- Total Marks: 20

Students Responsibilities:

- Attend all theoretical and practical sessions.
- Actively participate in laboratory work and group discussions.
- Adhere to lab safety protocols and CLSI guidelines.
- Unexcused absences may lead to loss of marks.

Discipline and Educational Rules:

The course folloxws the Ministry of Health and Medical Education policies and university regulations.

Course Schedule:

Session	Date	Topic	Instructor
1	[2025/04/06]	Classification of antimicrobial agents	Dr. Milad Shahini
2	[2025/04/08]	Physical agents and mechanisms: heat, radiation, freezing, drying, filtration	Dr. Milad Shahini
3	[2025/04/13]	Chemical agents and mechanisms: antiseptics, disinfectants	Dr. Milad Shahini
4	[2025/04/15]	Classification and mechanisms of antibiotics	Dr. Milad Shahini
5	[2025/04/20]	Mechanisms of bacterial resistance	Dr. Milad Shahini

6	[2025/04/22]	Introduction to beta-lactamases	Dr. Milad Shahini
7	[2025/04/27]	CLSI guidelines and M100 interpretation criteria	Dr. Milad Shahini
8	[2025/04/29]	Preparation of bacterial suspensions, McFarland standards, antibiotic dilution	Dr. Milad Shahini
9	[2025/05/04]	Disk diffusion method: plate preparation, bacterial inoculation, antibiotic discs	Dr. Milad Shahini
10	[2025/05/06]	Measuring inhibition zones, interpreting antibiogram: double edges, inner colonies	Dr. Milad Shahini
11	[2025/05/11]	Antibiotic selection guidelines, inoculum preparation, dilution standards	Dr. Milad Shahini
12	[2025/05/13]	Broth microdilution for MIC: setup, incubation, panel reading and interpretation	Dr. Milad Shahini
13	[2025/05/18]	Macrobroth dilution for MIC and MBC: objectives and implementation	Dr. Milad Shahini

14	[2025/05/20]	Agar dilution, automated systems (Vitek, MicroScan)	Dr. Milad Shahini
15	[2025/05/25]	E-test for MIC and resistance interpretation	Dr. Milad Shahini
16	[2025/05/27]	Review session and final Q&A	Dr. Milad Shahini

Midterm Exam Date: [To be determined]

Final Exam Date: [To be determined]