

Course Plan

Number of students: 8

Semester: First

Year: 2025

Department: Medical Bacteriology

Major: Master's Degree in Medical Microbiology

Credit: 2

Course Title: Microbial Genetics

Course Type: Theoretical

Day & Time: Sunday, 13:30–15:00

Prerequisite: Molecular Biology

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:

This course aims to provide foundational and advanced knowledge of microbial genetics, focusing on bacteria. Students will learn the molecular basis of genetic processes including DNA replication, gene transcription and translation, gene regulation, genetic recombination, and horizontal gene transfer.

Learning Outcomes:

- Understand bacterial cell division mechanisms.
- Describe the concept and significance of DNA supercoiling.
- Explain different mechanisms of gene transfer in bacteria.
- Understand the transcription and translation processes in bacteria.
- Interpret the molecular basis of genetic regulation and expression.

References (Textbooks):

- "Molecular Genetics of Bacteria," 5th Edition, by Larry Snyder and Wendy Champness.
- "Microbiology," by Prescott, Harley and Klein.
- Supplementary articles and materials provided during the course.

Student Evaluation and Weight:

- Assignments: 2 marks
- Quiz: 2 marks
- Class Participation: 1 mark
- Midterm Exam: 7 marks
- Final Exam: 8 marks
- Total Marks: 20

Students Responsibilities:

- Active participation and punctuality in class sessions.
- Mobile phones must be turned off during class and exams.
- Attendance is mandatory. Absences without valid reason will affect final grades.

Discipline and Educational Rules:

Regulations are in accordance with the official rules of the Ministry of Health and Medical Education.

Course Schedule:

Week	Date	Time	Topic	Professor
1	[2025/05/06]	13:30–15:00	Bacterial Cell Division: Binary fission, septum formation, Z-ring	Dr. Milad Shahini
2	[2025/05/13]	13:30–15:00	Bacterial Cell Division (continued): Regulation, inhibitors, checkpoints	Dr. Milad Shahini
3	[2025/05/20]	13:30–15:00	DNA Supercoiling: Types, topoisomerases, significance	Dr. Milad Shahini
4	[2025/05/27]	13:30–15:00	Gene Transfer I: Transformation and Transduction	Dr. Milad Shahini

5	[2025/05/04]	13:30–15:00	Gene Transfer II: Conjugation, Plasmids, Transposons	Dr. Milad Shahini
6	[2025/05/11]	13:30–15:00	Gene Transcription: Promoters, sigma factors, RNA polymerase	Dr. Milad Shahini
7	[2025/05/18]	13:30–15:00	Gene Translation: Ribosome structure, tRNA, codons, initiation, elongation	Dr. Milad Shahini
8	[2025/05/25]	13:30–15:00	Review & Final Q&A Session	Dr. Milad Shahini

Midterm Exam Date: [To be determined]

Final Exam Date: [To be determined]