

**INTER AMERICAN UNIVERSITY OF PUERTO RICO  
METROPOLITAN CAMPUS  
SCHOOL OF SCIENCE AND TECHNOLOGY  
NATURAL SCIENCE DEPARTMENT  
MASTER'S IN SCIENCE IN MOLECULAR MICROBIOLOGY**

**SYLLABUS**

**I. GENERAL INFORMATION**

Course Title	:	Microbial Genomics
Code and number	:	MOMI 5110
Credits	:	2
Academic term	:	
Instructor	:	
Office hours and location	:	
Office telephone	:	
E-mail	:	

**II. DESCRIPCIÓN**

Analysis of the mechanisms of exchange of genetic material between bacteria and the control of gene expression. Emphasis on the use of plasmids, transposition elements and bacteriophages as genetic tools.

**III. OBJECTIVES**

At the end of the course, the student will be able to:

1. Know the techniques of common and specialized use that allow the detection of some important molecules for microorganisms (nucleic acids and proteins), as well as the application of these techniques in the diagnosis of diseases.
2. Describe the basic principles of microbial genetics and its applications in medical, pharmaceutical and industrial research.
3. Recognize microorganisms as useful tools in the area of biotechnology, to improve the quality of life of the population.
4. Explain the molecular mechanisms used by bacteria to regulate their genetic expression.

**Competences of the graduate's profile that are addressed in this course:**

1. Recognize the importance of Microbiology in the genomic era, in aspects related to human health and the balance of ecosystems.

2. Evaluate scientific information from diverse sources.

#### IV. CONTENT

Chapter 1: The Bacterial Chromosome: DNA Structure, Replication, and Segregation.

Chapter 2: Bacterial Gene Expression: Transcription, Translation, and Protein Folding.

Chapter 3: Bacterial Genetics Analysis

Chapter 4: Plasmids

Chapter 5: Conjugation

Chapter 6: Transformation

Chapter 7: Transposition, Site-Specific Recombination, and Families of Recombinases

Chapter 8: Molecular Mechanisms of Homologous Recombination

Chapter 9: DNA Repair and Mutagenesis

Chapter 10: Regulation of Gene Expression Operons

\* Scientific manuscripts and chapters of other books will be assigned.

#### V. LEARNING ACTIVITIES

- A. Conferences
- B. Student presentations
- C. Readings of scientific papers
- D. Discussion of readings

#### VI. EVALUATION

Course evaluation consists of:

Criteria	Score	% of Final Grade
Oral presentation	100	50
Written report	100	25
Participation and assignments	200	25
<b>Total</b>	<b>400</b>	<b>100</b>

#### VII. SPECIAL NOTES

- A. **Auxiliary services or special needs**

All students who require auxiliary services or special assistance must request these at the beginning of the course or as soon as they know that they need them, through the proper registry, in the Office of Orientation with Sr. José Rodríguez.

**B. Honesty, fraud, and plagiarism**

Dishonesty, fraud, plagiarism and any other inappropriate behavior in relation to academic work constitutes major infractions sanctioned by the General Student Regulations. The major infractions, as stated in the General Student Regulations, may have as a consequence, suspension from the University for a definite period greater than one year or the permanent expulsion from the University, among others sanctions.

**C. Use of electronic devices**

Cellular telephones and any other electronic device that could interrupt the teaching and learning processes or alter the environment leading to academic excellence will be deactivated. Any urgent situation will be dealt with, as appropriate. The handling of electronic devices that allow students to access, store or send data during evaluations or examinations is prohibited.

**D. Compliance with the Provisions of Title IX**

The Federal Higher Education Act, as amended, prohibits discrimination because of sex in any academic, educational, extracurricular, and athletic activity or in any other program or function, sponsored or controlled by a higher education institution, whether or not it is conducted within or outside the property of the institution, if the institution receives federal funds.

In harmony with the current federal regulation, in our academic unit an Assistant Coordinator of Title IX has been designated to offer assistance and orientation in relation to any alleged incident constituting discrimination because of sex or gender, sexual harassment or sexual aggression. The Assistant Coordinator, Sr. George Rivera, can be reached by phone at 787-250-1912, extension 2262 or 2147, or by e-mail [griverar@metro.inter.edu](mailto:griverar@metro.inter.edu).

The Normative Document titled **Norms and Procedures to Deal with Alleged Violations of the Provisions of Title IX** is the document that contains the institutional rules to direct any complaint that appears to be this type of allegation. This document is available in the Web site of Inter American University of Puerto Rico ([www.inter.edu](http://www.inter.edu)).

## **VIII. EDUCATIONAL RESOURCES**

### **Textbooks**

Molecular Genetics of Bacteria. Third Edition. Larry Snyder and Wendy Champness.

**Rev: Jan 2022**

