

**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	:	Omics Approaches in Microbiology
Code and number	:	MOMI 6300
Credits	:	2
Academic term	:	
Instructor	:	
Office hours and location	:	
Office telephone	:	
E-mail	:	

II. DESCRIPTION

Analysis of omics disciplines in the field of microbiology. Emphasis on biotechnological applications, the use of bioinformatics and the application of automated techniques for the analysis and interpretation of a large volume of data and its contribution to the study of cellular function and microbial systems.

III. OBJECTIVES

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

1. recognize the importance of omics approaches to the study of Microbiology at the molecular level, in aspects related to human health and ecosystem balance.
2. Evaluate scientific information from studies with omics applications applied to microbiology.
3. Evaluate the most useful platforms to analyze data from omics approaches using emerging tools.
4. Assess the importance of ethical standards related to scientific conduct in omics research and the defense of intellectual property.

Competencies of the graduate's profile addressed in the course

Demonstrate knowledge in:

Establishing the importance of Microbiology in the genomic era, in aspects related to human health and ecosystem balance.

Possess skills to:

Evaluate the most useful platforms for analyzing molecular microbiology data using emerging tools.

Argue ideas and research results before the scientific community, orally and in writing, in Spanish and English.

Demonstrate an attitude to:

Propose solutions based on molecular microbiology to address situations of predation and despoilment of ecological environments.

IV. CONTENT

- A. Fundamentals of Genomics
- B. Genomic applications to microbiology
- C. Fundamentals of gene regulation and transcriptomics
- D. Fundamentals of Proteomics
- E. Applications of transcriptomics and proteomics in microbiology
- F. Metabolomics
- G. Epigenomics in microbiology
- H. Metagenomics
- I. Metabolomics and Lipidomics
- J. Nutrigenomics
- K. Pharmacogenomics

V. ACTIVITIES

- 1. Conferences
- 2. Student participation/presentations/scientific manuscript analysis.
- 3. Practice exercises
- 4. Assigned readings

VI. EVALUATION

The evaluation of the course will be based on:

	Score	% of Final Grade
Written projects	200	50
Oral presentations	100	25
Quizzes	100	25
Total	400	100

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 o 2147, or by e-mail 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).

VIII. EDUCATIONAL RESOURCES

Textbook

There will not be an assigned textbook for this course, but a selection of essay readings.

IX. BIBLIOGRAPHY

Books:

OMICS: Applications in Biomedical, Agricultural, and Environmental Sciences. Debmalya Barh, Vasudeo Zambare and Vasco Azevedo 2013. CRC Press, ISBN 9781466562813

Articles

Articles will be assigned in class.

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