

# BIOS 2024 MICROBIOLOGY 2

**Credit Points** 10

**Legacy Code** 300896

**Coordinator** Oliver Morton ([https://directory.westernsydney.edu.au/search/name/Oliver Morton/](https://directory.westernsydney.edu.au/search/name/Oliver%20Morton/))

**Description** The unit focuses on the origins of genetic variation and the process of gene regulation in prokaryotes and explores the metabolic diversity of microorganisms from a variety of habitats and their application in industry and biotechnology. Using published scientific literature, students will learn how scientists research functional microbial physiology in the postgenomic era. The principles and applications of recombinant DNA techniques are discussed. Laboratory classes introduce students to techniques used to study microbial physiology and biotechnology based on microbial metabolism, such as examining the activity of antimicrobials and biotechnology such as microbial fuel cells.

**School** Science

**Discipline** Microbiology

**Student Contribution Band** HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 2 subject

**Pre-requisite(s)** BIOS 2022

**Equivalent Subjects** BIOS 2025 - Microbiology 2

**Assumed Knowledge**

Knowledge of the major groups of microorganisms and their structure and functions including DNA and key metabolic pathways.

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Discuss and compare examples of the metabolic strategies used by prokaryotes to survive in a wide range of environments and their application in industry
2. Explain the origins of genetic diversity in bacteria and how genes are regulated
3. Describe how recombinant DNA technology is used as a tool to address a range of biological questions
4. Describe and apply biochemical and molecular techniques used in the identification of an unknown microorganism and analyse the results
5. Perform basic techniques employed in the study of microbial physiology and genetics both individually and as a team
6. Analyse and interpret scientific literature and effectively communicate ideas

## Subject Content

1. Microbial genomics reveals potential metabolic pathways used by an organism

Prokaryotes use diverse metabolic strategies to obtain energy (aerobic and anaerobic respiration, photosynthesis, and fermentation) and use these in biosynthesis. Metabolism can also be harnessed for biotechnology to make microbial fuel cells, biofuels, industrial chemicals, and foods.

3. Prokaryotes regulate gene expression in response to external and internal cues and/or signals

Microorganisms can be classified and identified using biochemical, immunological, and genetic tests. These methods can also be used to examine mechanisms of microbial evolution.

5. Recombinant DNA technology is used as a tool to address a range of biological questions

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/Group Task
Assessment 1 Quizzes	30 minutes each	10	N	Individual
Assessment 2 Bacterial Identification using 16S Sequences	1 Page	5	N	Individual
Assessment 3 Presentation	Up to 10 minutes	15	N	Individual
Assessment 4 Laboratory Report	1,000 words	35	N	Individual
Assessment 5 Practical Exam	90 minutes	10	N	Individual
Assessment 6 Final Exam	Two Hours	25	N	Individual

Prescribed Texts

- Willey, J.M., Sandman, K. and Wood, D. (2020). Prescott's Microbiology, 11th edn, New York: Mc-GrawHill

Teaching Periods

## Spring

**Parramatta - Victoria Rd**

**Day**

**Subject Contact** Oliver Morton ([https://directory.westernsydney.edu.au/search/name/Oliver Morton/](https://directory.westernsydney.edu.au/search/name/Oliver%20Morton/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=BIOS2024\\_22-SPR\\_PS\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS2024_22-SPR_PS_D#subjects))