



# MBIO19012 Microbiology

## Term 1 - 2024

Profile information current as at 10/05/2024 08:30 pm

All details in this unit profile for MBIO19012 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

### General Information

#### Overview

On successful completion of this unit, you will have a sound understanding of the fundamentals of microbiology. You will be able to explain the principles by which microbes are classified, the relationship between form and function, the mechanisms by which genetic change occurs and the dynamics of growth and multiplication. Mixed mode and Rockhampton students must attend a compulsory residential school or on-campus laboratory classes in order to achieve the learning outcomes.

#### Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

#### Pre-requisites or Co-requisites

Corequisite: BIOL11099 Living Systems or BIOL 11100 Functional Biology or SCIE11022 Introductory Science or BIOH11005 Introductory Anatomy and Physiology or BMSC11001 Human Body Systems 1 or BIOL11102 Life Science Laboratory or BMSC11007 Medical Anatomy and Physiology 1 or BMSC11010 Human Anatomy and Physiology 1.

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

#### Offerings For Term 1 - 2024

- Bundaberg
- Mixed Mode
- Rockhampton

#### Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

#### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

#### Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

## Class and Assessment Overview

### Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

### Class Timetable

#### [Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

#### [Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

### Assessment Overview

#### 1. **Written Assessment**

Weighting: 25%

#### 2. **Practical and Written Assessment**

Weighting: 25%

#### 3. **Online Test**

Weighting: 50%

### Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

## CQUniversity Policies

**All University policies are available on the [CQUniversity Policy site](#).**

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from Student evaluation data

**Feedback**

Students would prefer the tutorials be after all of the weekly lectures.

**Recommendation**

Tutorials will be scheduled after all lectures.

#### Feedback from Student evaluation data

**Feedback**

Students found the residential schools extremely valuable.

**Recommendation**

Residential schools will continue in their current format.

#### Feedback from Student evaluation data

**Feedback**

Some students would like recorded videos on assessment requirements.

**Recommendation**

Videos on assessment requirements will be looked into, as they could be valuable for students unable to attend the zoom drop in sessions.

## Unit Learning Outcomes

**On successful completion of this unit, you will be able to:**

1. Explain the principles by which microbes are classified, using traditional and molecular approaches
2. Describe the relationship between form and function in the major groups of microbes
3. Describe the mechanisms by which genetic exchange occurs in bacteria, fungi and viruses
4. Explain the dynamics of growth and multiplication of the major types of microbes, and the methods by which these can be investigated in the laboratory
5. Demonstrate basic practical microbiological procedures in the laboratory in a safe and efficient manner
6. Interpret the results of laboratory experiments in the context of the underlying microbiological principles.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 25%	•	•				
2 - Practical and Written Assessment - 25%					•	•
3 - Online Test - 50%	•	•	•	•		

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication	•	•	•	•	•	•
2 - Problem Solving						•
3 - Critical Thinking		•			•	•
4 - Information Literacy		•				
5 - Team Work						
6 - Information Technology Competence	•	•	•	•	•	
7 - Cross Cultural Competence						
8 - Ethical practice					•	
9 - Social Innovation						
10 - Aboriginal and Torres Strait Islander Cultures						

## Textbooks and Resources

### Textbooks

MBIO19012

#### Prescribed

##### **Microbiology: an introduction**

Edition: 13th (2020)

Authors: Tortora, Funke, Case

Pearson

Upper Saddle River , New Jersey , USA

ISBN: 9781292276267

Binding: Paperback

#### **Additional Textbook Information**

An eBook version can also be purchased from the publisher. Also, Mastering Microbiology can be purchased separately or in a bundle with the textbook. Mastering provides additional animations, tutorials and quizzes, and is useful for those who would like more support with their study. More information on this, including links, will be available on the Moodle site.

Paper copies, including a bundle which includes the eBook can be purchased at the CQUni Bookshop here:

<http://bookshop.cqu.edu.au> (search on the Unit code).

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

**You will need access to the following IT resources:**

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

## Referencing Style

**All submissions for this unit must use the referencing styles below:**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Sandrine Makiela** Unit Coordinator

[s.makiela@cqu.edu.au](mailto:s.makiela@cqu.edu.au)

## Schedule

### **Week 1 - 04 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Introduction, laboratory safety, laboratory techniques.	Tortora, chapters 1 & 3.	

### **Week 2 - 11 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Prokaryote structure and function.	Tortora, chapters 4, 10, 11.	

**Week 3 - 18 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Eukaryote structure and function.	Tortora, chapters 4, 10, 12.	

**Week 4 - 25 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Viruses.	Tortora, chapter 13.	

**Week 5 - 01 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Microbial metabolism and culture.	Tortora, chapters 2 & 6.	Online test 1 - opens 9am AEST 5th April (Friday), closes in 24h.

**Vacation Week - 08 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
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**Week 6 - 15 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Microbial growth and control of growth.	Tortora, chapters 6 & 7.	

**Week 7 - 22 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Microbial ID and genetics.	Tortora, chapters 8 & 10.	Residential school Rockhampton (1): 26-28th April.

**Week 8 - 29 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Human and microbial ecology.	Tortora, chapter 14.	

**Week 9 - 06 May 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Module A <b>or</b> Module B <b>or</b> Module C. (see Term Specific Information)	Specific readings for each module will be provided on the Moodle site.	Online test 2 - opens 9am AEST 10th May (Friday), closes in 24h.  <b>Microorganism Design</b> Due: Week 9 Monday (6 May 2024) 11:59 pm AEST

**Week 10 - 13 May 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Module A <b>or</b> Module B <b>or</b> Module C. (see Term Specific Information)	Specific readings for each module will be provided on the Moodle site.	Residential school Bundaberg: 15-17th May.

**Week 11 - 20 May 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Module A <b>or</b> Module B <b>or</b> Module C. (see Term Specific Information)	Specific readings for each module will be provided on the Moodle site.	Residential school Rockhampton (2): 24-26th May.

**Week 12 - 27 May 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Module A <b>or</b> Module B <b>or</b> Module C. (see Term Specific Information)	Specific readings for each module will be provided on the Moodle site.	

**Review/Exam Week - 03 Jun 2024**

Module/Topic	Chapter	Events and Submissions/Topic
		Online test 3 - opens 9am AEST 3rd June (Monday), closes in 48h.

## Term Specific Information

You will notice in the Schedule that there are different module choices in weeks 9-12. Each module has different topics; this is done to make the unit more relevant to your discipline area. Later in the term, you will need to choose which module you want to do using a choice activity on the Moodle site.

## Assessment Tasks

### 1 Microorganism Design

#### Assessment Type

Written Assessment

#### Task Description

Keeping in mind your chosen field of study, you are required to design a microorganism which is best suited to a particular environment. You **must** choose one of the following:

1. An opportunistic human pathogen of the nervous system, which causes inflammation and headaches.
2. A blood-borne human pathogen, which is transmitted by mosquitoes and causes skin rashes and sweating.
3. A commensal microbe of the small intestine, which assists fat metabolism and promotes resistance to pathogenic enterobacteria.
4. A water-borne human pathogen, which causes intestinal bleeding and gout-like symptoms.

**Please note** that you are designing a hypothetical organism. Your microbe cannot be identical to an existing microbe. In your paper, you will be required to:

- Name your microorganism, both genus and species.
- Decide on the type of organism (bacterium, fungus, or protozoan).
- Select the features of your microorganism based on your knowledge of microbial form and function, physiology and ecology. These features should enable your microorganism to survive and be successful in its environment (in the case of a disease, you may also choose additional symptoms).
- Rationalise your choices based on relevant literature.

Suggested length: 2000 words.

More detailed instructions will be provided on the Moodle page.

#### A note on the use of AI:

Students are permitted to use Generative AI for this assessment in the following ways:

- developing literature search strategies
- compiling suitable literature sources and locating data
- guidance for structuring the assignment

If Generative AI is used in any way, it must be cited as per the CQU Guidelines (Academic Learning Centre). If students choose to use generative AI, the following statement must be completed and included on the front page of the uploaded assessment: "I have used (insert technology) to (insert how you used this) in accordance with the requirements of this unit. The reason I used this was to (explain why you used it). The details of how I used it as (insert how). I hereby declare that the submission is an appropriate representation of my individual skills and abilities to meet the requirements of the task/s."

As per academic writing requirements and assessment criteria; citations of information should be of the primary source (i.e. statistics returned by AI must be fact-checked and referenced from their original source as well as the AI source). Failure to cite primary sources as well as AI sources could be considered breach of academic integrity. Your use of Generative AI must be clearly outlined in an appendix as a separate file which includes the prompt used and Generative AI response. Failure to include an appendix may result in academic integrity investigation.

#### Assessment Due Date

Week 9 Monday (6 May 2024) 11:59 pm AEST

#### Return Date to Students

Week 11 Monday (20 May 2024)

**Weighting**

25%

**Minimum mark or grade**

50%

**Assessment Criteria**

The complete assessment rubrics will be available on the Moodle site, and will be on the following criteria:

- Knowledge of theory (30%)
- Selected features and rationalisation (40%)
- Presentation (10%)
- Clarity of expression (10%)
- Referencing (10%)

**Referencing Style**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

**Submission**

Online

**Learning Outcomes Assessed**

- Explain the principles by which microbes are classified, using traditional and molecular approaches
- Describe the relationship between form and function in the major groups of microbes

## 2 Practical Competencies

**Assessment Type**

Practical and Written Assessment

**Task Description**

This assessment is in 3 parts:

Part 1 - pre-lab quizzes. You are required to do online quizzes based on the laboratory manual and provided instructional videos before coming to the laboratory. There are 5 quizzes in total, and all will be open from the start of term. You will do them all before coming to residential school. Each quiz will consist of 5 questions and will be timed (15 min). You can have 2 attempts at each quiz.

Part 2 - practical competencies. You will be marked on 7 practical skills during residential school. These skills are: aseptic technique, pipetting, the four streak dilution method, microscope use, Gram staining, fungal slide preparation, and microbial identification. The marking will occur during the normal course of the residential school (it is not under exam conditions). Detailed descriptions and requirements for this task will be available on the Moodle site.

Part 3 - post-lab quiz. You are required to do an online quiz (short-answer questions) based on the results of the practical sessions. The quiz will open on the last day of your residential school. It consists of 5 questions and will be timed (45 min), and you have one attempt only.

**Assessment Due Date**

Part 1 - 8:00am AEST the first day of your residential school. Part 3 - 11:55pm AEST 2 weeks after the last day of your residential school.

**Return Date to Students**

Part 1 - within half an hour. Part 3 - two weeks after the due date.

**Weighting**

25%

**Minimum mark or grade**

50%

**Assessment Criteria**

Part 1 is worth 5%, and will be marked as the total of all five quizzes (your highest mark of each).

Part 2 is worth 10%, and will be marked on how well you perform each competency and the result (final product). A detailed marks sheet will be available on the Moodle site.

Part 3 is worth 10%, and will be your quiz mark.

**Referencing Style**

- [Harvard \(author-date\)](#)



- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

#### **Submission**

No submission method provided.

#### **Submission Instructions**

Online quizzes and in the laboratory.

#### **Learning Outcomes Assessed**

- Demonstrate basic practical microbiological procedures in the laboratory in a safe and efficient manner
- Interpret the results of laboratory experiments in the context of the underlying microbiological principles.

## **3 Online Tests**

#### **Assessment Type**

Online Test

#### **Task Description**

An understanding of fundamental microbiological concepts is essential in many science based professions. Your knowledge of the content and concepts will be examined by three online tests held at intervals throughout the term. The first online test will be in week 5, and will cover the content of weeks 1-4. The second will be in week 9, and cover the content of weeks 5-8. The third will be during the examination period, and will cover the content of weeks 9-12. These online tests will be done as quizzes in Moodle, and will be a mixture of multiple choice and short answer questions. Each test will be open for 24h and will be timed. Details are as follows:

Online test 1 - Friday week 5 (5th April), opens at 9am AEST and closes in 24h.

Online test 2 - Friday week 9 (10th May), opens at 9am AEST and closes in 24h.

Online test 3 - Monday 3rd June, opens at 9am AEST and closes in 48h.

Further details will be available on the Moodle site.

#### **Assessment Due Date**

Test 1 in week 5 on Friday, Test 2 in week 9 on Friday, Test 3 in the review period on Monday.

#### **Return Date to Students**

Marks for each online test will be finalised within 10 working days of the test date.

#### **Weighting**

50%

#### **Minimum mark or grade**

50%

#### **Assessment Criteria**

Marks will be awarded on correctness and completeness. Multiple choice questions in each online test will be marked automatically by Moodle. Short answer questions will be marked manually. Your total mark for this assessment will be the sum of all three online test marks.

#### **Referencing Style**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

#### **Submission**

No submission method provided.

#### **Submission Instructions**

Online quizzes.

#### **Learning Outcomes Assessed**

- Explain the principles by which microbes are classified, using traditional and molecular approaches
- Describe the relationship between form and function in the major groups of microbes
- Describe the mechanisms by which genetic exchange occurs in bacteria, fungi and viruses
- Explain the dynamics of growth and multiplication of the major types of microbes, and the methods by which these can be investigated in the laboratory

## Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

### What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

### Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

### Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

### What can you do to act with integrity?



#### Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



#### Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



#### Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem