MBIO19013 *Applications of Microbiology*
Term 2 - 2019

Profile information current as at 26/04/2024 07:51 pm

General Information

Overview
On successful completion of this unit, students will have a sound understanding of selected applications of microbiology. Students should be able to explain the fundamental principles of environmental microbiology with particular reference to air, food, water and wastewater, the role of microbes in relation to human health and epidemiology and the influences of microbes of human society. Students must attend a compulsory residential school or on-campus lab classes in order to achieve the leaning 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
MBIO19012 Microbiology or MBIO19003 Introductory Microbiology
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 2 - 2019

- 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. **Presentation and Written Assessment**
Weighting: 20%
2. **Practical and Written Assessment**
Weighting: 30%
3. **Examination**
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, student discussions, self-reflection.

Feedback

Students were happy with the unit overall.

Recommendation

There will be no changes to the unit at this point, particularly since this unit will be under revision for the restructure of the science degree.

Unit Learning Outcomes

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

1. Explain the fundamental principles of environmental microbiology, with particular reference to air, food, water and wastewater.
2. Discuss the role of microbes in relation to human health, with particular reference to the normal microbiota and exogenous microbes.
3. Analyse the influences of microbes on human society and its activities.
4. Apply the fundamental principles of microbial epidemiology to current issues relating to human/animal/plant health.
5. Work with others to carry out relevant 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/applications.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level | ◦ Introductory Level | • Intermediate Level | • Graduate Level | ◦ Professional Level | ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Presentation and Written Assessment - 20%			•	•		
2 - Practical and Written Assessment - 30%					•	•
3 - Examination - 50%	•	•	•	•		

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6

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						

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Presentation and Written Assessment - 20%	●		●	●		●				
2 - Practical and Written Assessment - 30%	●	●	●	●	●	●	●	●		
3 - Examination - 50%	●	●								

Textbooks and Resources

Textbooks

MBIO19013

Prescribed

Environmental Microbiology
Edition: 3rd (2014)
Authors: Pepper, Gerba and Gentry
Elsevier
Burlington , MA , USA
ISBN: 978-0-12-394626-3
Binding: Hardcover

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Web cam and microphone

Referencing Style

All submissions for this unit must use the referencing style: Harvard (author-date)
For further information, see the Assessment Tasks.

Teaching Contacts

Sandrine Makiela Unit Coordinator
s.makiela@cqu.edu.au

Schedule

Week 1 - 15 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Introduction, human disease	1, 22, 30, 31	

Week 2 - 22 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Animal and plant disease, biocontrol	20	

Week 3 - 29 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Microorganisms in nature	4, 5, 6, 7	

Week 4 - 05 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Microbial interactions with the environment	15, 16, 19, 31	Experimental design for Project Report due Friday (9th August) 5:00pm AEST.

Week 5 - 12 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic

Food microbiology	22	

Vacation Week - 19 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 26 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Waste water treatment	23, 25, 26, 27, 28, 29	

Week 7 - 02 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Practical block session (5 - 8 September)		**Essay and Seminar on Controversial Issue** Due: Week 7 Monday (2 Sept 2019) 9:00 am AEST

Week 8 - 09 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Sampling, processing and culture of microbes	8, 10	

Week 9 - 16 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Detection, enumeration and bioinformatics	11, 12, 13, 21	

Week 10 - 23 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Bioremediation, biodegradation and bioleaching	17, 18, 31	**Project Report and Peer Assessment** Due: Week 10 Monday (23 Sept 2019) 9:00 am AEST

Week 11 - 30 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Industrial microbiology and biofuels	20	

Week 12 - 07 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
Revision		

Review/Exam Week - 14 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 21 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Essay and Seminar on Controversial Issue

Assessment Type
Presentation and Written Assessment

Task Description
You will be assessed on two tasks (for a total weighting of 20%):
15% - essay
5% - seminar

Essay
On the unit Moodle site, you will have a choice of 5 topics, each of which is a controversial issue in microbiology. Please note that the number of students in each topic will be restricted. You will need to write a critical debate on their chosen

topic. There is no right or wrong answer, but you will need to critically review all sides of the issue and defend your opinion with references.
Word length: 1000-1400 words.
Seminar
You will need to prepare a short (3-6 minute) seminar presenting one aspect of your essay; there will be several choices available per essay topic on the unit Moodle site. All seminars will be delivered via Zoom at a time and date negotiated between students and the unit coordinator (it will be after Week 10). The use of a PowerPoint presentation is optional.

Assessment Due Date
Week 7 Monday (2 Sept 2019) 9:00 am AEST

Return Date to Students
Week 9 Monday (16 Sept 2019)

Weighting
20%

Minimum mark or grade
40%

Assessment Criteria
For the essay, a full assessment rubrics will be available on the unit Moodle site, using the following criteria:

- Content and range of knowledge (20%)
- Application of critical analysis (40%)
- Defense of argument (10%)
- Presentation (10%)
- Clarity of expression (10%)
- Referencing (10%)

For the seminar, detailed marking criteria will be available on the unit Moodle site, and will be based on the following:

- Seminar content (60%)
- Seminar presentation (40%)

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- Analyse the influences of microbes on human society and its activities.
- Apply the fundamental principles of microbial epidemiology to current issues relating to human/animal/plant health.

Graduate Attributes

- Communication
- Critical Thinking
- Information Literacy
- Information Technology Competence

2 Project Report and Peer Assessment

Assessment Type
Practical and Written Assessment

Task Description
In small groups (3 - 4 people), you will be asked to collaboratively design an experiment, carry out the experiment during the practical block session, and then individually prepare a scientific report on the project.
You will be given a choice of two or three potential project areas; these will be available on the Moodle site **one week prior to the start of term**. Based on each student's preference of project area, you will be assigned to a group by the unit coordinator early in Week 1. The allocation of roles within these groups will be determined collectively by the group members. Each group will have their own discussion forum and Zoom session in Moodle.
You will be assessed on various tasks (for a total weighting of 30%):
5% - experimental design (group assessed)
15% - written report (individually assessed)

10% - peer assessment (individually assessed)

Experimental Design

You will be provided with a list of available materials early in Week 1. In your groups, you must research and design a scientifically valid experiment. Students who have not studied experimental design are advised to read the basic concepts provided in Moodle.

The experimental design must be submitted by the end of **Week 4** (**9th August**), and should include a list of materials required to ensure that the material will be available by the practical session. The experimental designs will be marked and returned before the practical session in case any changes need to be made.

You will only be allocated a certain amount of time to undertake their experiment during the practical block session. Part of the experimental design should include time requirements.

Written Report

The written report will be an article for a journal submission. As such, you will need to follow the "Guidelines for Authors" document for the journal when preparing your submission. This document, the conventions to follow and the passing standards will be available on Moodle, and will be clearly outlined in the practical session.

Word limit: 1500 words max.

Peer Assessment

You will be asked to grade yourself and each of your team members on how well they performed as a team member. This will be done in a formative manner after the experimental design stage and will be repeated summatively after the practical block session. Each student's final mark will be an average of the summative peer assessments. These will be done via the Self and Peer Assessment program, which will be available in Moodle.

Assessment Due Date

Week 10 Monday (23 Sept 2019) 9:00 am AEST

This is both the final report and the summative peer assessment.

Return Date to Students

Week 12 Monday (7 Oct 2019)

Weighting

30%

Minimum mark or grade

40%

Assessment Criteria

The experimental design will be marked per group. Detailed marking criteria will be available on the unit Moodle site, and will be based on the following:

- Clarity of objectives and focus of the work (25%)
- Validity of experimental design (50%)
- Use of literature (25%)

For the report, a full assessment rubrics will be available on the unit Moodle site, using the following criteria:

- Scientific writing (10%)
- Data presentation and analysis (20%)
- The extent to which the results are considered and discussed (40%)
- Report presentation (10%)
- Clarity of expression (10%)
- Referencing (10%)

The peer assessment questionnaire will be available on the unit Moodle site from Week 4. The criteria will be discussed on the forums and during the practical block.

Referencing Style

- Harvard (author-date)

Submission

Online

Learning Outcomes Assessed

- Work with others to carry out relevant 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/applications.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

Examination

Outline
Complete an invigilated examination.

Date
During the examination period at a CQUniversity examination centre.

Weighting
50%

Length
180 minutes

Minimum mark or grade
50%

Exam Conditions
Closed Book.

Materials
Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

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