



# BMOL3401

## Applied and Medical Microbiology

Session 1, In person-scheduled-weekday, North Ryde 2023

*School of Natural Sciences*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convener

Sasha Tetu

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14ER room 201

Mon-Thur

Credit points

10

Prerequisites

130cp at 1000 level or above including BMOL2401 or CBMS215 or CBMS202

Corequisites

Co-badged status

Unit description

Applied and Medical Microbiology examines the microbial world and how it interacts with our own. A key focus will be the role of microorganisms in human health and disease, covering topics ranging from the role of the human microbiome and the body's natural defences in protecting against microbial disease to epidemiology and the pathogenesis of infectious microorganisms. This unit covers medically important bacteria, fungi and viruses as well as antimicrobial agents, microbial resistance and susceptibility testing. Topics in applied microbiology include biotechnology, synthetic biology, food and water microbiology. In the hands-on laboratory sessions students gain skills in the current tools and techniques used in medical and applied microbiology laboratories. This unit is especially valuable for students majoring in biomolecular sciences, biology, and medical sciences.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

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

**ULO1:** Explain principles of how microorganisms colonise different niches, and how they respond to their chemical, physiological and physical environment, in complex communities.

**ULO2:** Demonstrate key practical skills in working with microorganisms, including being able to apply and adapt methods to identify microorganisms and the use of good microbiological practices.

**ULO3:** Integrate ideas, discuss and communicate results effectively for verbal and written presentation including sourcing appropriate microbiology literature to support scientific data.

**ULO4:** Work cooperatively in a team through engagement, exercising initiative, and with accountability in order to maximise the achievement of goals.

**ULO5:** Acquire knowledge and understanding of how microbiology concepts apply to diverse areas such as medicine and health, industry, agriculture and biotechnology.

## General Assessment Information

### Requirements to Pass this Unit

To pass this unit you must:

- Achieve a total mark equal to or greater than 50%
- Participate in a minimum of 8 of the 10 weekly laboratory classes (unless Special Consideration has been granted for additional missed sessions)

### Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7<sup>th</sup> day (including weekends). After the 7<sup>th</sup> day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#).

**Late submissions will only be accepted for the 'Practical and tutorial work' (lab book) assessment task for this unit.**

**For all other tasks late submission will NOT be accepted unless Special Consideration is granted.**

### Special Consideration

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through [ask.mq.edu.au](http://ask.mq.edu.au).

*Weekly practice-based tasks:* To pass the unit you need to demonstrate ongoing development of skills and application of knowledge in 8 out of 10 of the weekly practical laboratory classes. If you miss a weekly practical laboratory class due to a serious, unavoidable and significant disruption, contact your convenor ASAP as you may be able to attend another class that week.

If it is not possible to attend another class, you should still contact your convenor for access to class material to review in your own time.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Practical preparation and lab skills</a>	0%	No	Weeks 1-12
<a href="#">Lecture content-based questions</a>	5%	No	Weeks 2-12
<a href="#">Mid Semester Test</a>	15%	No	Week 7
<a href="#">Microbe presentation</a>	10%	No	Week 8
<a href="#">Practical and tutorial work</a>	20%	No	Week 11
<a href="#">Final Examination</a>	50%	No	Examination period

### Practical preparation and lab skills

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Weeks 1-12**

Weighting: **0%**

You are expected to participate in at least 80% of the practical laboratory classes to pass this unit.

On successful completion you will be able to:

- Demonstrate key practical skills in working with microorganisms, including being able to apply and adapt methods to identify microorganisms and the use of good microbiological practices.

- Work cooperatively in a team through engagement, exercising initiative, and with accountability in order to maximise the achievement of goals.

## Lecture content-based questions

Assessment Type **1**: Quiz/Test

Indicative Time on Task **2**: 5 hours

Due: **Weeks 2-12**

Weighting: **5%**

Small tasks across the semester to reward lecture engagement

On successful completion you will be able to:

- Explain principles of how microorganisms colonise different niches, and how they respond to their chemical, physiological and physical environment, in complex communities.
- Acquire knowledge and understanding of how microbiology concepts apply to diverse areas such as medicine and health, industry, agriculture and biotechnology.

## Mid Semester Test

Assessment Type **1**: Quiz/Test

Indicative Time on Task **2**: 10 hours

Due: **Week 7**

Weighting: **15%**

Mid Semester Test

On successful completion you will be able to:

- Explain principles of how microorganisms colonise different niches, and how they respond to their chemical, physiological and physical environment, in complex communities.
- Acquire knowledge and understanding of how microbiology concepts apply to diverse areas such as medicine and health, industry, agriculture and biotechnology.

## Microbe presentation

Assessment Type **1**: Presentation

Indicative Time on Task <sup>2</sup>: 12 hours

Due: **Week 8**

Weighting: **10%**

Students will prepare and present a short report on a well studied microorganism.

On successful completion you will be able to:

- Explain principles of how microorganisms colonise different niches, and how they respond to their chemical, physiological and physical environment, in complex communities.
- Integrate ideas, discuss and communicate results effectively for verbal and written presentation including sourcing appropriate microbiology literature to support scientific data.
- Work cooperatively in a team through engagement, exercising initiative, and with accountability in order to maximise the achievement of goals.

## Practical and tutorial work

Assessment Type <sup>1</sup>: Lab book

Indicative Time on Task <sup>2</sup>: 16 hours

Due: **Week 11**

Weighting: **20%**

Pre-practical exercises, performance in the practicals, tutorials and post-practical exercises and laboratory record keeping will be used to calculate the final practical mark. The tasks are designed to encourage you to engage with practical material and develop useful workplace skills including: planning and time management, safe working practices and good record keeping.

On successful completion you will be able to:

- Demonstrate key practical skills in working with microorganisms, including being able to apply and adapt methods to identify microorganisms and the use of good microbiological practices.
- Integrate ideas, discuss and communicate results effectively for verbal and written presentation including sourcing appropriate microbiology literature to support scientific data.
- Work cooperatively in a team through engagement, exercising initiative, and with

accountability in order to maximise the achievement of goals.

## Final Examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **Examination period**

Weighting: **50%**

The final exam will require students to apply terminology and concepts learnt in the lecture and practical components to answer a variety of questions of a critical thinking nature.

On successful completion you will be able to:

- Explain principles of how microorganisms colonise different niches, and how they respond to their chemical, physiological and physical environment, in complex communities.
- Acquire knowledge and understanding of how microbiology concepts apply to diverse areas such as medicine and health, industry, agriculture and biotechnology.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

### Lectures

The expectation is that you will engage with lecture material and carry out the additional readings and/or viewing of associated material which is provided with certain lectures.

Attending lectures during the scheduled time is highly recommended. Lectures will include questions and discussion sessions and participation is highly encouraged.

Looking over lecture slides or recordings are NOT a suitable substitute to attending the lectures. Students tend to perform poorly if they do not engage with lectures throughout the term and this will also impact your ability to prepare for and understand material in practical and tutorial sessions.

## **Practicals and tutorials**

Both lab-based practical classes and online tutorials are designed to develop microbiology laboratory skills, safety practices and critical and analytical thought. Pre-practical exercises are designed to make sure you are ready for the practical work and have grasped the relevant theory and safety practices necessary.

In week 1 you are required to attend the scheduled online tutorial (which takes place at the same time you will attend practical classes in weeks 2-12) - there are NO lab based practicals in week 1. Please make sure you have your own lab coat and lab notebook prior to week 2.

## **Self-Study**

The unit expectation is that you will spend time outside formal instruction reviewing notes taken in class, reading assigned materials (textbook sections and other referenced papers or articles) and exploring other sources of information on applied and medical microbiology. To self-assess your degree of understanding and to practice problem solving skills you are expected to attempt problems from the lectures, textbook and other resources.

## **Required and Recommended Texts and Materials**

Practical Manual and Tutorial outlines – information outlining each tutorial and laboratory session will be available on iLearn for download one week prior to the session. Please download and complete any preparatory activities prior to your session.

You will be expected to bring a copy of practical manual notes, a lab coat, closed shoes and lab notebook to each practical.

Prescribed text: Brock Biology of Microorganisms Global Edition 15th or 16th edition. Madigan, Martenko, Stahl, Clark, Buckley. Publisher: Pearson education Inc, San Francisco. ISBN: 9781292235103

Interactive lectures, laboratory practical sessions and practical-focussed online tutorials are all integral components of the unit. A comprehensive understanding of material covered in each of these course components will greatly assist you in the final exam, which covers ALL components of the unit.

## **Additional Information**

We will communicate with you via your university email or through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to BMOL3401@mq.edu.au from your **university email** address.

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus->



faqs. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

### The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.