



BMOL3401

Applied and Medical Microbiology

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Natural Sciences

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General Information

Unit convenor and teaching staff

Sasha Tetu

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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

General Faculty Policy on assessment submission deadlines and late submissions:

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date. Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Assessments not submitted by the due date will receive a mark of zero **unless** late submissions are specifically allowed as indicated in the unit guide or on iLearn.

If late submissions are permitted as indicated in the unit guide or on iLearn a consistent penalty will be applied for late submissions as follows:

A 12-hour grace period will be given after which the following deductions will be applied to the awarded assessment mark: 12 to 24 hours late = 10% deduction; for each day thereafter, an additional 10% per day or part thereof will be applied until five days beyond the due date. After this time, a mark of zero (0) will be given. For example, an assessment worth 20% is due 5 pm on 1 January. Student A submits the assessment at 1 pm, 3 January. The assessment received a mark of 15/20. A 20% deduction is then applied to the mark of 15, resulting in the loss of three (3) marks. Student A is then awarded a final mark of 12/20.

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

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Practical attendance</u>	0%	Yes	Week 1-12
<u>Mid Semester Test</u>	15%	No	Week 7
<u>Practical and tutorial work</u>	20%	No	Week 12

Name	Weighting	Hurdle	Due
Microbe presentation	10%	No	Week 8
Lecture content-based questions	5%	No	Week 2-13
Final Examination	50%	No	Examination period

Practical attendance

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 0 hours

Due: **Week 1-12**

Weighting: **0%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

You are expected to attend and participate in at least 80% of the practical laboratory classes to pass this unit. This is a hurdle requirement.

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.

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.

Practical and tutorial work

Assessment Type ¹: Lab book

Indicative Time on Task ²: 16 hours

Due: **Week 12**

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.

Microbe presentation

Assessment Type ¹: Presentation

Indicative Time on Task ²: 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.

Lecture content-based questions

Assessment Type **1**: Participatory task

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

Due: **Week 2-13**

Weighting: **5%**

Small tasks across the semester to reward lecture participation

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.

Final Examination

Assessment Type **1**: Examination

Indicative Time on Task **2**: 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.

¹ 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.

² 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 live lectures 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.

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 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.

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 or if you are a Global MBA student contact 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 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/.

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.

Changes from Previous Offering

COVID Information and on-campus classes

On-campus teaching continues to be scheduled for Session 1, 2022. Masks are compulsory for all classes in indoor spaces and social distancing will be implemented wherever possible. Students will also be required to sanitise surfaces before and after use.

Students are requested to minimise the risk of spreading COVID to themselves and others in accordance with the university and NSW Health guidelines: <https://www.mq.edu.au/about/corona-virus-faqs> and <https://www.nsw.gov.au/covid-19/stay-safe>.

Any further requirements or changes to units in relation to COVID will be communicated to students via iLearn.

Off-shore students

Off-shore students **must** email the convenor as soon as possible to discuss study options.