BMOL3401

Applied and Medical Microbiology

Session 1, In person-scheduled-weekday, North Ryde 2025

School of Natural Sciences

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General Information

Unit convenor and teaching staff
Sasha Tetu
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14ER 201
monday-thursday

Credit points
10

Prerequisites
130cp at 1000 level or above including BMOL2401

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.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals (UNSDGs) Good Health and Well Being; Clean Water and Sanitation

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: Aquire 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%.

Please note that regular attendance and engagement with practical activities is highly recommended, since it will be difficult to pass the unit without obtaining marks from assessments based on these activities.

Attendance and participation

We strongly encourage all students to actively participate in all learning activities. Regular engagement is crucial for your success in this unit, as these activities provide opportunities to deepen your understanding of the material, collaborate with peers, and receive valuable feedback from instructors, to assist in completing the unit assessments.

Regular, weekly engagement in laboratory classes is particularly important, as many experiments run across a number of weeks and multiple missed classes can make it difficult to develop fundamental skills and obtain sensible results. Please be aware that due to the specific culturing requirements of the microorganisms used, it is generally not possible to offer make-up activities for sessions missed.

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 your independent research project or lab book assessment is not submitted, up until the 7th day (including weekends). After the 7th 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.

Assessments where Late Submissions will be accepted

- Independent Research Project – YES, Standard Late Penalty applies
- Lab book – YES, Standard Late Penalty applies
- Final exam - NO, 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 https://connect.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
Independent Research Project	15%	No	07/04/2025
Laboratory Book	35%	No	Week 11 practical class
Final Examination	50%	No	Exam Period

Independent Research Project

Assessment Type [1]: Project
Indicative Time on Task [2]: 13 hours
Due: **07/04/2025**
Weighting: **15%**

Your project will involve you carrying out independent research, allowing you to explore current techniques and practices relevant to medical microbiology and helping you connect your lab experiments with aspects of theory covered in the lectures. Additionally, this project will help you develop skills in locating and interpreting relevant scientific papers.

On successful completion you will be able to:

- Integrate ideas, discuss and communicate results effectively for verbal and written presentation including sourcing appropriate microbiology literature to support scientific data.
- Aquire knowledge and understanding of how microbiology concepts apply to diverse areas such as medicine and health, industry, agriculture and biotechnology.

Laboratory Book

Assessment Type [1]: Lab book
Indicative Time on Task [2]: 30 hours
Due: **Week 11 practical class**
Weighting: **35%**

Your laboratory book will be submitted and graded in Week 11 to assess your ability to plan and conduct experiments safely with microorganisms, perform common microbiology procedures while maintaining real-time records, interpret experimental findings, and evaluate the strengths and limitations of current techniques in medical microbiology research.

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 [1]: Examination
Indicative Time on Task [2]: 30 hours
Due: **Exam 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.
- Aquire knowledge and understanding of how microbiology concepts apply to diverse areas such as medicine and health, industry, agriculture and biotechnology.

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[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

Week 1 Classes

Lectures begin in week 1, please see iLearn site for times and room information. In week 1 you are also expected to attend the scheduled online workshop. A zoom link for this workshop will be made available on the iLearn site- please note the time (different from prac times) and make sure to attend this session in a location where you are able to participate in small-group discussions.

There are no lab-based practicals in week 1. Please make sure you have your own lab coat prior to week 2 when practical laboratory classes commence.

Methods of Communication

We will communicate with you via your university email and through announcements on iLearn. Queries to the convenor can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn.

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 is 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 workshops

Both lab-based practical classes and online workshops are designed to develop microbiology laboratory skills, safety practices and critical and analytical thought. In order to be able to work safely and effectively in the practical classes, please make sure to read through laboratory notes to prior to each practical session commencing, to familiarise yourself with planned work and ensure you are aware of biosafety considerations for the coming class.

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 it is recommended that you attempt problems from the lectures, textbook and other resources.

Required and Recommended Texts and Materials

You will be expected to bring a lab coat, closed shoes and lab notebook to each practical and to regularly refer to practical manual notes in class (either hardcopy or electronic). A Laboratory Practical Manual and Workshop folder, outlining planned activities for the workshop and laboratory sessions, will be available on iLearn for download prior to the session, to enable you to prepare for the scheduled classes.

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 workshops are all integral components of the unit. An 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). 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). 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) 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 connect.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/

Academic Success

Academic Success 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 the Service Connect Portal, 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

To enable students more time to focus on learning, understanding and reflecting on the content of our unit we have revised the assessment structure as follows. There are now only three assessments: an independent research project, laboratory book and final exam. Although no marks are associated with attendance, all activities provide you with key content designed to help you understand content and complete the assessments.

Unit information based on version 2025.04 of the Handbook