UNSW Course Outline

# MICR3071 Environmental Microbiology - 2024

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## General Course Information

**Course Code :** MICR3071
**Year :** 2024
**Term :** Term 1
**Teaching Period :** T1
**Is a multi-term course? :** No
**Faculty :** Faculty of Science
**Academic Unit :** School of Biotechnology and Biomolecular Sciences
**Delivery Mode :** In Person
**Delivery Format :** Standard
**Delivery Location :** Kensington
**Campus :** Sydney
**Study Level :** Undergraduate
**Units of Credit :** 6

**Useful Links**

Handbook Class Timetable

## Course Details & Outcomes

### Course Description

The field of Environmental Microbiology offers great potential for the development of new and innovative strategies and products for the management and protection of the environment. Microorganisms underpin every environment on Earth. In this course, students learn of the vital

role of microbes in marine, freshwater,and terrestrial ecosystems by exploring the dynamic interactions that take place between microbial communities, the surroundings, and higher organisms. A series of lectures and practical sessions cover key themes in contemporary environmental microbiology including microbial diversity and function, communication, adaptation to extreme environments, and biogeochemical cycling. This course actively addresses key UN Sustainable Development Goals, including SDG13 (Climate Action), SD14 (Life Below Water), SDG15 (Life on Land), and SDG10 (Reduced Inequalities). This course also engages, values, and incorporates Indigenous Knowledge into learning outcomes. Students will also gain theoretical and practical experience in the latest cutting-edge techniques used to study microbial ecosystem function. Laboratory sessions allow students to gain experience in experimental design and practical skills of research in the context of mini-research projects involving environmental issues. An online component of the course is used to support laboratory activities and help students track their own progress and understanding of the course content. This course emphasises how the principles and techniques of Environmental Microbiology can be applied to a range of environmental problems – especially those faced as a result of global climate change - and lead to the development of sustainable resources and commercial applications, as expanded in Environmental Biotechnology (BIOT3081). Note: Highly recommended: MICR2011, BIOC2201, BIOS2021 or BIOS2621.

## Course Aims

The course is designed to give you an up-to-date understanding of modern research in this field and the link between laboratory-based research and application in the field. As a higher-level subject, students gain an insight into the contemporary theory and practice of microbial ecology, which endeavours to overcome the significant limitations of classical microbiology.

The structure of the laboratory sessions is designed to give you training in the practical skills necessary for both the workplace and preparation for Honours, and is applicable whether you plan to continue you career in academic research, industry or any work that requires contact with science and research. There is an emphasis on planning and carrying out practical tasks as members of a group, as this is a realistic parallel to â??life after University â??, however the writing of scientific reports on the results you obtain in the laboratory is an individual responsibility.

## Relationship to Other Courses

This course is double badged with a postgradute course, MICR9071.

# Course Learning Outcomes

| Course Learning Outcomes |
| --- |
| CLO1 : Discuss microbial ecology concepts including:a) Factors that limit microbial growth in natural habitatsb) Methods for studying microbial populations and their function in the natural environmentc) Ecological principles and mechanisms of microbial interactions within mixed microbial communities and between microorganisms and higher organismsd) The effect of microorganisms on the global environment eg: their role in cycling of elementse) The application of microbial ecological principles for industrial, environmental or public health benefits |
| CLO2 : Test scientific hypotheses via experimental design, analyse results and discuss outcomes in the light of the current body of knowledge (e.g. literature) |
| CLO3 : Critically evaluate scientific output. This includes self generated, peer generated and published literature |
| CLO4 : Demonstrate effective written and verbal scientific communication skills |

| Course Learning Outcomes | Assessment Item |
| --- | --- |
| CLO1 : Discuss microbial ecology concepts including:a) Factors that limit microbial growth in natural habitatsb) Methods for studying microbial populations and their function in the natural environmentc) Ecological principles and mechanisms of microbial interactions within mixed microbial communities and between microorganisms and higher organismsd) The effect of microorganisms on the global environment eg: their role in cycling of elementse) The application of microbial ecological principles for industrial, environmental or public health benefits | • Mid-Term Quiz<br>• Final Exam |
| CLO2 : Test scientific hypotheses via experimental design, analyse results and discuss outcomes in the light of the current body of knowledge (e.g. literature) | • Laboratory Assignment - Major research project paper |
| CLO3 : Critically evaluate scientific output. This includes self generated, peer generated and published literature | • Laboratory Assignment - Major research project paper |
| CLO4 : Demonstrate effective written and verbal scientific communication skills | • Poster and Presentation<br>• Laboratory Assignment - Major research project paper |

# Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Echo 360

# Learning and Teaching in this course

The goal is that students immerse themselves in the field of environmental microbiology where they can learn in a safe and welcoming space. In this course, I will make an effort to expose you to literature from a diverse group of scientists, despite limits still existing on this diversity. I acknowledge that it is possible that there may be both overt and covert biases in the material due to the lens with which it was written, even though the material is primarily of a scientific nature. Integrating a diverse set of experiences is important for a more comprehensive understanding of science.

This course will aim to create a learning environment for students that supports a diversity of thoughts, perspectives and experiences, and honours identities (including race, gender, class, sexuality, religion, ability). To help accomplish this:

- If students choose, please let the course coordinator and the class know your chosen name and pronouns.
- As a participant in course discussions, students should strive to honor the diversity of classmates (e.g., use appropriate pronouns and names, make sure all voices are being heard, etc.).
- If students feel their performance in the class is being impacted by experiences outside of class, please do not hesitate to come and talk with the course coordinator.

For the labarorty component the aim is that students get a ‘taste’ of research; from having a set of hypotheses/aims, to experimental design, carrying out specific experiments with protocols provided, analysing data, and finally writing up the project at the end in report form. What students as an individual and/or small research group want to experience is how to take a hypothesis and address it using the tools provided. In the end it is a learning experience, and making mistakes is ok. Preparation is key, both with some background reading as well as rationally thinking and designing a given experiment before commencing in the lab. For example thinking about how long something will take, what is needed, controls/replicates.

Students will be given the tools to aim to solve a problem.

# Additional Course Information

**SUSTAINABILITY AND INDIGENOUS KNOWLEDGE:**

The United Nations Sustainable Development Goals (SDGs) or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". As detailed in the overview earlier, this course actively addresses key UN SDGs,

including SDG13 (Climate Action), SD14 (Life Below Water), SDG15 (Life on Land), and SDG10 (Reduced Inequalities). As course convenor I am keen to transfer my passion for the environment and the need to build a sustainable future to the next generation, and I hope this course will inspire and be a vehicle to enable changes in thinking and everyday practice.

This course also engages, values, and incorporates Indigenous Knowledge into learning outcomes. The goal is that this course can help bridge gaps in recognising the significance of Indigenous knowledge in science teachings. Indigenous engagement on Country is critical to help protect Australia's biodiversity and utilise their extensive knowledge in caring for the land. Sharing of Indigenous knowledge in undergraduate teaching can ensure students are better equipped to be part of a catalyst of change in increasing opportunities for First Nations people.

# Assessments

## Assessment Structure

| Assessment Item | Weight | Relevant Dates |
|---|---|---|
| Mid-Term Quiz | 10% | Start Date: Not Applicable<br>Due Date: Week 4: 04 March - 10 March<br>Post Date: 06/03/2024 12:00 AM |
| Poster and Presentation | 15% | Start Date: Not Applicable<br>Due Date: Week 10: 15 April - 21 April<br>Post Date: 16/04/2024 12:00 AM |
| Laboratory Assignment - Major research project paper | 35% | Start Date: Not Applicable<br>Due Date: Week 11: 22 April - 28 April<br>Post Date: 24/04/2024 04:00 PM |
| Final Exam | 40% | Start Date: Not Applicable<br>Due Date: To be determined by exam schedule<br>Post Date: 01/05/2024 12:00 AM |

## Assessment Details

### Mid-Term Quiz

Assessment Overview

The purpose of this quiz is to provide students with the opportunity to assess their progress and understanding during the session. This quiz will consist of short answer questions which will cover the lecture material, tutorial and practical session.

Marks and feedback will be released online in Moodle or face-to-face in a tutorial/ practical class. Individual feedback will be provided upon students' request.

Course Learning Outcomes

- CLO1 : Discuss microbial ecology concepts including:a) Factors that limit microbial growth in natural habitatsb) Methods for studying microbial populations and their function in the natural environmentc) Ecological principles and mechanisms of microbial interactions within mixed microbial communities and between microorganisms and higher organismsd) The effect of microorganisms on the global environment eg: their role in cycling of elementse) The application of microbial ecological principles for industrial, environmental or public health benefits

Detailed Assessment Description

The purpose of this quiz is to provide you with the opportunity to assess your progress and understanding early on in the course. You will be expected to answer four (4) short answer style questions.

Material being assessed covers lecture and tutorial material up to Week 4. This mid-term quiz will occur in the tutorial session (1 hour duration) in Week 4.

This assessment task addresses CLO1 and CLO4.

Assessment Length

Students have four (4) short answer questions within a 50 min timelimit.

Submission notes

Total number of questions to be attempted:  Four (4) . This mid-term is worth 10 % of the total grade for this course (each question weighted equally)

Assessment information

Please refer to Moodle for any additional information.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

## Poster and Presentation

Assessment Overview

This is a group work where students will be asked to choose a topic of interest related to environmental microbiology. Further guidance will be provided during the laboratory and tutorial sessions.

Marks and feedback will be released online in Moodle or face-to-face in a tutorial/ practical

class. Individual feedback will be provided upon students' request.

**Course Learning Outcomes**

- CLO4 : Demonstrate effective written and verbal scientific communication skills

**Detailed Assessment Description**

This is an exercise in information literacy and presentation skills and thus will be assessing learning outcomes 3 and 4.

This is a group task where you will be expected to choose a topic of interest related to environmental microbiology, research this topic, and prepare and deliver a presentation to the class.

You will be assessed on your ability to demonstrate a high level of critique of the chosen topic, have a logical flow and structure to the talk, and show an ability to answer questions and lead a discussion in question time.

This assessment task addresses CLO1 and CLO4.

**Assessment Length**

Each group talks for ca. 15 min with 5 min for questions

**Submission notes**

Designed to develop student information literacy and presentation skills.  Student groups select a topic of interest in environmental microbiology  Literature search, gather info  Present your findings as an oral presentation in week 10 in the form of a ‘mini-conference’

**Assessment information**

Please refer to Moodle for additional relavent information on this task.

**Assignment submission Turnitin type**

This is not a Turnitin assignment

## Laboratory Assignment - Major research project paper

**Assessment Overview**

This assignment will be in the format of a scientific paper. Although the lab work will be done as

a group, the report on that work must be done individually. More detailed information on this project and guidance on scientific report writing will be given during tutorial and laboratory sessions.

Marks and feedback will be released online in Moodle or face-to-face in a tutorial/ practical class. Individual feedback will be provided upon students' request.

**Course Learning Outcomes**

- CLO2 : Test scientific hypotheses via experimental design, analyse results and discuss outcomes in the light of the current body of knowledge (e.g. literature)
- CLO3 : Critically evaluate scientific output. This includes self generated, peer generated and published literature
- CLO4 : Demonstrate effective written and verbal scientific communication skills

**Detailed Assessment Description**

This is a report on the research project that you and your group will be planning and carrying out during weeks 2-8. You will be expected to write up your findings from your lab project in the format of a scientific paper.

The purpose of this assessment is to expose you to scientific research where you will be able to demonstrate your understanding of designing and conducting experiments, addressing hypotheses, and writing up findings.

You will be assessed on your ability to analyse results obtained from experiments you have obtained and discuss outcomes in context with the literature.

The assessment for this project is in two parts, the submission of a draft report in week 7, and the submission of a final report in week 11. Detailed individual feedback will be provided on draft reports to help you with your preparation for your final report.

This assessment task addresses CLO2, CLO3, and CLO4

**Assessment Length**

There is not a prescribed length for this task however students should aim for 10-15 pages

**Submission notes**

More details on submission are provided throughout the course; reports will be submitted as a pdf (emailed to the course convenor)

**Assessment information**

More details will be provided on moodle.

**Assignment submission Turnitin type**

This is not a Turnitin assignment

## Final Exam

**Assessment Overview**

The exam will consist of two parts, a short answer section and an essay section which will test the students on their knowledge gained throughout the course.

Mark/grade will be released to students on official assessment results release date.

**Course Learning Outcomes**

- CLO1 : Discuss microbial ecology concepts including:a) Factors that limit microbial growth in natural habitatsb) Methods for studying microbial populations and their function in the natural environmentc) Ecological principles and mechanisms of microbial interactions within mixed microbial communities and between microorganisms and higher organismsd) The effect of microorganisms on the global environment eg: their role in cycling of elementse) The application of microbial ecological principles for industrial, environmental or public health benefits

**Detailed Assessment Description**

The purpose of the final exam is to provide you with the opportunity to assess your understanding of major themes and topics covered throughout the course. This is an indivdual assessment.

The exam occurs during the formal examination period and will last for 2 hours.

You will be expected to answer four (4) essay-type questions worth equal marks (10% each).

Material assessed is all lecture and tutorial content covered during the course (Weeks 1-5, Weeks 7-10). Topics will be broad with the opportunity to incorporate different aspects of course content into your answers to show a comprehensive understanding of microbiology at micro and macro scales in the environment.

This task addresses CL01 and CLO4.

**Assessment Length**

The two-hour paper will consist of four (4) essay-type questions worth equal marks (10% each).

**Submission notes**

Students will have eight (8) question options and will need to choose four (4) questions to

answer. As the questions are essay-type the aim is for students to demonstrate a broad and holistic understanding of different aspects of the course. The focus in the final exam is on content after the mid-term (Weeks 5-10) however given the general broad nature of questions and overlapping themes throughout the course

**Assessment information**

Please refer to details on Moodle given throughout the course.

**Assignment submission Turnitin type**

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

# General Assessment Information

More details related to submission of tasks, format will be provided in Week 1 and throughout the course with reminders using different platforms (Moodle, Teams, in-person).

**Grading Basis**

Standard

**Requirements to pass course**

In order to pass this subject, students must:

1. Satisfactorily complete all parts of the continuous assessment.
2. Attend at least **80%** of prescribed practical classes and tutorials.

# Course Schedule

| Teaching Week/Module | Activity Type | Content |
|---|---|---|
| Week 1 : 12 February - 18 February | Lecture | Lecture 1 - Introduction to course (Brendan Burns)<br>This lecture is the introductory course lecture containing an introduction to your course convenor (Brendan Burns) and relevent course info, how the course is run, logistics, assessments.<br><br>Lecture 2 - Microbial Interactions I (SuHelen Egan)<br>This lecture is first in a series of three lectures by Associate Professor SuHelen Egan, where the importance and intricacies of microbial interactions are discussed.<br>This lecture (Microbial Interactions I) you will learn of the concepts of 'microbial social behaviour' and the key phenomenon of microbial signalling.<br><br>Lecture 3 - Microbial Interactions II (SuHelen Egan)<br>This lecture is the second in a series of three lectures by Associate Professor SuHelen Egan, where the importance and intricacies of microbial interactions are discussed.<br>This lecture (Microbial Interactions II) you will learn further on quorum sensing and the importance in microbial community function. |
| Week 2 : 19 February - 25 February | Lecture | Lecture 4 - Microbial Interactions III (SuHelen Egan)<br>This lecture is the third and last in a series of three lectures by Associate Professor SuHelen Egan, where the importance and intricacies of microbial interactions are discussed.<br>This lecture (Microbial Interactions III) you will learn about the different kinds of symbiotic interactions that microorganisms engage in, and discuss how an understanding of microbial interactions can benefit society.<br><br>Lecture 5 - Biofilms I (Brendan Burns)<br>This lecture is the first in a series of two lectures by Associate Professor Brendan Burns, where the phenomenon of biofilms is described<br>This lecture (Biofilms I) you will learn about what biofilms are, why they form, and examples of where they are found in different natural, industrial, and medical settings.<br><br>Lecture 6 - Biofilms II (Brendan Burns)<br>This lecture is the second in a series of two lectures by Associate Professor Brendan Burns, where the phenomenon of biofilms is described<br>This lecture (Biofilms II) you will learn more about how biofilms are formed, regulated and how we can target and manipulate them to help solve issues with biofilms in industrial and medical settings. |
| | Laboratory | Lab - Introduction to Research project and experimental planning<br>There is no wet laboratory component this week. You will be provided with course information and plan experiments for the research project. The computer laboratory will be available for looking through the lab information and answering questions provided. You may also begin with literature searches and designing experiments. For the research project you are expected to form into working groups of 4-5 students. |
| | Tutorial | This slot is for further discussion on the lab project and to continue experimental planning and preparation. |
| Week 3 : 26 February - 3 March | Lecture | Lecture 7 - Microbes and the tree of life (Brendan Burns)<br>This lecture is the first in a series of lectures all on different methods (and their evolution through time) used to study microbes in the environment, and how this improves our understanding of microbial function and dynamics. This lecture (Tree of Life) from Associate Professor Brendan Burns you will get an introduction to the importance of different methods in the field of environmental microbiology and what challenges researchers face.<br><br>Lecture 8 - Methods to detect microbes (Belinda Ferrari)<br>This lecture is the second in a series of lectures all on different methods (and their evolution through time) used to study microbes in the environment, and how this improves our understanding of microbial function and dynamics. This lecture (Methods to detect Microbes) from Professor Belinda Ferrari who will tell you all about to study the diversity of extreme organisms such as those found in Antartica.<br><br>Lecture 9 - Metagenomics (Torsten Thomas)<br>This lecture is the third in a series of lectures all on different methods (and their evolution through time) used to study microbes in the environment, and how this improves our understanding of microbial function and dynamics. |

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|---|---|---|
| | | This lecture (Metagenomics) from Professor Torsten Thomas who will tell you all about the use of this next generation sequencing tool of metagenomics. |
| | Laboratory | This week you will continue experimental planning for the major research project and should also look at setting up the first of your experiments. |
| | Tutorial | In this tutorial the concepts of using biosensors as a tool in environmentral micrbiobiology will be covered, with specific emphasis on its use in the lab component of the course which will help students with their planning and understanding of experiments to be undertaken. |
| Week 4 : 4 March - 10 March | Lecture | Lecture 10 - Metaproteomics (Tim Williams)<br>This lecture is the fourth in a series of lectures all on different methods (and their evolution through time) used to study microbes in the environment, and how this improves our understanding of microbial function and dynamics. This lecture (Metaproteomics) from Dr Tim Williams who will take it to the next level of 'omics - the global proteome.<br><br>Lecture 11 - Microbial Ecology (Brendan Burns)<br>This lecture will introduce students to the important concepts of microbial ecology and its relavance in diofferent environments.<br><br>Lecture 12 - Sensing trouble and adapting I (Brendan Burns)<br>This lecture is the first in a series of two lectures all on how microbes sense trouble in teh environment...and how they adapt. This lecture (Sensing trouble and adapting I) from Brendan Burns you will hear all about how microbes adapt to extreme temperatures. |
| | Laboratory | This week you will continue setting up experiments for the major research project. |
| | Assessment | Mid-term quiz (10%)<br><br>The purpose of this quiz is to provide students with the opportunity to assess their progress and understanding during the term. The mid-term will be held in the tutorial slot in Week 4 and will consist of short answer questions, which will cover material from the lecture, tutorial and practical session and aim to assess course learning outcomes 1 and 2. |
| Week 5 : 11 March - 17 March | Lecture | Lecture 13 - Sensing trouble and adapting II (Brendan Burns)<br>This lecture is the second in a series of two lectures all on how microbes sense trouble in the environment...and how they adapt. This lecture (Sensing trouble and adapting II) from Brendan Burns you will hear all about how microbes adapt to nutrient stress....what to do when they are hungry.<br><br>Lecture 14 - Microbes on the move (Matthew Baker)<br>This lecture, given by Associate Professor Matthew Baker, covers the critical process of microbial motility and how it is an essential phenomenon that shapes many microbial communities in the environment.<br><br>Lecture 15 - Microbes transforming the Earth - Carbon (Brendan Burns)<br>This lecture is the first in a series of three lectures all on how microbes drive all major nutrient cycles on this pale blue dot of ours....welcome to the world of microbial biogeochemical cycling. This lecture (Carbon cycling) from Brendan Burns you will hear all about how microbes get their carbon in many weird and wonderful ways, and how it is critical for our survival. |
| | Laboratory | This week you will continue setting up experiments for the major research project. |
| | Tutorial | In this tutorial students will receive details and begin planning and preparation for their group presentaion they will give at the end of the term on a review topic of their choice. |
| Week 6 : 18 March - 24 March | Other | As this is flexi week there are no prescribed tasks. |
| Week 7 : 25 March - 31 March | Lecture | Lecture 16 - Microbes transforming the Earth - Nitrogen (Brendan Burns)<br>This lecture is the second in a series of three lectures all on how microbes drive all major nutrient cycles on this pale blue dot of ours....welcome to the world of microbial biogeochemical cycling. This lecture (Nitrogen cycling) from Brendan Burns you will hear all about how microbes can use all different forms of nitrogen to survive...and how they are major players in the marine nitrogen cycle.<br><br>Lecture 17 - Microbes transforming the Earth - Sulphur (Brendan Burns)<br>This lecture is the third in a series of three lectures all on how microbes drive all major nutrient cycles on this pale blue dot of ours....welcome to the world of microbial biogeochemical cycling. This lecture (Sulphur cycling) from Brendan Burns you will hear all about how microbes can use all different forms of sulphur to survive...and their impacts on both industry and understanding survival in the most extreme environments on Earth. |

| | | |
|---|---|---|
| | Laboratory | This week you will continue setting up experiments for the major research project. |
| | Tutorial | Marine isolates ID - BLAST Tutorial<br>In this tutorial students will learn the concepts of how to accurately identify unknown micoorganisms based on 16S rDNA analyses. |
| | Assessment | Draft report of lab report due (Wed 27 March) |
| Week 8 : 1 April - 7 April | Lecture | Lecture 18 - The future of studying the past: microbial mats (Brendan Burns)<br>This lecture (The future of studying the past: microbial mats) is where I get to indulge on these amazing ecosystems called microbial mats and stromatolites that my research group works in. Not only are they really amazing systems but you will see that many of the course themes intersect in the study of these biological wonders...<br><br>Lecture 19 - Human microbiome (Steven Leach)<br>This lecture (Human Microbiome) is one of the rare ones in the course where humans are the subject and there is some medical relevance in there if that is your jam. Dr Steven Leach works up at the Prince of Wales Children Hospital, and in this ;lecture you will learn all about the human Microbiome with a particular emphasis on the effects of microbiome changes can have on children. |
| | Laboratory | This week you will continue setting up experiments for the major research project. |
| | Tutorial | Individual feedback will be provided on your draft report in this tutorial session and will be open for discussion. |
| Week 9 : 8 April - 14 April | Lecture | Lecture 20 - Ancient archaea and teh rise of complex life (Brendan Burns)<br>This lecture (Ancient archaea and the rise of complex life) follows a bit on my last one on microbial mats, but where I focus on a particular group of really cool microbes - the Asgard archaea - that may be key to understanding the evolution of eukaryotes...they may be our great ancestors.<br><br>Lecture 21 - Microbial diversity and drug discovery (Brendan Burns)<br>This lecture (Microbial diversity and drug discovery) is one lecture where I focus on applications that come out of studying microbial diversity...specifically in the field of natural products and drug discovery, a multi-billion dollar industry.<br><br>Lecture 22 - Indigenous knowledge and microbiology (Brendan Burns)<br>This lecture (Indigenous knowledge and microbiology) is where the importance if Indigenous knowledge in science is discussed, with specific examples on advances in microbiology. |
| | Tutorial | Open session for discussion. |
| | Assessment | First week of group presentation talks (Tues April 9). |
| Week 10 : 15 April - 21 April | Lecture | Lecture 23 - Waste and drinking water microbiology (Michael Storey)<br>This lecture is presented by and industrial partner, Dr Michale Storey, who works in the water industry and will prvide and industry perspective to isses of water quality and management in relation to microbiology.<br><br>Lecture 24 - Course summary (Brendan Burns)<br>This lecture (Course summary) is where I wrap everything up in the course that was. Covering what I hope you got out of the course at different levels, and will end off with more tips/advice for your final exam. |
| | Tutorial | Course review and help for students to prpepare for final exam. |
| | Assessment | Second week of groups presentation talks (Tues April 16). |
| Week 11 : 22 April - 28 April | Assessment | Final report of lab report due (Wed April 26). |

# Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

# General Schedule Information

Students will be notified well in advance if there are changes to the schedule.

# Course Resources

## Prescribed Resources

There is no set text assigned to this course and you will receive recent articles on relevant topics throughout the course.

## Recommended Resources

**Recommended journals for extra reading**

| | |
|---|---|
| The ISME journal | Microbial Biotechnology |
| Aquatic Microbial Ecology | Microbial Ecology |
| Advances in Microbial Ecology | Microbiology |
| Current Opinions in Microbiology | Biofouling |
| Applied and Environmental Microbiology | Trends in Biotechnology |
| Trends in Microbiology | Extremophiles |
| Environmental Microbiology | Journal of Bacteriology |
| FEMS Microbiology Ecology | Molecular Microbiology |
| Marine Ecology Progress Series | PNAS |

## Additional Costs

There are no additional costs for this course.

## Course Evaluation and Development

At the end of the course student evaluative feedback on the course may be gathered, using UNSW's myExperience Process. Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback. Significant changes to the course will be communicated to subsequent cohorts of students taking the course. If you would like to make suggestions at any time during the course please feel free to discuss this with the course convenor.

# Staff Details

| Position | Name | Email | Location | Phone | Availability | Equitable Learning Services Contact | Primary Contact |
|---|---|---|---|---|---|---|---|
| Convenor | Brendan Burns | | Room 4101, Biosciences Building (D26) | +61405453242 | On request, best initial contact via email. | No | Yes |

# Other Useful Information

## Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the UNSW Student Code of Conduct Website.

## Academic Honesty and Plagarism

**Referencing** is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.
Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

**Academic integrity** is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.
Further information about academic integrity, plagiarism and the use of AI in assessments can

be located at:

- The Current Students site,
- The ELISE training site, and
- The Use of AI for assessments site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct

## Submission of Assessment Tasks

### Penalty for Late Submissions

UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

***Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.***

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

### Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

**Important note**: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination

or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

## Faculty-specific Information

### Additional support for students

- The Current Students Gateway
- Student Support
- Academic Skills and Support
- Student Wellbeing, Health and Safety
- Equitable Learning Services
- UNSW IT Service Centre
- Science EDI Student Initiatives, Offerings and Guidelines