



# BIOX1310

## Organisms to Ecosystems

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

*School of Natural Sciences*

### Contents

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|   |   |
|---|---|
| <a href="#"><u>General Information</u></a>            | 2 |
| <a href="#"><u>Learning Outcomes</u></a>              | 3 |
| <a href="#"><u>General Assessment Information</u></a> | 3 |
| <a href="#"><u>Assessment Tasks</u></a>               | 4 |
| <a href="#"><u>Delivery and Resources</u></a>         | 7 |
| <a href="#"><u>Unit Schedule</u></a>                  | 8 |
| <a href="#"><u>Policies and Procedures</u></a>        | 9 |

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit convenor

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Consultation via appointment

Tutorial coordinator

Larissa Trompf

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Consultation via appointment

Credit points

10

Prerequisites

Corequisites

Co-badged status

BIOL1310

Unit description

This unit introduces students to the essential concepts in current biology. BIOX1310 forms the first step for students pursuing a career in the biological sciences, and provides a basis for students in other disciplines who wish to maintain an interest in this dynamic field. The theme of this unit is evolution. The first part of the unit is concerned with the origin of life and discusses current theories on how life may have arisen on a previously lifeless planet. We discuss evolutionary theory in detail including some of the genetic principles that underlie evolution. In the second part we introduce the major groups of organisms examining their diversity and how they function. In the final part we discuss the ecological interactions between organisms from the small scale to global patterns. Throughout the unit, these core concepts are illustrated with examples from current research. BIOX1310 is designed as a companion unit to BIOX1110 in Session 2 and requires attendance at an on-campus session.

## 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:** Define evolution and describe its main mechanisms

**ULO2:** Define the major evolutionary transitions of organisms on earth

**ULO3:** Differentiate the main groups of organisms and interpret their evolutionary relationships

**ULO4:** Contrast major ecological processes and describe biogeographical patterns

**ULO5:** Synthesise experimental results and information from the scientific literature to prepare a scientific report

**ULO6:** Demonstrate foundational learning skills including active engagement in the learning process

## General Assessment Information

### 1. Requirements to Pass this Unit

To pass this unit you must:

**(a)** Participate in, and undertake all hurdle activities for, a minimum of 3 of the 4 days of scheduled block practical classes, and

**(b)** Achieve an overall assessment mark equal to or greater than 50%

### Hurdle assessment: Practical attendance

Development of knowledge and skills requires continual practice at authentic problems in a laboratory-based setting. For OUA students, this unit has on-campus laboratory classes scheduled for 3 days throughout the teaching session (see below), plus an additional 1 day online class. You must demonstrate your progress in developing and communicating knowledge and skills in at least 3 of these 4 days of class time. This is a hurdle assessment, meaning that failure to meet this requirement may result in a **fail** grade for the unit. Students are permitted an absence up to the equivalent of one day: **additional absences will require you to apply for [Special Consideration](#)** (see below).

### 2. 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](#).

### Assessments where Late Submissions will be accepted:

Assessment 1 (Research report) – standard late penalty applies.

### 3. 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.

*Written Assessments:* If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through [ask.mq.edu.au](mailto:ask.mq.edu.au).

*Practice-based tasks:* To pass the unit you need to demonstrate ongoing development of skills and application of knowledge in at least 3 of the 4 scheduled 1-day practical sessions. If you miss a practical session due to a serious, unavoidable and significant disruption, contact the unit's tutorial convenor ASAP (via email: [biol1310@mq.edu.au](mailto:biol1310@mq.edu.au)) as you may be able to attend another class.

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

Note that for OUA students, a Special Consideration should **only be applied for** if you miss more than **one** of the scheduled 1-day **practical sessions**.

### 4. Assessment Activities and other information

Pre-practical quizzes and the mid-semester test will be administered online via the Biol1310 iLearn site. You will submit your research report via an upload link provided on this site.

Assessment outcomes and feedback will be provided via the 'gradebook' function of the Biol1310 iLearn site.

## Assessment Tasks

| Name                                     | Weighting | Hurdle | Due                        |
|--|-----------|--------|----------------------------|
| <a href="#">Research Report</a>          | 30%       | No     | Week 11                    |
| <a href="#">Final exam</a>               | 40%       | No     | TBA                        |
| <a href="#">Weekly Practical Classes</a> | 5%        | Yes    | Block sessions (see below) |

| Name                                  | Weighting | Hurdle | Due        |
|---------------------------------------|-----------|--------|------------|
| <a href="#">Pre-practical Quizzes</a> | 10%       | No     | Weekly     |
| <a href="#">Mid-semester test</a>     | 15%       | No     | 03/04/2023 |

## Research Report

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

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 11**

Weighting: **30%**

In this assignment you will write a short research report on an experiment we have conducted in the practicals. The report will be in the style of a scientific paper, but somewhat shorter. It will contain a title, introduction, methods, results (with figures and/or tables), discussion and reference list. Prior to this, a practical will be dedicated to explaining all elements of the research report and marking rubric.

On successful completion you will be able to:

- Define evolution and describe its main mechanisms
- Contrast major ecological processes and describe biogeographical patterns
- Synthesise experimental results and information from the scientific literature to prepare a scientific report

## Final exam

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

Indicative Time on Task <sup>2</sup>: 8 hours

Due: **TBA**

Weighting: **40%**

The final exam will be held during the Formal Examination Period, and may consist of a mixture of multiple choice and short-length answer questions. The exam will cover all Lecture and Practical material presented in the unit. The University will announce the examination date towards the end of semester. We will relay that date via an announcement in Lectures and via iLearn.

On successful completion you will be able to:

- Define evolution and describe its main mechanisms
- Define the major evolutionary transitions of organisms on earth
- Differentiate the main groups of organisms and interpret their evolutionary relationships
- Contrast major ecological processes and describe biogeographical patterns
- Synthesise experimental results and information from the scientific literature to prepare a scientific report

## Weekly Practical Classes

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

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

Due: **Block sessions (see below)**

Weighting: **5%**

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

Development of knowledge and skills requires continual practice at authentic tasks. In each weekly practical class, you will undertake a range of activities and record your progress in a lab book. To pass this hurdle assessment, you must be able to demonstrate your progress in developing and communicating knowledge and skills in a minimum of 80% of practical classes.

On successful completion you will be able to:

- Synthesise experimental results and information from the scientific literature to prepare a scientific report
- Demonstrate foundational learning skills including active engagement in the learning process

## Pre-practical Quizzes

Assessment Type <sup>1</sup>: Quiz/Test

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

Due: **Weekly**

Weighting: **10%**

Weekly practical quizzes are required to be undertaken prior to the start of the practical class. The purpose of the quiz is to ensure that you are familiar with the activities of the practical and the biological concepts they cover.

On successful completion you will be able to:

- Define evolution and describe its main mechanisms
- Define the major evolutionary transitions of organisms on earth
- Differentiate the main groups of organisms and interpret their evolutionary relationships
- Contrast major ecological processes and describe biogeographical patterns
- Demonstrate foundational learning skills including active engagement in the learning process

## Mid-semester test

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

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **03/04/2023**

Weighting: **15%**

The mid-semester test will cover lecture and practical material, and will consist of multiple choice.

On successful completion you will be able to:

- Define evolution and describe its main mechanisms
- Define the major evolutionary transitions of organisms on earth
- Differentiate the main groups of organisms and interpret their evolutionary relationships
- Contrast major ecological processes and describe biogeographical patterns

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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

### 1. Methods of communication

Unit staff will communicate with you via email to your **university email address** or through announcements on iLearn. It is therefore critical that you regularly check your university email inbox. Queries to convenors can either be placed on the iLearn discussion board or sent to [biol1310@mq.edu.au](mailto:biol1310@mq.edu.au) from your **university email** address.

## 2. Lectures

Two 1-hour lectures will be available for you to stream and/or download via the unit's iLearn site on the Monday of each week during the teaching session. It is important for students to follow these lectures across the session because the material is closely linked to the compulsory practical classes and associated assessment tasks.

## 3. Practicals

On-campus practical classes will be held in block sessions over three days. There are two streams. Students can select to attend either **Stream A** or **Stream B**:

**Stream A:** 25 March & 18-19 April, on-campus in 06WW-106.

**Stream B:** 26 March & 20-21 April, on-campus in 06WW-106.

An additional **online** practical will be conducted in Week 11/12 (dates to be communicated in advance via the Biol1310 iLearn site).

For reasons of personal safety, **fully enclosed footwear is mandatory for admission into the teaching laboratories.**

## 4. COVID-19 policy

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.

# Unit Schedule

Schedule of Lectures:

| WEEK | TOPIC                      | Lecture schedule ( <i>Provisional</i> ):             | STAFF |
|------|----------------------------|--|-------|
| 1    | Welcome to Biology/BIO1310 | 1. Welcome & Unit information                        | DK    |
|      |                            | 2. The diversity of life                             | DK    |
| 2    | Life as we know it         | 3. How did life start on earth?                      | MG    |
|      |                            | 4. Major transitions of life                         | MG    |
| 3    | Evolution & Genetics       | 5. Darwin's theory of evolution                      | MG    |
|      |                            | 6. Basic genetic principles & the 'modern synthesis' | MG    |
| 4    | Mechanisms of evolution    | 7. Mechanisms I. Selection, mutation, gene flow      | DK    |



|    |   |   |    |
|----|---|---|----|
|    | <i>(microevolution)</i>                             | 8. Mechanisms II. Sex & recombination           | DK |
| 5  | <b>Species, speciation &amp; phylogenies</b>        | 9. The species concept/speciation               | DK |
|    | <i>(macroevolution)</i>                             | 10. Phylogenies                                 | DK |
| 6  | <b>Cells, prokaryotes &amp; eukaryotes</b>          | 11. Cellular structure/function: pro/eukaryote  | MG |
|    |   | 12. Bacterial evolution                         | MG |
| 7  | <b>Unicellular &amp; multicellular organisms</b>    | 13. From unicellularity to multicellularity     | MG |
|    |   | 14. Fungi                                       | MG |
| 8  | <b>Plants</b>                                       | 15. Plants as living multicellular organisms    | DK |
|    |   | 16. Diversity of plants                         |    |
| 9  | <b>Animals</b>                                      | 17. The evolutionary history of animals         | DK |
|    |   | 18. Diversity of animals (largely metazoa)      | DK |
| 10 | <b>Development, life history &amp; reproduction</b> | 19. Development & life history                  | DK |
|    |   | 20. Reproduction                                | DK |
| 11 | <b>Behaviour &amp; plant/animal interactions</b>    | 21. Animal & plant behaviour                    | DK |
|    |   | 22. Plant-animal interactions (& co-evolution)  | DK |
| 12 | <b>Ecology &amp; Biogeography</b>                   | 23. Ecology I                                   | DK |
|    |   | 24. Biogeography (animal & plant distributions) | DK |
| 13 | <b>Pop, community &amp; ecosystems ecology</b>      | 25. Ecology II                                  |    |
|    |   | 26. Ecology III                                 |    |

## 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 \(https://students.mq.edu.au/su\)](https://students.mq.edu.au/su)

[pport/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 <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.