



# BIOL1310

## Organisms to Ecosystems

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

*School of Natural Sciences*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

Unit convenor and teaching staff

Convenor

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Credit points

10

Prerequisites

Corequisites

Co-badged status

BIOX1310

### Unit description

This unit introduces students to the essential concepts in current biology. BIOL1310 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. BIOL1310 is designed as a companion unit to BIOL1110 in Session 2.

## 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 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

**In order to pass this unit, students must:**

- (a) achieve an overall assessment mark of greater than 50%, and;
- (b) attend and participate in at least 80% of the scheduled practical classes.

### Academic Honesty – this is very important

Presenting the work of another person as one's own is a serious breach of the University's rules and carries significant penalties. The University's Academic Honesty Policy can be found at [http://www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html)

In this unit, we will be checking written work for plagiarism using the web-based TURNITIN application. This application will check for similarity between your submitted work and all of the existing published scientific literature, across all websites, and across all work submitted previously (and contemporaneously) by Macquarie university students.

Depending upon the severity or extent of plagiarism, penalties may range from a zero mark for the assignment to failure of the unit. Identified instances of plagiarism WILL be documented on your academic record. Full details of penalties can be found at: [http://www.mq.edu.au/policy/docs/academic\\_honesty/schedule\\_penalties.html](http://www.mq.edu.au/policy/docs/academic_honesty/schedule_penalties.html)

### **Faculty Policy on assessment submission deadlines and late penalties**

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.

### **Unit-specific assessment information**

Late completion or submission of assessment tasks will not be accepted in this unit except for the Research report, where the Faculty policy (as above) will apply.

### **On-campus participation**

This unit aims to deliver hands-on practical experience in biology that requires on-campus attendance. Off-shore students must email the unit convenor as soon as possible to discuss study options.

## **Assessment Tasks**

Name	Weighting	Hurdle	Due
<u>Pre-practical Quizzes</u>	10%	No	Weekly prior to each practical class
<u>Mid-semester test</u>	15%	No	Week 7

Name	Weighting	Hurdle	Due
<u>Lab book</u>	5%	Yes	Weekly in each practical class
<u>Research Report</u>	30%	No	Week 9
<u>Final Exam</u>	40%	No	Formal examination period

## Pre-practical Quizzes

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

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

Due: **Weekly prior to each practical class**

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 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: **Week 7**

Weighting: **15%**

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

On successful completion you will be able to:

- Define evolution and describe its main mechanisms
- Define the 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

## Lab book

Assessment Type <sup>1</sup>: Participatory task

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

Due: **Weekly in each practical class**

Weighting: **5%**

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

Attendance at, and participation in, weekly practical classes is compulsory to pass this unit. You are also expected to keep a lab book, detailing the aims, methods, results and conclusion of your study. Teaching staff will sign the lab book at the end of each practical.

Please contact the first year teaching co-ordinator as soon as possible if you have difficulty attending and participating in any classes. There may be alternatives available to make up the work. If there are circumstances that mean you miss a class, you can apply for special consideration.

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

## Research Report

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

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

Due: **Week 9**

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 the marking rubric. Note that while you will work in a group to conduct the practical,

all written work is expected to be your own.

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: **Formal examination period**

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. 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 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

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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

This year, to remain COVID-safe, lectures will be pre-recorded. Two 1-hour lectures will be available via the unit's iLearn site each week. It is important for students to follow these lectures across the session because the material is closely linked to the otherwise compulsory practical classes and associated assessment tasks.

### Practicals

Practical classes last for up to 2 hours and will (mostly) be conducted on campus. Students are expected to attend and participate in these classes. **Failure to attend at least 80% of the practicals will result in a fail grade irrespective of the overall assessable mark for the unit.**

#### Internal students:

All practical classes will be conducted on-campus and with the following timetabled options:

1. Wednesday 9-11 am
2. Wednesday 11-1 pm
3. Wednesday 1-3 pm
4. Thursday 9-11 am
5. Thursday 11-1 pm
6. Thursday 1-3 pm
7. Friday 9–11am

Practical classes will be held across three adjoining science teaching laboratories at 6 Wallys Walk: a) 106 Science Lab, b) 110 Science Lab, c) 112 Science Lab. For reasons of personal safety, **fully enclosed footwear is mandatory for admission into these laboratories.**

Students that miss a practical class may be able to instead join a later internal session, or make up the absence by attending one of the external sessions. The option for doing so may however be limited and will be ultimately at the discretion of unit staff.

#### Practical schedule for external and OUA students:

Practical classes will be held in block sessions over four days. There are two streams. Students can select to attend either **Stream A** or **Stream B**:

**Stream A:** 26 March, 19-20 April, on-campus in 06WW106.

**Stream B:** 27 March, 21-22 April, on-campus in 06WW106.

Online-only delivery for part of these block sessions may be considered, depending upon circumstances, and if so would be duly advertised to students in advance.

## Unit Schedule

WEEK	TOPIC	Lecture schedule ( <i>Provisional</i> ):	STAFF
1	Welcome to Biology/BIOL1310	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	Species, speciation & phylogenies	9. The species concept/speciation	DK
	( <i>macroevolution</i> )	10. Phylogenies	DK
6	Cells, prokaryotes & eukaryotes	11. Cellular structure/function: pro/eukaryote	MG
		12. Bacterial evolution	MG
7	Unicellular & multicellular organisms	13. From unicellularity to multicellularity	MG
		14. Fungi	MG
8	Plants	15. Plants as living multicellular organisms	DK
		16. Diversity of plants	
9	Animals	17. The evolutionary history of animals	DK
		18. Diversity of animals (largely metazoa)	DK
10	Development, life history & reproduction	19. Development & life history	DK
		20. Reproduction	DK
11	Behaviour & plant/animal interactions	21. Animal & plant behaviour	DK
		22. Plant-animal interactions (& co-evolution)	DK
12	Ecology & Biogeography	23. Ecology I	DK
		24. Biogeography (animal & plant distributions)	DK
13	Pop, community & ecosystems ecology	25. Ecology II	

Staff: DK = A/Prof. Darrell Kemp; MG = Prof. Michael Gillings. Where not stated staffing will be announced.

## 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 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.

## Changes from Previous Offering

This year the unit will be convened by A/Prof Darrell Kemp and co-taught with Professor Michael

Gillings. Both are accomplished academics with speciality interests in evolution, genetics, whole-organismal biology, and biological diversity. The structure and intellectual basis of the unit will follow that of previous years, albeit with a different flavour of delivery, and an imperative for coherence.

## **COVID-19 and On-campus Teaching**

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 via iLearn.