BIOL2410

Ecology

Session 2, In person-scheduled-infrequent, North Ryde 2022

School of Natural Sciences

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General Information

Unit convenor and teaching staff
Unit Convenor
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14EaR 205
Mon-Thurs (note I do not work fridays)

Technician
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Credit points
10

Prerequisites
(50cp including [20cp from ((BIOL1310 or BIOL114) or (BIOL1110 or BIOL115) or BIOL121)] or [10cp from ((BIOL1310 or BIOL114) or (BIOL1110 or BIOL115) or BIOL121) and 10cp from (ENVE117 or (ENVS1017 or ENVS117) or GEOS117)] and [10cp from ((STAT1170 or STAT170) or (STAT1371 or STAT171) or FOSE1015)])

Corequisites

Co-badged status
BIOL6410

Unit description
Ecology is the study of the distribution and abundance of organisms and of the processes that generate these patterns. This unit covers basic ecological concepts at the level of organisms, populations, communities, and ecosystems. We study how interactions among organisms - and between organisms and their physical environment - shape the natural world. This unit also addresses how ecological concepts can be applied to current issues such as climate change, conservation, fisheries and agriculture. A first year Statistics unit is a prerequisite for this unit because we use both descriptive statistics and statistical tests to investigate community structure, population dynamics and how organisms interact with the environment. Many students find that the skills they gain taking BIOL2610 and or BIOL235 complements the skills needed in this Ecology unit.

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: Describe and analyse how interactions between organisms, and between organisms and the environment, influence population, community and ecosystem patterns

ULO2: Critically evaluate and compare ecological concepts and principles, and apply these to find solutions to contemporary environmental issues

ULO3: Carry out and correctly interpret a range of equations and statistical tests to measure characteristics of populations and communities

ULO4: Develop testable hypotheses to assess ecological patterns and processes, and design comparative experiments to test these

ULO5: Demonstrate knowledge of professional responsibility and safe working practices whilst undertaking field work

ULO6: Develop a scientific report to communicate a study you have undertaken, demonstrating appropriate linkages to scientific literature and ecological theory

General Assessment Information

NB: This unit cannot be completed online. All students must attend some face to face classes.

To pass this unit you must:

- Achieve at least 40% in the final exam, and attain an overall grade of 50% or more.

- Attend the compulsory fieldtrip.

Presentation (15%)

You will prepare a 6 minute presentation on a topic of your choosing, related to the application of ecology to real-world issues. The purpose of this is to demonstrate your understanding of how ecological concepts can be applied to understand and solve real-world problems, and your ability to communicate scientific issues to a lay audience. You will deliver your presentation in the week 4 and 5 labs (or, if you have enrolled in the infrequent attendance offering, the on-campus session). All students must upload Powerpoint slides to ilearn by **11:55 pm Fri 12 Aug**. Late submission of slides without approved Special Consideration will attract a penalty as per the assessment policy. A marking rubric is provided on iLearn.

Mid-semester test (25%)

There will be a mid-semester test held in Week 7. This will be 50 minutes in length, and will be an open book, online quiz that may cover all work from Weeks 1-7, including lectures, practicals and reading material. For weekday attendance students, this will run during the scheduled

lecture session on Wed 7 Sept. For infrequent attendance students, the test will be open on the evening of Wed 7 Sept, from 7-9 pm. Infrequent attendance students who cannot make this time are required to the convenor at email biol2410@mq.edu.au to make alternative arrangements. The tests will be multiple choice and will include numerical exercises similar to those taught in lectures. Questions will be randomly allocated to students. Note that if you are unwell and cannot undertake the test during your scheduled time, a special consideration will need to be submitted to organise a new time to sit the test.

Fieldtrip Practical Report (25%)

At the Stanwell Tops fieldtrip, you will undertake a group-based project. Students will individually write this up in the form of a scientific paper for submission to the journal Austral Ecology. The word limit for this report is 1500 words (excluding Abstract, Acknowledgement and References). Any text beyond 1500 words will not be read by the markers; shorter submissions are acceptable. Further details can be found in the Field Trip practical notes (on iLearn). A marking rubric is provided on iLearn, as well as a template for completing your report and examples of previous studies. This task is designed to assess your understanding of ecological concepts, limitations associated with fieldwork, how to source and utilise appropriate scientific literature to craft an argument, and scientific communication conventions.

Examination (35%)

The final exam will be held during the Semester 2 Exam Period and will be 2 hr (plus 10 min reading time). This will be an in-person, invigilated exam. Please consult the University Handbook to determine the commencement and finishing dates of the compulsory exam period. You will be permitted to take a non-programmable calculator and/or English language dictionary into the exam. Notes will not be permitted. While most of the material will focus on Weeks 8-13, some questions will also require knowledge of subject matter from Weeks 1-7.

The exam questions have been carefully written to test understanding, not rote learning:

- You will NOT be required to regurgitate definitions or the details of case studies we have discussed in class;
- You WILL need to be able to apply ecological principles to solve real-world problems.

Specifically, the exam (out of 70) will be comprised of three sections, and it is recommended you spend ~40 min on each:

(A) a multiple choice section where you will be asked to interpret figures and tables and synthesise information (20 questions, 1 mark each; to give 20 possible marks);

(B) a short answer section where you will be asked to solve problems by integrating ecological concepts you have learnt during the course (6 questions, 5 marks each, to give 30 possible marks);

(C) longer response questions where you will use your ecological knowledge to address an applied (conservation or management) problem (2 questions, 10 marks each, to give 20 possible marks)

Note that there are also four non-assessed practical quizzes that must be done before

undertaking practicals. These are to ensure that students are properly prepared for these.

Assignment submission

The Powerpoint slides for the oral presentation are to be uploaded to iLearn via the assignment submission box and the Practical Report via the TURNITIN link by 11:55 pm on the due date. TURNITIN is a powerful online tool for the detection of plagiarism. It works by comparing the text of a submitted document (i.e., your assignment) with the work of your current classmates, past students in Ecology and other courses at Macquarie, as well as published material in books, journals and on the web.

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following university standard late penalty applied. Please see https://students.mq.edu.au/study/assessment-exams/assessments for more information.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written 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. Submission time for all written assessments is set at **11:55 pm**. A 1-hour grace period is 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, students need to submit an application for Special Consideration.

Assessment Tasks

Name	Weighting	Hurdle	Due
Oral-based presentation	15%	No	slides due 12/08/2022; presentations 13-14/08/2022
Mid-semester test	25%	No	7/09/2022
Practical Report	25%	No	23/10/2022
Final Exam	35%	Yes	End of semester exam period

Oral-based presentation

Assessment Type [1]: Presentation
Indicative Time on Task [2]: 10 hours
Due: **slides due 12/08/2022; presentations 13-14/08/2022**
Weighting: **15%**

You will give a short presentation on a key topic in ecology

On successful completion you will be able to:

- Describe and analyse how interactions between organisms, and between organisms and the environment, influence population, community and ecosystem patterns
- Critically evaluate and compare ecological concepts and principles, and apply these to find solutions to contemporary environmental issues

Mid-semester test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 15 hours
Due: **7/09/2022**
Weighting: **25%**

There will be an online quiz. The questions may be based on lectures, reading materials and practicals, and will test your knowledge of ecological concepts and your understanding of equations used in different subfields of ecology.

On successful completion you will be able to:

- Describe and analyse how interactions between organisms, and between organisms and the environment, influence population, community and ecosystem patterns
- Carry out and correctly interpret a range of equations and statistical tests to measure characteristics of populations and communities
- Demonstrate knowledge of professional responsibility and safe working practices whilst undertaking field work

Practical Report

Assessment Type [1]: Practice-based task
Indicative Time on Task [2]: 15 hours
Due: **23/10/2022**
Weighting: **25%**

You will write a scientific report, in the format of a paper for the journal Austral Ecology, describing one of the practical experiments, and discussing principles of fieldwork. The report will be uploaded to Turnitin.

On successful completion you will be able to:

- Describe and analyse how interactions between organisms, and between organisms and the environment, influence population, community and ecosystem patterns
- Carry out and correctly interpret a range of equations and statistical tests to measure characteristics of populations and communities
- Develop testable hypotheses to assess ecological patterns and processes, and design comparative experiments to test these
- Demonstrate knowledge of professional responsibility and safe working practices whilst undertaking field work
- Develop a scientific report to communicate a study you have undertaken, demonstrating appropriate linkages to scientific literature and ecological theory

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 25 hours
Due: **End of semester exam period**
Weighting: **35%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

The final exam will be held during the Semester 2 Exam Period. Please consult the University Handbook to determine the commencement and finishing dates of the compulsory exam period. This exam will assess your understanding and interpretation of ecological patterns, processes and concepts, and your ability to use these to suggest solutions to contemporary environmental issues

On successful completion you will be able to:

- Describe and analyse how interactions between organisms, and between organisms and the environment, influence population, community and ecosystem patterns
- Critically evaluate and compare ecological concepts and principles, and apply these to find solutions to contemporary environmental issues
- Carry out and correctly interpret a range of equations and statistical tests to measure characteristics of populations and communities
- Develop testable hypotheses to assess ecological patterns and processes, and design

comparative experiments to test these
- Demonstrate knowledge of professional responsibility and safe working practices whilst undertaking field work
- Develop a scientific report to communicate a study you have undertaken, demonstrating appropriate linkages to scientific literature and ecological theory

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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

The unit consists of 2 lectures per week (available to infrequent attendance students via Echo360) and either

- a 3 hour practical per week (weeks 2-7) for weekday attendance students *or*
- a weekend on-campus session for those nominating infrequent attendance

There is a **compulsory** field trip to Stanwell Tops in the September mid-semester break that **all** students enrolled in this unit must attend. **Students who cannot attend the fieldtrip should NOT enrol in this unit.**

- *Lectures:* Mon 0900 (23WW Price Theatre) AND Wed 1100 (21WW Macquarie Theatre)
- *Practicals (compulsory for weekday attendance students):* Mon 1000-1300, Mon 1400-1700, OR Tues 1000-1300 (**weeks 2-7** only; 14EaR)
- *On campus session (compulsory for infrequent attendance students):* 13-14 August (0900-1700)
- *Field trip (compulsory for ALL students):* **A:** 19-21 September OR **B:** 21-23 September

Required and recommended texts and/or materials

There is no prescribed text book for this course. Instead, I have compiled a collection of materials (papers, videos, websites) that directly complement the lectures. These are available via the iLearn site for this unit. It is expected that you review these materials before coming to each lecture.

If you would also like to consult a textbook (this is not compulsory), I suggest:

Begon M, Howarth RW, Townsend CR (2014) Essentials of Ecology. 4th edition. Blackwell Scientific Publications, Cambridge. The 3rd (2008) edition is also acceptable, if you can come by

it second hand.

Unit web page

PowerPoint slides, lecture recordings, unit readings, copies of all unit hand-outs and helpful resources for completion of assessments will be available through iLearn. Consequently, it is strongly recommended that you interact with the BIOL2410/6410 online unit regularly. **To access the online unit, go to https://iLearn.mq.edu.au/login/MQ/ and type in your Macquarie OneID Username and password.**

New to iLearn? You can find out more at: https://students.mq.edu.au/support/technology/systems/ilearn

Experiencing difficulties? contact the IT Service Desk at help@mq.edu.au.

Unit Schedule

Lecture timetable

Part 1. Organisms and their environment

WEEK 1

25th July	1. An introduction to ecology
27th July	2. Conditions, resources and the niche concept

WEEK 2

1st August	3. Distributions
3rd August	4. Global patterns of productivity

WEEK 3

8th August	5. Ecological strategies and their evolution
10th August	6. Population growth and intraspecific competition

Part 2. Interactions among species

WEEK 4

15th August	7. Interspecific competition
17th August	8. Predation and herbivory

WEEK 5

22nd August	9. Parasitism and disease
24th August	10. Facilitation and mutualism

Part 4. Communities and ecosystems

WEEK 6

29th August 11. Community structure

31st August 12. Community function

WEEK 7

5th September 13. Preparing for the field trip

7th September MID SEMESTER TEST

MID SEMESTER BREAK

WEEK 8

26th September 14. Disturbance and succession

28th September 15. Island biogeography

WEEK 9

3rd October PUBLIC HOLIDAY – NO LECTURE

5th October 16. The flux of energy through food webs

WEEK 10

10th October 17. The flux of matter through food webs

12th October 18. Spatial subsidies

5. Applied ecological issues

WEEK 11

17th October 19. Global change biology

19th October 20. Ecological impacts and their assessment

WEEK 12

24th October 21. Invasive species and their management

26th October 22. Restoration and reconciliation ecology

WEEK 13

31st October 23. Managed ecosystems: fisheries and forestry

2nd November 24. Exam discussion, revision, 300-level unit information

Practical classes

For all practical sessions (including Oral Presentations in weeks 4 and 5) you must be wearing covered shoes to be allowed entry to the labs and there is strictly no eating or drinking.

Timetable for weekday attendance students (infrequent attendance students will do these during

the co-campus session on 13-14 August)

Week 2	25-26 July	No prac
Week 2	1-2 August	Practical induction/censusing deep sea life
Week 3	8-9 August	Carbon accounting **(fieldwork)**
Week 4	15-16 August	Oral presentations 1
Week 5	22-23 August	Oral presentations 2
Week 6 **(fieldwork)**	29-30 August	Herbivory and enemy release hypothesis
Week 7	5-7 September	Species richness **(fieldwork)**

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 ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.