



BIOL227

Ecology

S2 Day 2017

Dept of Biological Sciences

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Disclaimer

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General Information

Unit convenor and teaching staff

Caitlin Kordis

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Katherine McClellan

katherine.mcclellan@mq.edu.au

Credit points

3

Prerequisites

(15cp including [6cp from (BIOL114 or BIOL115 or BIOL116 or BIOL121)] or [3cp from (BIOL114 or BIOL115 or BIOL116 or BIOL121) and 3cp from (ENVE117 or ENVS117 or GEOS117)] and [3cp from (STAT170 or STAT171)])

Corequisites

Co-badged status

BIOL601

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. There is a compulsory field trip for all students in the mid-semester lecture break and a two day on-campus practical session for external students over a weekend early in the session. STAT170 (or STAT171) 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 BIOL235 compliments 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:

1. Explain how organisms interact with each other and with the environment.
2. Analyse how these interactions influence patterns of distribution and abundance.
3. Analyse the structure of and changes in populations, communities, and ecosystems.
4. Apply ecological concepts to novel situations, especially to contemporary issues.
5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
6. Identify and synthesise important ecological principles.
7. Develop questions and pose hypotheses about ecological patterns and processes.
8. Collect and analyse ecological data in order to evaluate hypotheses.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Fortnightly quiz</u>	10%	No	Fortnightly
<u>Pre-prac quiz</u>	5%	No	Weeks 3 and 4
<u>Ecology Reserve Prac Report</u>	20%	No	06/09/17 Week 6
<u>Field Trip Report</u>	25%	No	15/10/17 Week 9
<u>Examination</u>	40%	No	Exam period

Fortnightly quiz

Due: **Fortnightly**

Weighting: **10%**

Over the course of the semester there will be five online quizzes for each student to complete. These will be multiple choice, with each quiz worth 2% of your total grade. The quizzes will be based on the lecture material and recommended readings for the lectures preceding the quiz, and are designed to help you keep up with lecture material and identify where you need help or clarification. It is best to complete the quiz the week you receive it, however each quiz will be open for two weeks therefore no extensions will be given unless Central Admin has approved a Serious Disruptions to Studies Through Misadventure Certificate. Quizzes will open on Wednesdays. As questions will be randomly selected from an available pool, it is likely that students will receive different questions to one another.

On successful completion you will be able to:

- 1. Explain how organisms interact with each other and with the environment.
- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 3. Analyse the structure of and changes in populations, communities, and ecosystems.

- 4. Apply ecological concepts to novel situations, especially to contemporary issues.

Pre-prac quiz

Due: **Weeks 3 and 4**

Weighting: **5%**

Pre-prac quizzes will involve reading material, thinking about hypotheses to be tested and experimental designs. The purpose of this is to provide you with appropriate background to undertake the prac, so we can “get stuck in” straight away. You should be expected to spend approximately 1.5 hours on this activity, prior to the pracs for Weeks 3 and 4. Note that your first written assessment will be based on one of these two fieldwork activities.

On successful completion you will be able to:

- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 6. Identify and synthesise important ecological principles.
- 7. Develop questions and pose hypotheses about ecological patterns and processes.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Ecology Reserve Prac Report

Due: **06/09/17 Week 6**

Weighting: **20%**

One of two class pracs conducted in the Macquarie University Ecology Reserve will be written up as an individual report. The report (max 1000 words **excluding Abstract, Acknowledgements and References**) is to be in the style of the journal *Austral Ecology*. The journal has strict formatting instructions that must be followed throughout. These can be found at the bottom of the instructions for authors, on the journal web-site: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1442-9993/homepage/ForAuthors.html](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1442-9993/homepage/ForAuthors.html)

Specifics on the marking scheme and formatting can be found on iLearn. This activity should require 14 hours of work.

On successful completion you will be able to:

- 1. Explain how organisms interact with each other and with the environment.
- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 3. Analyse the structure of and changes in populations, communities, and ecosystems.
- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 6. Identify and synthesise important ecological principles.

- 7. Develop questions and pose hypotheses about ecological patterns and processes.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Field Trip Report

Due: **15/10/17 Week 9**

Weighting: **25%**

The second report will communicate the results of the independent research project conducted on the Stanwell Tops field trip. The word-limit for this second report, which will also be formatted as an *Austral Ecology* manuscript, is 1500 words (**again excluding Abstract, Acknowledgements and References**). Further details can be found in the Field Trip practical notes (which will be posted on iLearn). This activity should require 28 hours of work.

On successful completion you will be able to:

- 1. Explain how organisms interact with each other and with the environment.
- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 3. Analyse the structure of and changes in populations, communities, and ecosystems.
- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 6. Identify and synthesise important ecological principles.
- 7. Develop questions and pose hypotheses about ecological patterns and processes.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Examination

Due: **Exam period**

Weighting: **40%**

The final exam (worth 40% of your mark) will be held during the Semester 2 Exam Period and will be 2 hr (plus 10 min reading time). 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.

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.

On successful completion you will be able to:

- 1. Explain how organisms interact with each other and with the environment.
- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 3. Analyse the structure of and changes in populations, communities, and ecosystems.
- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 7. Develop questions and pose hypotheses about ecological patterns and processes.

Delivery and Resources

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

- a 3 hour practical per week (weeks 2-5) for internal students *or*
- a weekend on-campus session for externals (19th & 20th August)

There is a **compulsory** field trip to Stanwell Tops in the September vacation that **all** students enrolled in this unit must attend (25-27 September OR 27-29 September). This is a hurdle assessment, i.e. students must attend the field trip, participate in all activities and submit the associated written assessment to pass this unit.

Students who cannot attend the fieldtrip should NOT enrol in this unit.

While there is a text book that some lectures will follow, you do not need to purchase this as a copy will be in special reserve and online:

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 Schedule

Week	Date	Lecture	Topic	Lecturer
<i>Part 1. Ecological Methods and Organisms and their environment</i>				
1	1 Aug	1	Ecology: what is it and how is it done?	LB
	2 Aug	2	Conditions, resources and the niche concept	LB
2	8 Aug	3	Distributions	LB
	9 Aug	4	An introduction to ecological field sampling	KM

3	15 Aug	5	Global patterns of productivity	LB
	16 Aug	6	Effects of environment on life history	LB
<i>Part 3: Communities and ecosystems</i>				
4	22 Aug	7	Describing community structure: diversity and species richness	LB
	23 Aug	8	The more the merrier: why biodiversity matters	KM
<i>Part 2: Interactions among species</i>				
5	29 Aug	9	Population growth and intraspecific competition	LB
	30 Aug	10	Interspecific competition	LB
6	5 Sept	11	Predation	LB
	6 Sept	12	Parasitism and disease	LB
7	12 Sept	13	Facilitation	KM
	13 Sept	14	Stanwell Tops: Introduction to Field Trip	KM
<i>Semester Break & Stanwell Tops Field Trip</i>				
8	3 Oct	15	Processes influencing community structure: disturbance and succession	KM
	4 Oct	16	Processes influencing community structure: island biogeography	KM
9	10 Oct	17	The flux of energy through food webs i	KM
	11 Oct	18	The flux of energy through food webs ii	KM
10	17 Oct	19	Spatial subsidies: another time, another place	KM
<i>Part 4. Applied ecological issues</i>				
	18 Oct	20	Ecological impact assessment	KM
11	24 Oct	21	Restoration ecology	KM
	25 Oct	22	Invasive species and their management	KM
12	31 Oct	23	Managed ecosystems: agriculture, fisheries and forestry	KM

	1 Nov	24	Global climate change	LB
13	7 Nov	25	Exam discussion, revision, 300-level unit information	LB & KM
	8 Nov	26	No lecture – personal study for the exam	

LB: Dr Linda Beaumont

KM: Dr Katherine McClellan

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, 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.

Student Support

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

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

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.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 7. Develop questions and pose hypotheses about ecological patterns and processes.

Assessment tasks

- Pre-prac quiz
- Examination

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcome

- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.

Assessment task

- Pre-prac quiz

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- 1. Explain how organisms interact with each other and with the environment.
- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 3. Analyse the structure of and changes in populations, communities, and ecosystems.
- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 6. Identify and synthesise important ecological principles.
- 7. Develop questions and pose hypotheses about ecological patterns and processes.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Assessment tasks

- Fortnightly quiz
- Pre-prac quiz

- Ecology Reserve Prac Report
- Field Trip Report
- Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

1. Explain how organisms interact with each other and with the environment.
2. Analyse how these interactions influence patterns of distribution and abundance.
3. Analyse the structure of and changes in populations, communities, and ecosystems.
4. Apply ecological concepts to novel situations, especially to contemporary issues.
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7. Develop questions and pose hypotheses about ecological patterns and processes.
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Assessment tasks

- Fortnightly quiz
- Pre-prac quiz
- Ecology Reserve Prac Report
- Field Trip Report
- Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- 2. Analyse how these interactions influence patterns of distribution and abundance.
- 3. Analyse the structure of and changes in populations, communities, and ecosystems.
- 4. Apply ecological concepts to novel situations, especially to contemporary issues.
- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 6. Identify and synthesise important ecological principles.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Assessment tasks

- Fortnightly quiz
- Pre-prac quiz
- Ecology Reserve Prac Report
- Field Trip Report
- Examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- 5. Identify appropriate scientific journal articles, and critically evaluate and synthesise key concepts and conclusions.
- 7. Develop questions and pose hypotheses about ecological patterns and processes.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Assessment tasks

- Ecology Reserve Prac Report
- Field Trip Report
- Examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with

knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- 6. Identify and synthesise important ecological principles.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Assessment task

- Examination

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- 6. Identify and synthesise important ecological principles.
- 8. Collect and analyse ecological data in order to evaluate hypotheses.

Assessment tasks

- Ecology Reserve Prac Report
- Field Trip Report
- Examination

Changes from Previous Offering

- Assessments: The peer review component of the prac report assessment has been removed.
- The field trip will take place at The Tops Conference Centre, Stanwell Tops.
- Sign-up for the field trip is fully online. Please register through eStudent. **Details of how to pay for the fieldtrip will be provided in the first practical (for internal students) or by email (for external students) and on iLearn.**
- The turnitin plagiarism check for the written assessments will be available through iLearn
- There will be five fortnightly quizzes that students must undertake online. These are designed to encourage problem-solving skills, reinforce lecture material and ensure students remain up-to-date.

Changes since First Published

Date	Description
21/06/2017	The date of the external on-campus session is 19-20 August. Dates for the compulsory Fieldtrip are 25-27 September OR 27-29 September.