

PLANT ECOLOGY

Course information



Angela Moles and Stephen Bonser

2019

Table of Contents

Discussion group instructions	3
Discussion group marking schedule	4
Quizzes on readings.	5
Kioloa field trip information.....	6
Introduction	6
Occupational Health and Safety	6
Food and Accommodation:	6
What to bring	7
Getting to Kioloa	8
Field trip schedule	10
Independent Research Project.....	11
Marking schedule for research project write-up.....	13



Discussion group instructions

Student led discussion groups will take place on Mondays between 30 September and 18 November. We will have two discussions per week (45 minutes each), separated by a 10 minute break. Each group will tackle current controversies in research areas highlighted in our discussion group topics. Groups leading a discussion will not be expected to do 45 minute long presentation on the topic, rather you will facilitate a discussion among class members.

The aim of the discussion group is to give you experience of synthesising information and ideas from the current ecological literature, presenting this information in an engaging manner, and facilitating a class discussion.

All students are expected to read the posted reading for each discussion group question and take part in the discussion. There will be a short quiz on each paper at the start of each student led discussion class, and three of these will be assessed.

Topics

We have provided a list of topics and associated readings (available on Moodle). On the first day of class, you will be able to choose a topic. Not everybody will be able to have their first choice of topic. To ensure fairness, we will be using random number tables to order student names, and will offer first choice to the first names on the list. We would also be very happy to discuss alternative ideas for topics.

Group size

You will work in groups of 3 or 4.

Assessment

Your discussion group grade makes up 25% of your grade for Plant Ecology.

Discussion group marking schedule

Assessment criteria – Discussion group	Possible mark	Your mark
Presentation <ul style="list-style-type: none"> - Quality of slides/presentation (clear content, not too much text per slide, nice clear large text on plain backgrounds, no unnecessary animations/irrelevant pictures, no spelling mistakes/grammar problems) - Engaging, clearly presented oral presentation (didn't read from slides/notes, audible at back of room, sounded interested in the content) 	15	
Depth of understanding of literature <ul style="list-style-type: none"> - Shows evidence of having read and understood the example readings and other key readings in the field - Synthesised information from a wide range of sources (ie didn't just report what each paper said, but integrated information and ideas from multiple papers to provide a cohesive picture of the field). - Identified the big questions and critically evaluated major trends/patterns and controversies in the field - Shows evidence of independent critical thought and own ideas about topic (e.g. uses evidence and logic to decide which side of a debate/controversy seems most likely to be correct). - Identifies likely productive future directions 	65	
Facilitated class discussion <ul style="list-style-type: none"> - Made sure classmates contributed to discussion - Managed discussion so that it wasn't dominated by a few people - Made sure quieter members of class got a chance to contribute - Responded appropriately to people's ideas/suggestions - Generally ran an interesting and engaging discussion. 	20	
TOTAL	100	

Quizzes on readings.

We expect you to have read the allocated paper for each research topic (the one in bold font on the list of discussion topics) before class (that is, you need to read two papers for each week of student-led discussions). Doing these readings is essential to your ability to participate in a meaningful way in class discussions, so we have small quizzes to make sure everyone has done the readings, and to reinforce your understanding of the concepts presented in the papers.

We will do a quiz at the start of each class. The quizzes will be graded and returned in class the following week.

The marks from your quizzes will make up 20% of your total grade for the course.

Kioloa field trip information

11th to 15th October, 2019

Introduction

Kioloa is an ANU field station between Ulladulla and Bateman's Bay <http://kioloa.anu.edu.au/>. The purpose of the field trip to Kioloa is to give you first-hand experience with plant ecology in the field.

On the field trip you will undertake independent research projects, culminating in group seminars on the final afternoon/evening of the trip. The data you gather at Kioloa will form the basis for your major written assignment for Plant Ecology. You will also have a chance to explore a range of habitat types, go spotlighting with Frank Hemmings, and hear research seminars from staff and/or postgraduate students.

Occupational Health and Safety

1. You must hand in a 'Fieldwork Medical Questionnaire' in the prac class before we leave for the trip.
2. You are responsible for your own transport to/from Kioloa. Dinner is not provided on the first night, so either take something with you, or buy something on the road.
3. Your projects must fall within reasonable safety standards. If staff do not approve of the level of risk in your project, you will be politely asked to think of something different.
4. There are serious rips at the beach. Do not swim alone, know how to spot a rip, and know what to do if you do find yourself in a rip. Alcohol and fires are both banned on the beach. There is a firepit at the station for campfires.

Food and Accommodation:

You will be accommodated in a dormitory with comfortable bunks, heating and hot and cold running water. Cooking will be led by Frank Hemmings, but you will need to help out (groups will be assigned tasks/days). All basic food and drink will be provided. If you want junk food or any other extras (including moderate amounts of alcohol), bring it with you. Smoking is prohibited inside any of the buildings.

Station Address: 496 Murramarang Road, KIOLOA NSW 2539; Phone +61 2 4457 1118

What to bring

1. Bedding (bottom sheet, pillowslip and sleeping bag or doona). Pillows and mattresses are provided in the dormitory. You must bring a sheet and pillowcase, even if you are using a sleeping bag. If you arrive without these things, you will be asked to rent them from the limited supply available at Kioloa (fees apply).
2. Toiletries - towel, soap, toothbrush, toothpaste, etc
3. Any medication you might need.
4. Clothing for warm and chilly weather, including long pants to wear in the field and wet weather gear (at least a raincoat, just in case). Don't forget your PJs.
5. Sun protection, including a sunhat, sunscreen, sunglasses and long sleeved shirts for bright hot days in the field.
6. Insect repellent.
7. Sturdy, comfortable walking shoes or boots for field work.
8. Swimwear (optional)
9. Binoculars and/or camera (optional).
10. Materials for recording data and writing notes (e.g. a notebook or paper, a calculator, pens/pencils, a ruler, an eraser, etc).
11. Please bring a laptop/tablet, if you have one.

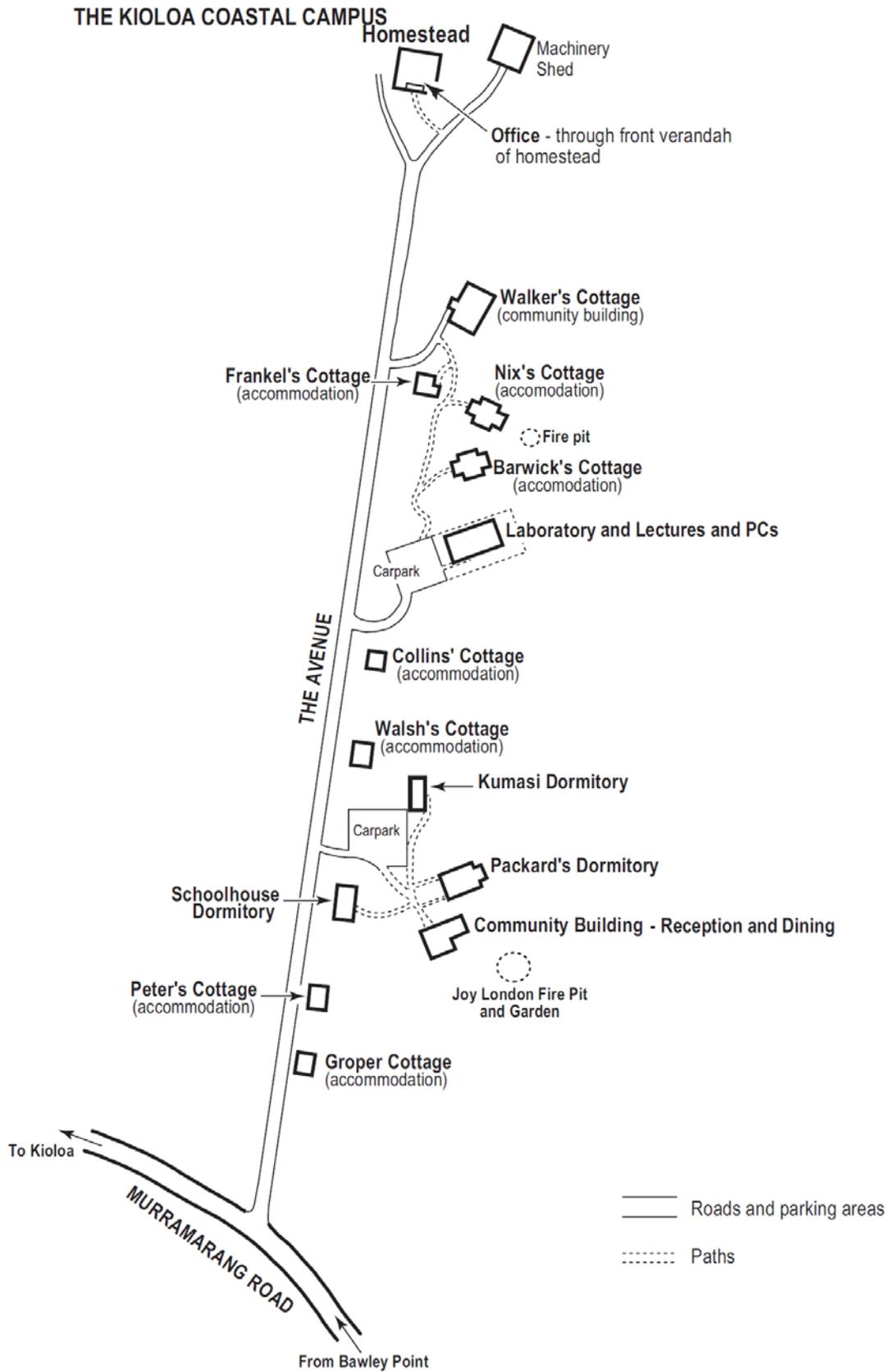
Getting to Kioloa

You are responsible for your own transport to/from Kioloa, and for bringing all the equipment and personal clothing etc that you need for the trip and research project. Dinner is not provided on the first night, so we suggest you either take some food with you, or buy something along the way (which will also give you a nice driving break for safety!).

There is very limited public transport to Kioloa – we recommend carpooling. You will have the opportunity to form groups for carpooling during the prac classes before the trip.

To get to Kioloa, head south out of Sydney on state highway one. Continue south until you reach Ulladulla. Turn off to Kioloa at Termeil. The station is at 496 Murramarang Road, Kioloa.





Field trip schedule

FRIDAY 11th October

- Travel to Kioloa (transport and dinner are to be self-arranged).

SATURDAY 12th October

- Welcome talk
- Begin independent research projects
- Evening: Presentation by Angela Moles

SUNDAY 13th October

- Continue data collection for research projects
- Optional spotlighting and stars walk (weather dependent)

MONDAY 14th October

- Continue data collection for research projects
- Evening: Presentation by Angela Moles

TUESDAY 15th October

- Morning: continue work on independent projects
- 3pm: presentations of independent research projects begin
- Clean up, packing. Vacate dorms, return sampling equipment
- Travel back to Sydney (transport and dinner to be self-arranged).

Independent Research Project

The aim of this project is to give you experience of designing and carrying out your own research project, and to give you more first-hand experience of plant ecological field work.

Group size

Work in groups of 5 (some groups may have to have 4, depending on how many enrolments we have). Form your own group.

What sort of thing can you do?

You may work on virtually any aspect of plant ecology. Find something that inspires you! There will not be a list of projects to choose from - you will be expected to come up with your own idea (coming up with excellent, interesting ideas is one of the most important parts of being a good scientist – and besides, it's more fun if you're working on something that you really care about).

Equipment

You will need to provide us with a list of the equipment you need us to provide for your field work (tape measures, metre rules, plastic bags etc) by the prac class two weeks before the trip runs. If your project idea requires specialised equipment, come and talk to us as early as possible and we will see if we can find it for you (of course, our resources are not unlimited!). You will be given your equipment in the prac class the week before the trip runs, and will be expected to bring it on the trip with you. You will return the equipment on the last day of the trip.

Scope of project

You will have four days in the field to collect data, enter data, do some preliminary analyses and make a presentation for the class. So, you need to be realistic about how much you can get done. It is better to tackle a small project well than to do a bad job of something ridiculously big. If you do an excellent job of a manageable, interesting question, you might even be able to publish your work in a scientific journal. Make sure you use your time in the field well – we will not be terribly impressed if you collect some data in one afternoon and spend the rest of your time at the beach!

<p>Your project must fall within reasonable safety standards. If staff do not approve of the level of risk in your project, you will be politely asked to think of something different.</p>
--

ALTERNATIVE ASSIGNMENT

IF your data collection fails terribly, or if you have a serious personal disaster that prevents you from coming on the field trip (note, the trip is not optional!), you may ask permission to do an alternative, literature based project for your write up.

We would like you to come up with a hypothesis, and gather data from the literature to assess whether the hypothesis is supported by the available data. The topic can be anything you chose, EXCEPT the topic you covered for your in-class presentation. It is also best to avoid topics that have had recent meta-analyses performed on them.

We are looking for more than a literature review here – we actually want you to synthesise data from a range of papers, perform statistical analyses, generate figures etc. Your data collection can be in the form of a) counting the number of studies that provide evidence in support of/against a hypothesis, or b) combining data from a range of papers/books to provide a test of an idea (e.g. compiling data on dispersal distances and plant heights for a range of species and asking if taller plants tend to disperse seeds further). We appreciate that this if a

form of data collection you may not have encountered before, and are happy to help you with the direction of this project.

Instructions for this alternative assignment are the same as for the field project (word limits, format requirements, assessment criteria etc).

THE WRITE-UP

Present your research as a scientific paper, formatted for the *Journal of Ecology*. This is an independent write up – the group work ends at the end of the field trip. You are responsible for your own data analyses, graph preparation and writing.

Your paper should not exceed 2500 words in length (not including the references), plus a 350 word abstract (that is, a **total of 2850 words, plus references**). Follow the *Journal of Ecology* author guidelines as if you were going to submit the paper. You will find these at: <http://www.journalofecology.org/view/0/authorGuideline.html>, and we have put a copy up on Moodle. Include a **word count**, or we will assume that your essay is too long. Please **double-space** your assignment, and use a **12 point font** with reasonable margins.

Citing relevant literature

You need to read and cite *at least* 10 (preferably more) different scientific papers on your topic. Make sure that your sources are from peer-reviewed scientific journals, or scientific books. The best place to find these papers is ISI Web of Science (Google scholar is great too, but not everything that pops up there has been peer reviewed). Come and talk Angela, Stephen or Flo if you do not know how to search Web of Science for relevant papers. References to websites such as Wikipedia are unacceptable in a scientific paper.

Plagiarism: Don't do it! You can find details of university plagiarism policy in the course information sheets (on Moodle) and on the university website.

Beware: your markers have been known to get grumpy when species names are incorrectly formatted or misspelled, when quadrats are called quadrants, when figures have been done in excel, don't have appropriate axis titles with units and/or look exactly the same as the rest of your group's figures, and when you forget to follow the Journal of Ecology instructions!!

Critical thinking: We look for evidence of critical thinking in your write-ups. Critical thought is not the same as being critical. Saying "I hated this paper, it was too long and boring" is NOT critical thought. Critical thought means thinking deeply about the content of the paper, and relating it to other things you know. Some examples:

"I disagreed with the conclusion of this paper, as their results were equally consistent with X theory (Blogs 1978), which is also supported by data from X, Y and Z",

"This study was fundamentally flawed, as the experimental units were pseudoreplicated. From the comparison the authors did, one can conclude X, but not Y".

"The authors' findings have relevance beyond the field of plant-herbivore interactions. If similar interactions were observed in plant-pollinator interactions, then this would disprove Blogs' theory (1978)".

Marking schedule for research project write-up

(45% of course grade)

Name

Assessment criteria	Possible mark	Your mark
<p>Innovative idea and sound experimental design/data collection Contributed to development of idea and experimental design (in the labs and in the field). Worked hard and did your best to gather good-quality data. Worked well as part of a team.</p>	15	
<p>Excellent presentation of data Appropriate choice of graph styles and statistics. Tables/appendices used appropriately, or not at all. Figures nicely presented (no excel default graphs!) with appropriate labels, legends, units etc. Results section written appropriately.</p>	20	
<p>Appropriate interpretation of results Uses the results (including the statistics) to draw valid, interesting and reasonable conclusions from the data. Does not make conclusions beyond the scope of the data. <i>If</i> there were major problems with the data collection, explains how these could be avoided next time.</p>	15	
<p>Synthesises ideas/information from a wide range of sources, and shows evidence of critical thought</p> <ul style="list-style-type: none"> Shows evidence of independent, critical scientific thought. This can be done through original insights, your own novel ideas and clear arguments explaining your position on a topic. Cites (and shows evidence of having read and understood) at least 10 papers (preferably more), and shows how results fit with previous knowledge in the field, and synthesises information/ideas from different papers (ie, don't just tell us what a paper said – put the information together with what other authors have said and what you found, and show that you have thought about how the combined evidence supports/goes against a scientific idea or viewpoint). 	30	
<p>Good scientific writing/presentation</p> <ul style="list-style-type: none"> Good abstract (summarises the main ideas/conclusions of the paper, while making the reader want to know the full story, < 350 words). Logical structure, appropriate form for a paper in <i>J. Ecology</i>. Written in concise, grammatically correct sentences without spelling or punctuation mistakes, and with appropriate use of paragraphs. Written in an engaging style that holds the reader's interest. Statements backed up with appropriate references (in an appropriate form) throughout the text. Appropriate length (marks will be deducted for over-long assignments, or for failing to disclose the word count). Reference list presented in a style appropriate for <i>J. Ecology</i>. 	20	
TOTAL	100	



UNSW
SYDNEY

Course Outline



BIOS3061
PLANT ECOLOGY

School of BEES

Faculty of Science

T3, 2019

1. Staff

Position	Name	Email	Consultation times and locations	Contact Details
Course Convenor	Prof Angela Moles	a.moles@unsw.edu.au	By appointment	D26 Room 401e Phone 9385 3802
Lecturer & facilitator	A/Prof Stephen Bonser	s.bonser@unsw.edu.au	By appointment	D26 Room 401a, Phone 9385 3863

2. Course information

Units of credit: 6UOCNSW

Pre-requisite: BIOS 2011

Teaching times and locations:

Component	HPW	Time	Day	Location
<i>Face-to-face class time (including discussion groups, open labs and lectures – see section 4 for details)</i>	4	12-2pm	Monday (weeks 1-3, 6-11)	Morven Brown G3
		3-5pm	Thursday (weeks 1-4, 6-10)	Mathews 105
<i>Field trip</i>	5 days		11-15 Oct	Kioloa

2.1 Course summary

This course is not lecture based – rather, weekly meetings will be based on discussions facilitated and led by both lecturers and students. Discussion topics are selected by the students, so vary from year to year, but include: plant-animal interactions, including herbivory, seed dispersal and pollination; biological invasions; disturbance, including life in fire-prone ecosystems and the effects of human influences on plant communities; plant regeneration, including reproduction and mating systems, and seed and seedling ecology; evolutionary radiations; plant ecological strategies. We incorporate evolutionary, population and community approaches to plant ecology, and include examples from Australia, and around the world.

A five-day field excursion during week 5 is compulsory and will involve expense to individual students.

2.2 Course aims

The course is designed to explore current research areas in the ecology and evolution of plants

2.3 Course learning outcomes (CLO)

Students taking this course will explore current research in plant ecology. You will learn to:

- 1) Think critically about research and plant ecology.
- 2) Find, read and interpret the primary plant ecology literature.
- 3) Identify directions of important research in plant ecology.
- 4) Conduct research, including having the initial idea, designing the data collection protocol, collecting data in the field, statistical analysis of data, and presenting findings in the form of a scientific paper.
- 5) Communicate science in written and oral formats.

3. Strategies and approaches to learning

3.1 Learning and teaching activities

Learning and teaching in plant ecology will focus on student driven research. Weekly discussion groups will be primarily led by students. Further, students will undertake independent research projects in a field trip.

Discussion groups will require students to engage in current research in plant ecology. Students will work with the course academics to select topics and appropriate readings to post for the class.

Independent research projects will be conducted during the field trip. Open labs before the field trip will provide students extra support in developing research ideas prior to the trip. Similarly, open labs after the field trip will provide students support in analysis and interpretation of their field data.

Students will be assessed on their discussion groups, an independent research report, an end of session test, and regular quizzes on readings. These assessments are designed to promote progress in research, an understanding of current plant ecological research, and to build a foundation of skills associated with being a research scientist.

We treat students as intelligent adults who can make their own decisions and drive their own learning experience. We have therefore done away with traditional lectures and practical work in favour of student led discussions and research. We provide support and guidance where needed, but try not to be heavy-handed or prescriptive.

3.2 Expectations of students

Class attendance is required. Since this subject is not offered in distance mode, student participation in discussion groups and in the field trip is essential. Any alterations to the schedule will be announced in a preceding class. Students whose attendance at classes or assessment is affected by obligatory religious ceremonies or other commitments (representing the university, military service etc.) should discuss ways of dealing with this clash with Prof. Moles prior to, or at the commencement of the course.

We treat students as intelligent adults who can make their own decisions and drive their own learning experience. We have therefore done away with traditional lectures and practical work in favour of student led discussions and research. We provide support and guidance where needed, but try not to be heavy-handed or prescriptive.

4. Course schedule and structure

This course consists of 4 hours of class contact hours per week. You are expected to take an average of 5 additional hours of non-class contact hours per week to complete assessments, prepare for your discussion topic, do the readings and prepare for the end of term test.

Week Date Mon	Class 1 (Monday, 2hr)	Discussion question	Class 2 (Thursday, 2h)	Assessment
1 Sept 16	Introduction part 1, and discussion – Led by Bonser/Moles	Is the biotic interactions hypothesis a zombie idea?	Introduction part 2 (field trip and major assignment), and discussion 2 – led by Bonser and Moles	
2 Sept 23	Lecture led by Bonser/ Moles	Experimental design and data analysis	Open lab	
3 Sept 30	Discussion – led by students	To be decided by students	Open lab	Quiz at the start of class
4 Oct 7	Labour day		Open lab	
5 Oct 14	FIELD TRIP – 5 days (11-15 Oct) No classes			
6 Oct 21	Discussion – led by students	To be decided by students	Open lab	Quiz at the start of class
7 Oct 28	Discussion – led by students	To be decided by students	Open lab	Quiz at the start of class
8 Nov 4	Discussion – led by students	To be decided by students	Open lab	Quiz at the start of class
9 Nov 11	Discussion – led by students	To be decided by students	Debates	Quiz at the start of class Research project from field trip due 11 November
10 Nov 18	Discussion – led by students	To be decided by students	Revision and summary	Quiz at the start of class
11 Nov 25	End of term test			End of term test

5. Assessment

5.1 Assessment tasks and feedback

Task	Knowledge & abilities assessed	Assessment Criteria	% of total mark	Date of		Feedback		
				Release	Submission	WHO	WHEN	HOW
Discussion groups	Appropriate assigned reading, depth of knowledge of research area, peer engagement	Detailed marking schedule available on Moodle.	25	16 September	Throughout session	A.Prof Bonser / Prof Moles	After the completion of discussion groups	Written comments and grades
Research project	Quality of submitted report. The submitted report will be similar to a scientific paper.	Detailed marking schedule available on Moodle.	45	19 September	11 November	A.Prof Bonser / Prof Moles	By 29 November	Written comments and grades
End of session test	General knowledge of research material presented by their peers throughout the session	Graded answers.	10	25 November	25 November	A.Prof Bonser / Prof Moles	by 29 November	Marks will be posted on Moodle
Quizzes on readings	Understanding of weekly assigned readings.		20	30 Sep, 21 Oct, 28 Oct, 4 Nov, 11 Nov, 18 Nov	30 Sep, 21 Oct, 28 Oct, 4 Nov, 11 Nov, 18 Nov	A.Prof Bonser / Prof Moles	1 week after each quiz.	Grades

Further information

UNSW grading system: <https://student.unsw.edu.au/grades>

UNSW assessment policy: <https://student.unsw.edu.au/assessment>

5.2 Assessment criteria and standards

Please see Moodle for marking rubrics for each assessment

5.3 Submission of assessment tasks

Assignments will be done in class (quizzes, test), or submitted online via Moodle. Students who are not able to complete the assignments on time should discuss their situation directly with Prof. Moles or A.Prof. Bonser. Late submissions that have not been approved by Prof. Moles or A. Prof. Bonser will attract a penalty of 10% per day.

5.4. Feedback on assessment

See assessment tasks section 5.1 for details on feedback provided for each assignment

6. Academic integrity, referencing and plagiarism

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.¹ 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 and **plagiarism** can be located at:

- The *Current Students* site <https://student.unsw.edu.au/plagiarism>, and
- The *ELISE* training site <http://subjectguides.library.unsw.edu.au/elise/presenting>

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

7. Readings and resources

Text Books	There is no text book assigned for this course. Rather, we explore the primary peer-reviewed literature (journals) on research in plant ecology. Web of Science and Scopus are excellent resources for searching and exploring the scientific literature. Both of these resources can be accessed
-------------------	---

¹ International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

	through the UNSW library web site. The UNSW library provides electronic access to most relevant journal articles
Course Manual	There is no course manual for plant ecology. Rather, resources (such as these course introduction pages) will be posted on the course Moodle site. A handout with information for the field trip will be provided early in the session.
Required Readings	Readings for discussion groups are available on the course Moodle site. Students are expected to read and discuss the issues raised in these papers.
Additional Readings	Optional additional readings listed in discussion group information
Societies	Ecological Society of Australia (ecolsoc.org.au); Ecological society of America (esa.org); British Ecological Society (britishecologicalsociety.org)
Computer Laboratories or Study Spaces	The herbarium on the fourth floor of the biosciences building is an excellent resource, students will frequently work in the herbarium. Computers are available in GO7, with all the usual software for assignment preparation.



8. Administrative matters

School information	<p>School website: http://www.bees.unsw.edu.au/</p> <p>School office – The Biosciences Student Office is where to go for administrative matters relating to BEES courses. It is located on the ground floor of the biological sciences building, room G27. BEESinfo@unsw.edu.au</p>
Occupational Health and Safety	<p>Information on relevant Occupational Health and Safety policies and can be found on the following website: http://www.bees.unsw.edu.au/health-and-safety</p> <p>UNSW OHS Home page: http://safety.unsw.edu.au/</p>
Equity and Diversity	<p>Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course Convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or http://www.studentequity.unsw.edu.au/).</p> <p>Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.</p>
Student complaint procedure	<p>http://student.unsw.edu.au/complaints</p> <p>School contact</p> <p>Dr Jes Sammut j.sammut@unsw.edu.au</p> <p>Faculty contact</p> <p>A/Prof Chris Tisdell, Associate Dean (Education) cct@unsw.edu.au, Tel: 9385 6792</p> <p>University contact</p> <p>Student Conduct and Appeals Officer (SCAO) within the Office of the Pro-Vice-Chancellor (Students) and Registrar. Telephone 02 9385 8515, email studentcomplaints@unsw.edu.au</p>

9. Additional support for students

- The Current Students Gateway: <https://student.unsw.edu.au/>
- Academic Skills and Support: <https://student.unsw.edu.au/academic-skills>
- Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>
- Disability Support Services: <https://student.unsw.edu.au/disability-services>
- UNSW IT Service Centre: <https://www.it.unsw.edu.au/students/index.html>