

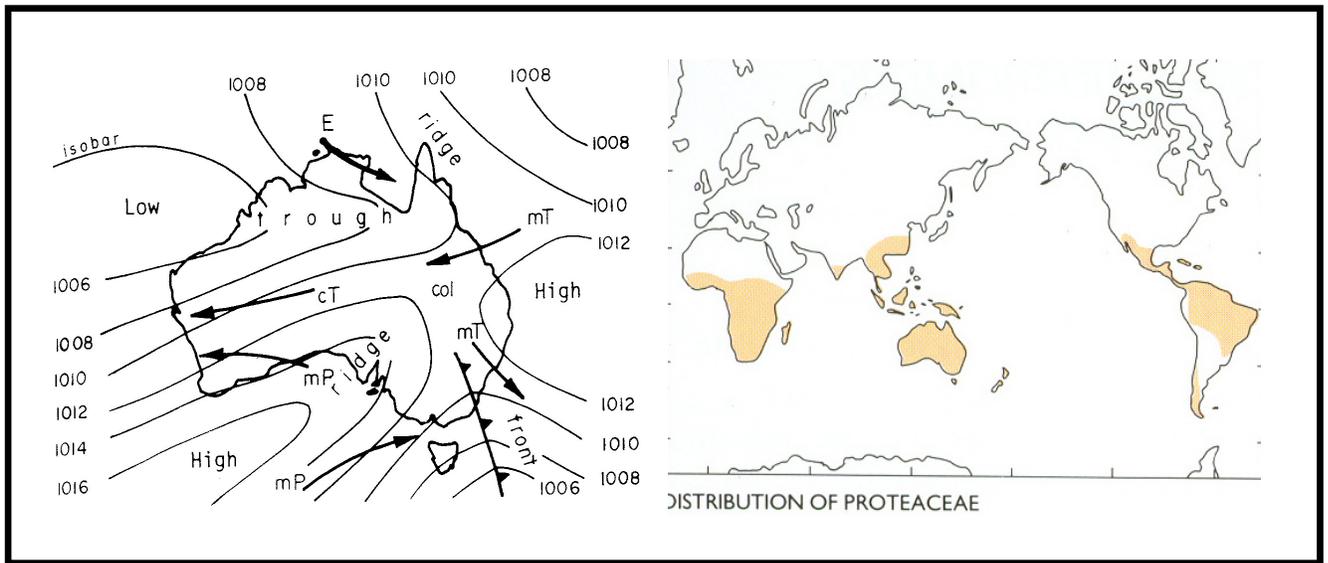


**UNSW**  
SYDNEY

Australia's  
Global  
University

School of Biological, Earth and  
Environmental Sciences,  
Faculty of Science

GEOS2711  
AUSTRALIAN CLIMATE  
AND VEGETATION



Term 2, 2019

## Information about GEOS2711

A/Prof Scott Mooney is the Course Convener in GEOS2711 and should be the first point of contact for any problems. You can check out what A/Prof Mooney does at <http://www.bees.unsw.edu.au/scott-mooney>: in GEOS2711 he will convene the course, present lectures and oversee the workshops, laboratory classes and field work. Please try to use the workshop times to raise issues: for any other problems please make an appointment (s.mooney@unsw.edu.au). SM's office is Room 552b in the Biolink section of the Biological Sciences Building (this is above the 4<sup>th</sup> floor lab that some of you may have done classes in).

Professor Jason Evans belongs to the UNSW Climate Change Research Centre <http://www.crc.unsw.edu.au> and is a Chief Investigator at the ARC Centre of Excellence for Climate Extremes. You can check out what he does at <http://www.bees.unsw.edu.au/jason-evans>. Prof Evans will present the climate lectures in GEOS2711 and run a couple of labs, focusing on climate variability.

Professor David Keith works on vegetation dynamics, fire and population and ecosystem modeling. You can check out what Prof Keith works on here: <http://www.ecosystem.unsw.edu.au/people/david-keith>. In GEOS2711 he will present lectures and he is leading the field components of the course (which are discussed in a couple of workshops).

Casey Gibson is a postgraduate student working on alpine ecology and specifically how Australia's alpine plants might respond to future climate change scenarios (see <https://www.bees.unsw.edu.au/casey-gibson>). Casey will present some lectures, and will demonstrate in the lab classes and in the field. We are also hoping that Frank Hemmings (Curator of the John T Waterhouse Herbarium see <http://www.bees.unsw.edu.au/herbarium>) will also join us in the field.

## Course Information

**Please note that with move to UNSW 3+, the timetable for GEOS2711 is complicated. You should also note that not all components (lectures, workshops, laboratories) run every week. If you are unsure see Moodle.**

Component	Day	Time	Location
<b>Lectures</b> There are 24 lectures: In most weeks (1, 3, 4, 6, 7, 8) there are 3 lectures; In some weeks (2, 8, 9, 10) there are 2; There are no lectures in week 5.	Monday	2 – 3 pm	Sci and Eng G05 <b>CLB 3</b>
	Tuesday	10 – 11 am	Mathews D
	Thursday	11 – 12 noon	Sci and Eng G05 <b>CLB 8</b>
<b>Workshops</b> There are 6 workshops: they run in weeks 1, 2, 3, 4, 6 and 7.	either W1 Thursday or W2 Thursday	12 noon – 2 pm 3 – 5 pm	lab 4 BioScience South
<b>Labs</b> There 4 lab classes (supplemented by ~16 hrs in the field): they run in weeks 2, 3, 6 and 7 (with week 4 TBC). There are important notes regarding <b>field work</b> below	either L1 Friday or L2 Friday	12 noon – 2 pm 3 – 5 pm	lab 4 BioScience South

## Important Notes about Fieldwork in GEOS2711

Field-work is an important component of GEOS2711 and so participation in the field exercises is the default expectation. Please make appropriate arrangements for the dates of the field trips (Thursday July 4<sup>th</sup> and Saturday July 6<sup>th</sup>) asap. The 'Field Report' (assessment task) requires your participation in at least one of the field trips but you should try to attend both (particularly if you are a student doing an Ecology or Geography Major). If, for any reason, you cannot attend these, please discuss this with the Course Convener (SM) before the end of Week 1.

Field trips will incur a cost to all students for bus hire. This cost will be kept to the absolute minimum. The amount will be announced asap.

## Course Description

<b>Course Description</b>	<p>GEOS2711 Australian Climate and Vegetation is a 6 unit of credit course.</p> <p><i>Contemporary climatic patterns and controls in Australia. Development of the Australian vegetation. Elements of the Australian vegetation and their distribution. Climate change with particular emphasis on the Quaternary. ENSO phenomena and climatic variability in Australia. Fire and vegetation interactions. The impact of European occupation in Australia. Field-work is an important component of the course and will involve expense to individuals.</i></p>
<b>Course Aims</b>	<p>The objective of <i>Australian Climate and Vegetation</i> is for students to reach an understanding of the topics summarised in the UNSW Handbook description. The course will present material relevant to the Australian climatic environment and vegetation of the continent. It covers introductory material associated with the academic disciplines of climatology, botany, biogeography and some elements of ecology and environmental science.</p>
<b>Student Learning Outcomes</b>	<p>By the end of this course, you will have an appreciation of the controls that shape the Australian climatic environment. These generic controls are also applicable to other locations on the Earth. Information regarding the nature of the Australian vegetation will lead to an understanding of the factors associated with the distribution of various communities, with a special emphasis on the vegetation of the Sydney Basin. Fieldwork provides generic skills in scientific observation and specific skills in vegetation sampling. The laboratory program is designed to consolidate many of these skills. The workshops in GEOS2711 are discussion-based and will consider conceptually difficult issues or reinforce aspect of the course content.</p>

## Relationship to Other Courses/Programs

Australian Climate and Vegetation is distinct from, but complementary to the Stage 2 course *Australian Surface Environments and Landforms* (GEOS2721). Together with GEOS2821 *Introduction to GIS and Remote Sensing*, these courses make up Stage 2 of Physical Geography at UNSW and provide the background for more advanced Physical Geography courses. GEOS2711 is also a core course in the Ecology Major (in Life Science, Environmental Management, Science and Advanced Science). The course has synergies with other geoscience and environmental science courses at UNSW and thereby provides an important element of geo- and environmental science programs. The course also has synergies with the 2<sup>nd</sup> year Biology course BIOS2051 *Flowering Plants*, which introduces the discipline of botany at UNSW.

<b>Graduate Attributes Developed in this Course</b>		
<b>Science Graduate Attributes</b>	0 = NO FOCUS 1 = MINIMAL 2 = MINOR 3 = MAJOR	<b>Activities/Assessment</b>
1. <b>Research, inquiry and analytical thinking abilities</b>	<b>3</b>	Lectures Workshops Fieldwork Laboratory Exercises final exam final exam, field report written field report assessed lab exercises
2. <b>Capability and motivation for intellectual development</b>	<b>2</b>	The lectures in this course are introductory thereby motivating students towards further enquiry. The course is designed to provide relevant knowledge for various environmental science disciplines.
3. <b>Ethical, social and professional understanding</b>	<b>2</b>	Professional understanding developed through all components of the course. No focus on ethical or social issues beyond those relating to human impacts, vegetation and climate.
4. <b>Communication</b>	<b>3</b>	Skills in scientific communication developed through lab and field reports, and in particular through the research-based exercise.
5. <b>Teamwork, collaborative and management skills</b>	<b>2-3</b>	Teamwork and collaboration are emphasized in the fieldwork activities. The various assessment tasks provide time management skills.
6. <b>Information literacy</b>	<b>2</b>	The course is designed to provide skills in information retrieval, with an emphasis on scientific enquiry.

# Rationale and Strategies Underpinning the Course

The learning and teaching rationale underpinning the course draws on of the following concepts:

- Learning is best achieved where students undertake a variety of tasks (reading, writing, discussing) and particularly those that stimulate higher-order thinking such as analysis, synthesis and evaluation. This is achieved through interactive lectures and discussion classes (workshops), where questions and critical thinking are encouraged and via lab and field exercises;
- The learning experience is also enhanced through the use of activities that are interesting and challenging. Students are more engaged in the learning process when the relevance of the material to professional, disciplinary and/or personal contexts is obvious. A variety of teaching methods and modes of instruction are employed in GEOS2711;
- In GEOS2711 dialogue is encouraged between the students and teachers and among students, through the use of the online learning space Moodle and via discussion and group work. The course aims for an inclusive learning and teaching experience, creating a community of learners.

## Recommended Text and Reading

Students should note that this course covers a wide range of material: you will be expected to read key references for each topic and to read around some of the topics. Some general references are listed below, and key references will be provided at the end of each lecture and generally available in Moodle. As a guide, the UNSW Academic Board suggests that a normal workload for a 6 UOC course is 9.4 hours per week (including class contact hours, time spent on assessable tasks and preparation/reading).

There is no compulsory text set for this course however it is highly recommended that students have access to a general text. Bridgman *et al.* (2008 *The Australian Physical Environment*, OUP) is extremely useful as an overview of climate and biogeography in Australia. In addition, some older texts are still relevant and cover the climate of Australia well (e.g. Sturman & Tapper 1996 *The Weather & Climate of Australia and New Zealand*, OUP). For vegetation it is hard to go past *Australian Vegetation* (2017 edited by David Keith, Cambridge University Press) or *Ocean Shores to Desert Dunes* (2004 also by David Keith).

## Other Resources and Support for Students

Students should note that dedicated pages for GEOS2711 exist on Moodle and all course hand-outs, lectures, labs and announcements will be managed using this resource. Additional electronic resources will also be provided via Moodle. This means that you should check these pages regularly.

## WHS in GEOS2711

There are relatively few WHS issues associated with this course. Nonetheless, students should be aware that the BEES WHS site (<http://www.bees.unsw.edu.au/health-and-safety>) contains important information relating to workplace safety. This information complements that which can be obtained from the UNSW Health & Safety website (<http://www.safety.unsw.edu.au>). Students should note that the labs are held in a designated 'laboratory' (BioScience South (E26) lab 4) meaning that you are required to wear lab coats and protective footwear in these classes (this includes most casual shoes but excludes sandals and thongs). The 'Risk Assessment' and measures to minimise risks associated with Fieldwork will be discussed at the relevant time.

# Lecture Outline

Lecture no.	when	Lecture title	lecturer
1	Monday week 1	Introduction to the course	A/Prof Scott Mooney
2	Tuesday week 1	General features of Australia	A/Prof Scott Mooney
3	Thursday week 1	Contemporary climatic patterns in Australia I	Prof Jason Evans
4	Tuesday week 2	The Australian vegetation: patterns	Prof David Keith
5	Thursday week 2	The Australian vegetation: controls	Casey Gibson
6	Monday week 3	Contemporary climatic patterns in Australia II	Prof Jason Evans
7	Tuesday week 3	The vegetation of the Sydney Basin	Prof David Keith
8	Thursday week 3	Field survey methods, classification and mapping for native vegetation	Prof David Keith
9	Monday week 4	Biogeography of Australian vegetation I	Prof David Keith
10	Tuesday week 4	Biogeography of Australian vegetation II	Prof David Keith
11	Thursday week 4	Quaternary environmental and vegetation change in Australia I	A/Prof Scott Mooney
12	Monday week 6	Quaternary environmental and vegetation change in Australia I	A/Prof Scott Mooney
13	Tuesday week 6	Fire and plant populations in Australia I	Prof David Keith
14	Thursday week 6	Fire and plant populations in Australia II	Prof David Keith
15	Monday week 7	Synoptic processes and rainfall in Australia I	Prof Jason Evans
16	Tuesday week 7	Synoptic processes and rainfall in Australia II	Prof Jason Evans
17	Thursday week 7	Southern conifers in Australia: past and contemporary distributions	A/Prof Scott Mooney
18	Monday week 8	Alpine ecology: climate and vegetation	Casey Gibson
19	Tuesday week 8	Twentieth Century climatic variability in Australia I	Prof Jason Evans
20	Thursday week 8	Twentieth Century climatic variability in Australia II	Prof Jason Evans
21	Monday week 9	Extreme climatic events in Australia I	Prof Jason Evans
22	Tuesday week 9	Extreme climatic events in Australia II	A/Prof Lisa Alexander
23	Monday week 10	Recent vegetation change in Australia	A/Prof Scott Mooney
24	Tuesday week 10	Summary and Review	A/Prof Scott Mooney

## **Workshop Outline**

Week	Topic
1.	Lab Induction, assumed knowledge in GEOS2711, aims and learning outcomes
2.	Climate drivers discussion: Controls on Oz climate
3.	Introduction to field methods: describing vegetation
4.	Potential field sites, logistics, safety and aims. Group organization and roles
6.	Field data collation. Field resources and data collection
7.	Australian scenarios for predicted climate change

There are no workshops after week 7 due to the Field Trip component of the course

## **Laboratory Outline**

Week	Topic
2.	Atmospheric circulation and synoptic patterns in the Australasian region
3.	Climatic variability across Sydney
4.	class TBC: field methods
5.	No classes
6.	Vegetation mapping
7.	Distribution of alpine flora under climate scenarios

There are no labs after Week 7 due to the Field Trip component of the course.

## Course Assessment

	%	Due date
1. Climatic variability across Sydney	15	end of week 4 (Friday 28 <sup>th</sup> June)
2. Written assignment	15	end of week 6 (Friday 12 <sup>th</sup> July)
3. Field Report	20	end of week 8 (Friday 26 <sup>th</sup> July)
4. Final Examination	50	normal exam period
Total:	100%	

## Important Notes about Assessment

- In this course all written assignments must be submitted electronically via Moodle. Instructions will be provided in the workshop classes.
- The assessment criteria for each of the assignments will be discussed in the workshops preceding that task. Each assignment will be assessed and returned within two weeks of submission with written feedback. Students should be aware that the amount of feedback is normally positively correlated with their own efforts!
- Assignments submitted after the due date will be penalised at the rate of 10% per day unless you have been granted Special Consideration (which usually requires a Medical Certificate). All outstanding assignments must be handed in by the end of Week 10. Work will only be accepted after this date if Special Consideration is granted.
- Attendance will be monitored regularly, and students are expected to conform to University regulations which state that final assessment may be refused if you attend less than 80% of classes.
- References in assessed material must use the 'in-text' or Harvard system (see <https://student.unsw.edu.au/referencing> for information).
- Academic misconduct will not be tolerated in any form in this course and particular attention is drawn to the information about plagiarism included over.

## Course Evaluation and Development

Student feedback is gathered regularly in GEOS2711 by various means, including "Course and Teaching Evaluation and Improvement (CATEI)", MyExperience, through discussion on Moodle (previously WebCT, Blackboard) and in classes via occasional end of session surveys. Such feedback is carefully considered with a view to acting on it constructively wherever possible. This feedback has helped to shape and develop this course resulting in continuous modifications to the lecture, lab and field content. Considerable 'tweaking' of the assessment schedule has occurred to better reflect the time that students have devoted to various tasks. In past evaluation students were concerned about plant identification during the fieldwork: this has been addressed with a lab devoted to field preparation and a focus on vegetation structure and dominant species only in the field. Since 2015 we have significantly enhanced the climate section of the course, with the addition of a specialist climatologist. It should be emphasized that in previous surveys a very high proportion of students described the course as "challenging and interesting". If you have any constructive criticism with a view to making this an even better course, please contact the course convener.

## What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own. Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via <https://student.unsw.edu.au/plagiarism>.

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre at <https://student.unsw.edu.au/individual-consultations-academic-support>.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

\* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

## Equity and Diversity

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 convener or with UNSW Disability Support Services <https://student.unsw.edu.au/disability>. 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.

## Grievance Policy

In all cases you should first try to resolve any issues with the course convener (SM). If this is unsatisfactory, you should contact the Director of Teaching in BEES (A/Prof Stephen Bonser [s.bonser@unsw.edu.au](mailto:s.bonser@unsw.edu.au)) or the Head of School, School of BEES (A/Prof Alistair Poore, [a.poore@unsw.edu.au](mailto:a.poore@unsw.edu.au)). UNSW has formal policies about the resolution of grievances that can be reviewed in MyUNSW A to Z Guide (see <https://student.unsw.edu.au/complaints>).

## Summary timetable for GEOS2711 Term 2, 2019

Week	Lecture 1 Monday 2pm Sci & Eng G05 CLB 3	Lecture 2 Tuesday 10am Mathews D	Lecture 3 Thursday 11am Sci & Eng G05 CLB 8	Workshop Thursday noon or 3pm Lab 4 BioSci South	Lab Friday noon or 3pm Lab 4 BioSci South	Assignments
1	Introduction to the course	General features of Australia	Climatic patterns in Australia I	Assumed knowledge Aims and learning outcomes	No lab	
2	Queen's birthday long weekend	The Australian vegetation: patterns	The Australian vegetation: controls	Climate dogs: Controls on Oz climate	Atmospheric circulation	
3	Climatic patterns in Australia II	The vegetation of Sydney	Field methods for sampling vegetation	Intro to field methods: Describing vegetation	Climatic variability across Sydney	
4	Biogeography of Australian vegetation I	Biogeog of Australian vegetation II	Quaternary vegetation in Australia I	Potential field sites, logistics, safety and aims. Group organisation and roles	Field methods (TBC)	Climatic variability across Sydney Assignment due before COB Friday 28 <sup>th</sup> June
5	no classes except Field: Thursday 4 <sup>th</sup> July and Saturday 6 <sup>th</sup> July					
6	Quaternary vegetation in Australia II	Fire and plant populations in Australia I	Fire and plant populations in Australia II	Field data collation Field resources and data collation	Vegetation mapping	Written assignment due before COB Friday 12 <sup>th</sup> July
7	Synoptic processes and rainfall in Australia I	Synoptic processes and rainfall in Australia II	Southern conifers	Australian scenarios for predicted climate change	Distribution of alpine flora under climate scenarios	
8	Alpine ecology	Twentieth Century climatic variability in Australia I	Twentieth Century climatic variability in Australia II	No workshops or labs		Field Report due before COB Friday 26 <sup>th</sup> July
9	Extreme climatic events in Australia I	Extreme climatic events in Australia II	No lecture	No workshops or labs		
10	Recent vegetation change in Australia	Course summary	No lecture	No workshops or labs		