ENVS302

Applied Climatology

S1 Day 2017

Dept of Environmental Sciences

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
Grant Edwards
grant.edwards@mq.edu.au
Contact via grant.edwards@mq.edu.au
12 Wally walk room 418
Email for appointment

Lecturer
Dean Howard
dean.howard@mq.edu.au
Contact via dean.howard@mq.edu.au
TBA
email for appointment

Lecturer
Paul Beggs
paul.beggs@mq.edu.au
Contact via 9850 8399
12 Wally walk 413
contact by email

Credit points
3

Prerequisites
(39cp at 100 level or above) including (ENVE216 or ENVS216 or GEOS216)

Corequisites

Co-badged status

Unit description
The emphasis in this unit is on practical aspects of atmospheric science. The unit begins by developing an understanding of interactions between the Earth's surface and the atmosphere, with emphasis on the planetary boundary layer. It deals with the collection of atmospheric data from a range of field instruments. The unit also deals with the analysis and interpretation of meteorological and climatological data in a variety of applied contexts. Applications include: air pollution meteorology; agriculture and forestry; engineering and architecture; urban climatology; and micrometeorology.

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:

Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere's role in biogeochemical cycles.

The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.

The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.

Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.

The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.

Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.

The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

General Assessment Information

Assignment 2 is based on the data collected during the ENVS302 Field study/practicals.

Assessment Tasks

Name	Weighting	Hurdle	Due
quiz 1	15%	No	week 4 practical
Assignment 1	20%	No	5/05/17 turnitin 10am
mid semester test	15%	No	Week 6 Prac period

Name	Weighting	Hurdle	Due
Assignment 2	35%	No	9/06/17
quiz 2	15%	No	week 13 practical period

quiz 1

Due: **week 4 practical**
Weighting: **15%**

The quiz comprises 20 multipler choice questions and usually requires about thirty minutes to an hour to complete. The quiz's in general are conducted in the ENVS302 Practical or Lecture classes. Questions in the quiz are randomised. It will be drawn from lecture and practical material covered prior to the date of the test. Feedback is available to students as soon as they complete a quiz. This feedback includes their number grade, an indication of if each question was answered correctly or not, and a written response to the answer provided for each question

On successful completion you will be able to:

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere’s role in biogeochemical cycles.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assignment 1

Due: **5/05/17 turnitin 10am**
Weighting: **20%**

Assignment #1, Literature review on an Atmospheric Boundary Layer topic. Further instructions to be posted on ilearn.

On successful completion you will be able to:

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere's role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

mid semester test

Due: **Week 6 Prac period**
Weighting: **15%**

The mid semester test is a closed book test carried out in Prac period of week 6. The only aid allowed is a scientific calculator. No smart phones allowed. The test covers the material covered in the lectures delivered by Dr. Edwards. Test 2 hrs in duration.

On successful completion you will be able to:

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere's role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret

the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assignment 2

Due: **9/06/17**
Weighting: **35%**

This assignment involves group presentations and individual reports based on the field/practical components of this module. Further details will be posted on ilearn.

On successful completion you will be able to:

- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

quiz 2

Due: **week 13 practical period**
Weighting: **15%**

The quiz comprises 20 multipler choice questions and usually requires about thirty minutes to an hour to complete. This quiz covers the Urban Climate lectures delivered by A/Prof. Paul Beggs. Questions in the quiz are randomised. It will be drawn from lecture and practical material covered prior to the date of the test. Feedback is available to students as soon as they complete a quiz. This feedback includes their number grade, an indication of if each question was answered correctly or not, and a written response to the answer provided for each question

On successful completion you will be able to:

- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Delivery and Resources

The required text for this unit is Oke TR (1987) Boundary layer climates (2nd ed). Routledge, London, and there are enough copies in the Co-op Bookshop for each ENVE302 student to purchase a copy. There may also be second-hand copies around. If all else fails, the Library has four copies (at least some of which will be in Reserve, with the remaining copies in the Main Collection). [QC981.7.M5.O34/1987].

You will be required to supply your own computer storage media – USB disks or blank CD ROMs - for data storage or records of what you have been working on in the practical classes. Finally, you will need to own, or have access to, a reasonable scientific calculator (including functions ln, log10, ex, sin, cos, tan, ?, and 1/x) for this unit.

Recommended Texts

• Foken T. (2008) Micrometeorology, Springer-Verlag, Heidelberg, [QC883.8]

• Arya SPS (2001) Introduction to micrometeorology (2nd ed). Academic Press, San Diego. [QC883.8.A79/2001]

• Monteith JL, Unsworth MH (2008) Principles of environmental physics (3rd ed). Edward Arnold, Melbourne. [QH505.M58/1990]

• Scorer RS (2002) Air pollution meteorology. Horwood, Chichester. [QC882.S35] • Thompson RD, Perry A (1997) Applied climatology: principles and practice. Routledge, London. [QC981.A57/1997]

• Hewitt C.N. and A.V. Jackson (2009) Atmospheric Science for Environmental Scientists, Wiley-Blackwell UK [QC861.3 AB66] • Larcher W (2003) Physiological plant ecology: ecophysiology and stress physiology of functional groups (4th ed). Springer, New York. [QK717.L3713/2002]

Recommended Journals in the Library

Agricultural and Forest Meteorology [S600.A35 and Electronic journal]

Atmospheric Environment [TD881.A8 and Electronic journal]

Boundary-Layer Meteorology [QC851.B6 and Electronic journal] Energy and Buildings [TJ163.5.B84.E523 and Electronic journal]

International Journal of Biometeorology [QH543.I5 and Electronic journal]

International Journal of Remote Sensing [G70.4.I56 and Electronic journal]

Journal of Applied Meteorology [QC851.A66 and Electronic journal]

Journal of Applied Meteorology and Climatology [QC851.A66 and Electronic journal]

Journal of Geophysical Research [QC811.J6]

Meteorological Applications [QC851.M15]

Photogrammetric Engineering and Remote Sensing [TA593.A2.P5]

Remote Sensing of Environment [G1.R4 and Electronic journal] Technical Note / World Meteorological Organization [QC851.W6444]

Theoretical and Applied Climatology [QC851.A732 and Electronic journal]

UNIT WEB PAGE AND GENERAL INSTRUCTIONS IN THE USE OF THE FACULTY OF SCIENCE PC LABS

• The web page for this unit can be found at: https://learn.mq.edu.au/

Unit Schedule

Week	Lecturer	Lecture Topics	Practical Topic	Assessment

1	GE	Welcome, and Introduction to boundary layer climates	no prac	
2	GE	Atmospheric stability	field prac (weather station)	-
3	GE	Turbulent diffusion in the planetary boundary layer (PBL)	field prac (balloon) rain out will then be held at field day.	-
4	GE	Plume behaviour in the PBL	Online Quiz	Quiz 1 (in practical class)-
5	GE	Modelling pollutant dispersion in the PBL	Modelling Prac Ausplume/ WindTrax	
6	GE	Mass balance	Mid semester test	mid semester test
7	DH	Principles of Atmospheric Measurements	Quality Assurance/ Quality Control of Data	QA/QC prac
Break			April 19, 20th field days	Oakdale
8	DH	Water in the Soil-Plant-Atmosphere Continuum	Computation of Field Results	Group Presentation: Quality Assurance/ Control. Assignment 1 due Friday May 5th turnitin
9	DH	Energy Exchange in Vegetated Ecosystems	Analysis and Interpretation of Field Results	Group Presentation: Results from Field Campaign Data
10	DH	Air Flow within Canopies and Shelter Breaks	Analysis and Interpretation of Field Results	Group Presentation: Analysis and Interpretation of Results
11	PB	Urban climatology I – radiation and energy	Urban radiation prac	
12	PB	Urban climatology II - hydrology & 18: Urban climatology III - airflows	wind tunnel prac CPP	Assignment 2 due Friday June 9th 5 pm, turnitin (individual)

13	PB	Urban climatology IV – heat islands	Quiz 2	Quiz 2

Learning and Teaching Activities

Learning and Teaching Activity

1. One 2 hr. lecture held Friday 9-11, E7B 200 Tutorial room. 2. One 3 hr. practical Thursday 12-15 either in field or computer lab E5A 270, 11 wally walk 3. Potential Field Study April, 19,20,potential days offsite at Oakdale NSW. Alternatively field pracs will be held in prac periods on campus. These include Micrometeorological flux measurement, weather station measurement and boundary layer profiling. 4. Other pracs involve but are not limited to: Ausplume/Windtrax modelling Prac, CPP wind Engineering visit, Presentation of data sets and methods, Urban radiation.

Assessment activity

2 Quizzes 1 Written Midterm Exam 2 Assignments

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

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some

appreciation for the atmosphere's role in biogeochemical cycles.

- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1
- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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 outcomes

- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- The ability to describe a research problem, propose its analysis, and then articulate the

respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1
- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere’s role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1
- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere’s role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- Practical knowledge to undertake analysis of climatic data and work with apparatus common to the Climate Science discipline.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1

- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere's role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1
- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere's role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- Practical laboratory and field based skills associated with typical measurement problems in the field of climate science.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1
- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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

- Demonstrate sufficient knowledge and conceptual understanding of the dispersive capabilities of the atmospheric environment near the surface of the earth, how pollutants emitted into the atmospheric environment move and interact with the surface, and some appreciation for the atmosphere's role in biogeochemical cycles.
- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- quiz 1
- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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

- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.

- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

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

- The ability to formulate a problem, develop its methodical analysis, and critically interpret the findings in order to find an appropriate Applied Climatology solution.
- The ability to contend with the temporal and spatial scales of Climate Science and constraints associated with the absence of a universal approach or answer, in a creative and innovative manner.
- The ability to examine, analyze, interpret and integrate scientific information from various primary and secondary sources.
- The ability to describe a research problem, propose its analysis, and then articulate the respective findings through oral, written, and non-traditional media which are important tools in the communication of Applied Climate Science.

Assessment tasks

- Assignment 1
- mid semester test
- Assignment 2
- quiz 2

Changes from Previous Offering

Field study reduced to 1 or 2 days at Oakdale, NSW research site