



The  
University  
of Sydney

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10

# Agriculture, Food and Natural Resources handbook

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# Acknowledgements



## The Arms of the University

### **Sidere mens eadem mutato**

*Though the constellation may change  
the spirit remains the same*

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Faculty handbooks and their respective online updates, along with the *University of Sydney Calendar*, form the official legal source of information relating to study at the University of Sydney. Please refer to the following websites:

[www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks)  
[www.usyd.edu.au/calendar](http://www.usyd.edu.au/calendar)

### **Amendments**

All authorised amendments to this handbook can be found at [www.usyd.edu.au/handbooks/handbooks\\_admin/updates2010](http://www.usyd.edu.au/handbooks/handbooks_admin/updates2010)

### **Disability access**

An accessible version of this handbook (in Microsoft Word) is available at [www.usyd.edu.au/handbooks/handbooks\\_disability](http://www.usyd.edu.au/handbooks/handbooks_disability)

### **Resolutions**

#### *The Coursework Clause*

Resolutions must be read in conjunction with the *University of Sydney (Coursework) Rule 2000 (as amended)*, which sets out the requirements for all undergraduate courses, and the relevant resolutions of the Senate.

#### *The Research Clause*

All postgraduate research courses must be read in conjunction with the relevant rules and resolutions of the Senate and Academic Board, including but not limited to:

1. The *University of Sydney (Amendment Act) Rule 1999 (as amended)*.
2. The *University of Sydney (Doctor of Philosophy (PhD)) Rule 2004*.
3. The resolutions of the Academic Board relating to the Examination Procedure for the Degree of Doctor of Philosophy.
4. The relevant faculty resolutions.

### **Disclaimers**

1. The material in this handbook may contain references to persons who are deceased.
2. The information in this handbook was as accurate as possible at the time of printing. The University reserves the right to make changes to the information in this handbook, including prerequisites for units of study, as appropriate. Students should check with faculties for current, detailed information regarding units of study.

### **Price**

The price of this handbook can be found on the back cover and is in Australian dollars. The price includes GST.

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You can purchase handbooks at the Student Centre, or online at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks)

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# Important dates

## University semester and vacation dates for 2010

Summer/Winter School lectures	Dates
Summer School – December program	Begins: Monday 7 December 2009
Summer School – main program	Begins: Monday 4 January 2010
Summer School – late January program	Begins: Monday 18 January
Winter School – main program	Monday 28 June to Friday 24 July
Semester One	Dates
International student orientation (Semester One) – STABEX	Monday 15 February and Tuesday 16 February
International student orientation (Semester One) – full degree	Wednesday 18 February and Thursday 19 February
Lectures begin	Monday 1 March
AVCC Common Week/non-teaching Easter period	Friday 2 April to Friday 9 April
International application deadline (Semester Two) *	Thursday 30 April *
Last day of lectures	Friday 4 June
Study vacation	Monday 7 June to Friday 11 June
Examination period	Tuesday 15 June to Saturday 26 June
Semester ends	Saturday 26 June
AVCC Common Week/non-teaching period	Monday 5 July to Friday 9 July
Semester Two	Dates
International student orientation (Semester Two) – STABEX	Monday 19 July and Tuesday 20 July
International student orientation (Semester Two) – full degree	Wednesday 22 July and Thursday 23 July
Lectures begin	Monday 26 July
AVCC Common Week/non-teaching period	Monday 27 September to Friday 1 October
Last day of lectures	Friday 29 October
International application deadline (for Semester One, 2011) *	Saturday 30 October *
Study vacation	Monday 1 November to Friday 5 November
Examination period	Monday 8 November to Saturday 20 November
Semester ends	Saturday 20 November

\* Except for the faculties of Dentistry, Medicine and the Master of Pharmacy course. See [www.acer.edu.au](http://www.acer.edu.au) for details.

## Last dates for withdrawal or discontinuation for 2010

Semester One – units of study	Dates
Last day to add a unit	Friday 12 March
Last day for withdrawal	Wednesday 31 March
Last day to discontinue without failure (DNF)	Friday 23 April
Last to discontinue (Discontinued – Fail)	Friday 4 June
Semester Two – units of study	Dates
Last day to add a unit	Friday 6 August
Last day for withdrawal	Tuesday 31 August
Last day to discontinue without failure (DNF)	Friday 10 September
Last day to discontinue (Discontinued – Fail)	Friday 29 October
Last day to withdraw from a non-standard unit of study	Census date of the unit, which cannot be earlier than 20 per cent of the way through the period of time during which the unit is undertaken.
Public holidays	Dates
Australia Day	Tuesday 26 January
Good Friday	Friday 2 April
Easter Monday	Monday 5 April
Anzac Day	Monday 26 April
Queen's Birthday	Monday 14 June
Labour Day	Monday 4 October





# How to use this handbook

## What is a handbook?

The handbook is an official publication and an essential guide for every student who studies at the University of Sydney. It is an important source of enrolment information. It can also help you with more than just planning your course of study.

As a student at the University of Sydney you need to be aware of course structures and content, who your lecturers are, as well as examination procedures.

You should also become familiar with University policies and faculty rules and regulations. This handbook supplies a lot of this information.

It will also point you to places and people around the University who can help with enquiries about library loans, child care, fees, casual employment, places to eat and stay, support groups and much more.

## What new students need to know

- terminology used for courses and programs of study
- semester dates and examination periods
- important contact details
- how to plan your study program
- rules and policies on assessment, satisfactory progression, honours, etc
- what University services are available and where to find them
- how to get around campus.

At the beginning of many of these chapters there will be explanations to help you proceed further.

## Where to find information

### Course terminology

University terminology, such as 'credit point', 'unit of study', and 'WAM', can be found in the **Abbreviations** and **Glossary** chapters, at the back of this handbook.

### Dates

The start and finish dates of semester can be found in the front section of the handbook. Summer School and Winter School dates are in the general information section at the back of the handbook.

### Contents and index

The comprehensive **Contents** section at the front of the handbook explains the details you'll find within each chapter.

You'll find information like:

- how and where to contact faculty staff
- how to select your units of study and programs
- a list of degrees
- detailed information on all units of study, classified by unit identifiers (a four-alpha, four-digit code and a title)
- electives and streams
- scholarships and prizes
- information specific to faculties.

The **Index** lists units of study only. It allows you to check every reference which refers to your unit of study within the handbook. It is divided into two parts, and lists units of study alphabetically (by course name) and again by course code (alphanumeric).

## Colour-coded sections

- Ivory – for undergraduate courses
- Blue – for postgraduate courses

## Faculty rules and regulations

Faculty resolutions are the rules and regulations that relate to a specific faculty. They can generally be found in their own chapter, or next to the relevant units of study.

These should be read along with the University's own *Coursework Rule 2000 (as amended)* which is described in the **Essential information for students** chapter near the end of this book. Together they outline the agreement between student and faculty, and student and University.

## General University information

This is information about the University in general, rather than information specific to the faculty. This information is at the back of the book and includes, among other things:

- terminology and abbreviations used at the University
- campus maps to help you find your way around
- Summer School and Winter School information
- information for international students
- student services.

## Course planner

You might like to plot the course of your degree as you read about your units of study. Use the planner at the back of this handbook.

## Timetables

For information about personal timetables, centrally timetabled units of study, and venue bookings, see:  
[www.usyd.edu.au/studentcentre/timetabling.shtml](http://www.usyd.edu.au/studentcentre/timetabling.shtml)

For the session calendar, see:  
<http://web.timetable.usyd.edu.au/calendar.jsp>

## Students with a disability

For accessible (word, pdf and html) versions of this document, see:  
[www.usyd.edu.au/handbooks/handbooks\\_disability](http://www.usyd.edu.au/handbooks/handbooks_disability)

You can find information on Disability Services in the **General University information** section of the handbook. The service can provide information regarding assistance with enrolment and course requirement modifications where appropriate.

For details on registering with the service and online resources, see:  
[www.usyd.edu.au/disability](http://www.usyd.edu.au/disability)

## Handbook updates

The information in this handbook is current at the time of publication. Further information on University policies, such as plagiarism and special consideration, can be found on the University's website, along with official handbook amendments.

[www.usyd.edu.au/handbooks/handbooks\\_admin/updates2010](http://www.usyd.edu.au/handbooks/handbooks_admin/updates2010)

**Feedback regarding this handbook is welcome.**  
[info@publications.usyd.edu.au](mailto:info@publications.usyd.edu.au)





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# Welcome from the Dean



In this, its centenary year, the Faculty of Agriculture, Food and Natural Resources is proud to celebrate its rich and illustrious history. Our founding principles of thorough scientific investigation and teaching excellence have shaped our development into a community of distinguished international researchers and educators. Looking ahead, the faculty's offering is unique with modern, innovative degrees that produce highly skilled graduates equipped with the skills needed to address the changing world we live in. Our focus is on providing the knowledge that will underpin solutions to the most significant and challenging issues of our time and we welcome students who share our passion.

Finding solutions is an exciting career path, and opportunities for skilled graduates in "new science" areas are growing exponentially. Previously unheard of fields such as carbon and water trading, food futures and sustainability complement recent developments in science and technology.

Our degrees offer unique and unparalleled educational experiences that encompass a comprehensive range of disciplines. The carefully constructed curriculum prepares graduates for a range of careers. We pride ourselves on teaching excellence and students are able to learn from internationally renowned research leaders. Units offered in the third and fourth year allow students to tailor their focus and develop cutting edge knowledge of their chosen fields of study.

Our emphasis on ecosystem science – those that truly impact at local, regional and global scales – meets head-on the challenges of the future. On behalf of the faculty, I warmly invite you to join us and begin your exciting career.

**Professor Mark Adams**  
*Dean*





# 1. Important handbook information

## About this handbook

Welcome to the Faculty of Agriculture, Food and Natural Resources handbook. This handbook will provide you with a great deal of information about the faculty and the University. In particular, it will guide you to who is who in the faculty, outline the requirements of different degrees, and explain how each can be satisfied.

**A welcome from the Dean** can be found on the previous page.

**Chapter 1** (this chapter) has important information that should be read by all students.

**Chapter 2** gives the names of people you may need to contact during the year.

**Chapter 3** contains frequently asked questions affecting students in the faculty. You should read this chapter in conjunction with Chapters 1, 4, 5 and 6.

**Chapter 4** explains the requirements for each undergraduate degree.

**Chapter 5** gives undergraduate unit of study descriptions.

In **Chapter 6** you will find the fine print - the undergraduate degree resolutions (rules) covering your degree. The information in this chapter takes precedence over all other earlier information. You should definitely read the relevant parts of this chapter, and refer to them from time to time during your studies to make sure you are on track to satisfy the requirements of your degree.

**Chapter 7** contains scholarships and prizes information for undergraduate students.

**Postgraduate students** should look at Chapters 8, 9 and 10 for information regarding the requirements for their degrees.

**Chapter 8** contains the requirements for each postgraduate degree and postgraduate unit of study information is in **Chapter 9**.

Like Chapter 6, **Chapter 10** contains the degree resolutions or rules, this time for postgraduate degrees. You should make sure you read

the resolutions pertaining to your degree. It will be useful to read this in conjunction with the information in Chapter 8.

**Chapter 11** contains scholarships and prizes information for postgraduate students.

Additional faculty information is contained in **Chapter 12**.

The sections following Chapter 12 are handy reference pages for all sorts of services on campus or to explain that obscure term.

The **index by alpha code** and the **index by name** provide unit of study information and the **campus maps** will help you find your way around the Camperdown, Cobbity and Narrabri campuses.

You can use the final section of this handbook, the **course planner**, to track your study.

We hope you find this handbook very useful. If you need any further information please don't hesitate to contact a member of the faculty.

## Important student information

Students enrolled in units of study offered by the Faculty of Agriculture, Food and Natural Resources are required to familiarise themselves with the following key policies:

### Special consideration

Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given special consideration in relation to the determination of their results.

### Student plagiarism: coursework policy and procedure

The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details of special consideration and student plagiarism policies are provided later in this handbook.





## 2. Guide to the Faculty

### Faculty of Agriculture, Food and Natural Resources

Phone: +61 2 9351 2935  
 Fax: +61 2 9351 2945  
 Email: dean.agriculture@usyd.edu.au  
 Web: www.agric.usyd.edu.au

#### Dean

Mark Adams, BSc PhD *Melbourne*

#### Pro Dean

Alexander B McBratney, BSc PhD DSc *Aberd*

#### Associate Deans

Development: David Guest, BScAgr PhD *Sydney*  
 Postgraduate Students: Damien Field, BSc PhD MEd (Higher Education) *Sydney*  
 Research: Alexander B McBratney, PhD DSc *Aberd*  
 Teaching and Learning: Stephen R Cattle, BScAgr PhD *Sydney*

#### Research Group Leaders

Agosystems: John Crawford, BSc *Glasgow* PhD *London*, FRSE FIMA  
 Applied Economics: Michael Harris, BEc *ANU* PhD *Melbourne*  
 Crop and Food Systems: Richard Trethowan, BScAgr PhD *Sydney*

#### Degree Coordinators

Agricultural Science: Brian Jones, BHortSc *UWS* PhD *Toulouse*  
 Economics: Paulo Santos, BAgSc MSc *ISA-Lisboa* PhD *Cornell*

#### Professional Experience Coordinator

Lynn A Henry, BEc DipAgEc *NE*

#### Faculty office staff

*Dean's Executive Assistant*  
 Prue Winkler, BA *Newcastle*

#### *Faculty Manager*

Robyn Turner, BSc(Hons) *UNSW*

#### *Finance*

Chloe Fong, BCom *Sydney*  
 Arnold Lai, MBus *UTS*

#### *Alumni Relations Officer*

Skaidy Gulbis, BA Dip Ed *Sydney* MA in Comm Mgt *UTS*

#### *Marketing and Science Communicator*

Lucy Buxton, BSc *UCL* PhD *UTS*

#### *Student and Staff Services*

Fortunée Cantrell  
 Nancy Cheng  
 Clare Higgins, BSc *Sydney*  
 Pamela J Stern, BA *UNSW*

#### *IT and Web Administration*

Annette Vervoort, BFacility Management *Diedenoort*

Information current as at 31 October 2009

### Teaching and Research Staff

#### Professors

Mark Adams, BSc PhD *Melbourne*  
 Les Copeland, BSc PhD *Sydney*, FRACI CChem (*Agriculture*)  
 John Crawford, BSc *Glasgow* PhD *London*, FRSE FIMA (*Judith and David Coffey Chair in Sustainable Agriculture*)  
 David Guest, BScAgr PhD *Sydney* (*Plant Pathology*)  
 Ivan R Kennedy, PhD DSc(Agric) *UWA*, FRACI CChem (*Agricultural and Environmental Chemistry*)  
 Alexander B McBratney, BSc PhD DSc *Aberd* (*Soil Science*)  
 Bruce G Sutton, BScAgr *UQ* PhD *ANU*

#### Associate Professors

Ross G Drynan, BAgSc *UQ* PhD *UNE*  
 Michael Kertesz BSc *Monash* PhD *Camb*  
 M Robyn McConchie, BSci *Lond* MA (Ed) *Macquarie* PhD *LSU* (on secondment)  
 IOA Odeh, BSc(Agric) *Ibadan* MSc *Ahmadu Bello* PhD *Adelaide*  
 Balwant Singh, BSc(Agr) MSc(SoilSc) *Hisar* PhD *UWA*

#### Senior Lecturers

Tihomir Ancev, BScAgr *Skopje* MScEc *Reykjavik* PhD *Oklahoma*  
 Dhia Al Bakri, BSc *Mosul* MSc PhD *Sheff*  
 Margaret Barbour, MSc *University of Waikato* PhD *ANU*  
 Tina Bell, BSc PhD *UWA*  
 Thomas Bishop, BScAgr PhD *Sydney* GradCertEduStu (Higher Education)  
 Robert A Caldwell, MSc PhD *Sydney*, MRACI CChem  
 Lindsay C Campbell, BSc PhD *Sydney*  
 Stephen R Cattle, BScAgr PhD *Sydney*  
 Peter Franks BSc PhD *ANU*  
 Michael Harris, BEc *ANU* PhD *Melbourne*  
 Brian Jones, BHortSc *UWS* PhD *Toulouse*  
 Willem Vervoort, MSc *Wageningen* PhD *Georgia*

#### Lecturers

Peter Ampt, MSc(Agriculture) *Sydney*  
 Stephen Burgess, BSc *Murdoch University* PhD *UWA*  
 Shyamal Chowdhury, BEc *Jahangirnagar* MEC *Kiel* PhD *Bonn*  
 Damien Field, BSc PhD MEd (Higher Education) *Sydney*  
 Sarah Mansfield, MSc *University of Auckland* PhD *UC Berkeley*  
 Andrew Merchant, BSc PhD *Melbourne*  
 Carina Moeller, Dipl-Ing agr *Justus-Liebig* Dr sc agr *Hohenheim*  
 Paulo Santos, BAgSc MSc *ISA-Lisboa* PhD *Cornell*  
 Daniel Tan, BAppSc PhD *UQ* GradCertEdStu (Higher Education)  
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 Elizabeth Nolan, BScAgr *Sydney*  
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 Greg Constable, MScAgr PhD *ANU*  
 Brian R Cullis, BSc *Sydney* PhD *UNSW*  
 Brian Fisher, BScAgr PhD *Sydney*  
 Barry V McCleary, BScAgr PhD DScAgr *Sydney*  
 Gordon Rogers, PhD *UWS*  
 Brett Summerall, BScAgr PhD *Sydney*



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Andrew Reeson, BA *Oxford* MNatResEc *UQ* PhD *Southampton*

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#### Technical Officer (Plant and Insects)

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#### Technical Officer (Plant Pathology)

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T Gordon MacAulay, MSc MAgrSc *Melbourne* PhD *Guelph*

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Beate Wildner

### GRDC Professor of Cereal Rust Research, Director of Rust Research

Robert F Park, BSc PhD *La Trobe*

### Professor of Plant Breeding

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### Director of Amenity Plant Science

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Donald R Marshall, PhD *Calif BScAgr Sydney*

*Emeritus Professor in Cereal Genetics and Cytogenetics*

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Meiqin Lu, MScAgr *Zhejiang PhD Sydney*



## 3. Frequently asked questions

This chapter is intended to answer frequently asked questions for students in the Faculty of Agriculture, Food and Natural Resources.

It should be stressed that the information in this chapter is intended to be a guide only. All students will have to decide for themselves how to plan their course of study to suit their particular interests and situation. It is recommended that you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will also be useful to revisit your plans during your studies as your interests take more detailed shape.

### How many credit points should I take each semester?

Full-time undergraduate students should take 24 credit points each semester. Most units of study are valued at 6 credit points. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your undergraduate degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part-time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree. The degree summaries in this handbook assume you will enrol full-time.

### Do I need to be full-time?

If you receive any financial support, whether from a University scholarship or from the government, you may need to enrol as a full-time student. You should check carefully the terms and conditions of that support before going part-time.

Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

International students are required to be full-time.

### Can I take units of study from other faculties?

Yes. You should refer to the course requirements sections of this handbook for specific information about your particular degree. Each faculty website has links to the units of study they offer. There are limits and exclusions, however.

### Can I get credit for previous tertiary study?

Yes. The amount of credit you can receive depends on your individual circumstances, but in general is capped at 48 credit points for an undergraduate degree already completed or 96 credit points for an incomplete degree.

If you apply for credit before enrolment and receive a letter in return specifying the credit awarded, you can make your unit of study choices with this information in mind when enrolling.

If you do not apply for credit before enrolling you will have to make unit of study choices as if you have had no previous university study. You should then apply for your credit request to be processed. Because of the large numbers of applications received during the enrolment period there can be a considerable delay in processing your application. It is in your best interests to apply in the year preceding your planned enrolment.

The faculty must sight originals of your academic transcripts, as well as unit of study descriptions clearly indicating credit point value or hours per week. You may only apply for credit ONCE in your degree.

### Are there any bridging courses available?

There are bridging courses in biology, chemistry and mathematics, designed to cover the assumed knowledge that students would normally cover in the Higher School Certificate (HSC). They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

### Who can enrol in advanced units of study?

Advanced units of study are available to those students enrolled in any program in the faculty who have performed at a high level in the HSC or who perform well in their studies at the University.

Consult an academic adviser about your eligibility to enrol in advanced level subjects in the first year of study.

Students should also consult the unit of study tables for assumed knowledge and prerequisite marks in the HSC required to enrol in advanced units of study. Advanced units of study are very demanding and students are required to perform at a higher standard than in normal units of study.

### What is a 'major'?

A major is a specialisation within an undergraduate degree. BAgEc and BResEc students must complete majors to graduate. It is useful for every undergraduate student to have an idea of what major, or group of majors, interest you now, so that you can plan each year of study properly. In some degrees it is possible to complete more than one major.

### What are degree resolutions?

Degree resolutions are the rules which must be followed in order to successfully complete a degree. All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies as it is each student's responsibility to meet the requirements of their degree. Degree resolutions, tables of undergraduate and postgraduate units of study available for each degree and unit of study descriptions appear in later chapters of this handbook.

### Where can I find my class timetable?

These will be available in orientation week. To obtain a personal timetable showing rooms and lecture and tutorial times, go to the web at [www.usyd.edu.au/timetable](http://www.usyd.edu.au/timetable) and follow the prompts. If you have trouble or do not have access to the web, you can go to the Student Centre in the Carslaw Building where computers are available.

You will be asked to enter your login name and password. These will be found on the last page of your enrolment form and at the bottom of your Confirmation of Enrolment sheet.

### Ensure that you know which classes you are in and find room locations before the first day of class.

The faculty takes all possible care to avoid timetable clashes for core units of study but it is the responsibility of every student to make sure that no timetable clashes exist between repeat or elective units.

### What happens in orientation week?

In orientation week, first year undergraduate students are introduced to the University and the faculty. The faculty orientation program runs for two days and includes an excursion to the University's Camden Farms.



### 3. Frequently asked questions

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#### **How can I find accommodation?**

If you need help in finding accommodation go to:  
[www.usyd.edu.au/stuserv/accommodation/index](http://www.usyd.edu.au/stuserv/accommodation/index)

#### **What if I need financial assistance?**

The University has a number of loan and bursary funds to assist students who experience financial difficulties. This assistance is not intended to provide ongoing income support but to help in emergencies and to supplement other income.

The Financial Assistance Office is located on Level 5 of the Jane Foss Russell Building G02, City Road (beside the Wentworth Building), Camperdown Campus  
Phone: + 61 2 9351 2416  
Fax: + 61 2 8627 8480  
Email: [fao@stuserv.usyd.edu.au](mailto:fao@stuserv.usyd.edu.au)

Further information can be found at:  
[www.usyd.edu.au/stuserv/financial\\_assistance\\_office](http://www.usyd.edu.au/stuserv/financial_assistance_office)

For information about student allowances provided by the Commonwealth Government go to:  
[www.centrelink.gov.au](http://www.centrelink.gov.au).

#### **Where do I find further information?**

##### *Faculty office*

The faculty office is based at:  
Suite 401, Biomedical Building  
1 Central Avenue  
Australian Technology Park  
Eveleigh NSW 2015

Phone: +61 2 8627 1000  
Fax: +61 2 8627 1099

All enquiries in relation to matters specific to the faculty can be made at this office in the first instance, including:

- information about admission to a degree of the faculty
- enrolments in the faculty
- applications for credit for previous studies
- facilities available in the faculty.

##### *Email*

The University gives you an email address. The University and the faculty CONSTANTLY send information to you via the University email address. This is the faculty's only method of communication to you in most cases.

**It is your obligation and your responsibility to check your email every day in order to be informed about matters concerning your candidature.**

##### *Noticeboards*

Information is also displayed on the faculty noticeboards. The main noticeboard for undergraduate students is in the foyer of the Watt Building. A postgraduate student noticeboard is located in the Watt Common Room (Level 1, Watt Building). Broader University information will be displayed on noticeboards around the campuses.

##### *Publications*

The University Map Guide, faculty handbooks and other publications are available from the Student Centre and also online at [www.usyd.edu.au](http://www.usyd.edu.au).

##### *Glossary*

The Glossary in this handbook may also provide you with very helpful information.

## 4. Undergraduate course requirements

### Brief introduction to undergraduate degree courses

Teaching in the undergraduate units of study in the faculty develops skills and graduate attributes. A Statement of Generic Graduate Attributes can be found in Chapter 12 of this handbook.

#### BACHELOR OF AGRICULTURAL ECONOMICS (BAgrEc)

*(Part-time study, during the daytime only, may be available in certain circumstances)*

**Assumed knowledge:** Mathematics.

The focus of this economics degree is on the development of analytical, quantitative, computing and communication skills with an emphasis on commodity markets and agricultural and natural resource issues. Skills highly regarded by employers are gained in fourth year through the completion of a research thesis, research exercises and research project reports. A wide range of elective courses is available.

**Major studies:** Include accounting (restricted entry), agribusiness management, agricultural economics, agricultural finance, agricultural marketing, agricultural policy, agricultural science, commercial law, econometrics, economics, finance, geography, government, international trade, management, marketing, modern languages, natural resource economics, psychology.

**Professional experience:** For students enrolling since 2008, this professional experience requirement is credited to the AFNR4001 unit of study. Overseas experience is encouraged.

**Professional recognition:** Undergraduates and graduates are eligible for membership of the Australian Agricultural and Resource Economics Society, the Economic Society of Australia, the Agribusiness Association of Australia and the American Agricultural Economics Association.

**Career opportunities:** Graduates are employed as applied economists and researchers with commodity and futures brokers, merchant banks and trading banks and by the Department of Agriculture, Fisheries and Forestry, ABARE, Meat and Livestock Australia and the Productivity Commission. They are also employed by accounting firms; management consultants, international agencies and agribusiness firms; the wider business community; large corporate farms; and in the media as economic journalists.

#### BACHELOR OF ENVIRONMENTAL SYSTEMS (BEnvSys)

**Assumed knowledge:** Mathematics and Chemistry

**Major studies:** Agricultural Systems, Natural Terrestrial Systems  
This course has a strong scientific base. It has a clear focus on building knowledge and skills in quantitative analysis across disciplines and the application of systems thinking to the issues of the day such as climate change, food security, water and carbon emissions. It is a unique degree that addresses the tensions and synergies of agricultural and natural terrestrial ecosystems. Core units will span across the plant sciences, hydrology, geomorphology, soil science and biosphere-atmosphere interactions.

**Professional Experience:** Not formally included in this degree.

**Career opportunities:** Examples include careers in sustainable agriculture and production in natural and managed environments, soil

science, ecology, environmental management and protection, catchment management, land and water conservation and hydrology.

**Additional information:** Ensuring ecologically-sustainable primary production in natural and managed terrestrial ecosystems is perhaps the single greatest challenge facing humankind. This degree focuses on building knowledge and skills in quantitative analysis across disciplines and the application of systems thinking to the issues of the day such as climate change (and flow-on effects such as drought and fire), food security, water and carbon emissions. It is a unique degree that addresses the tensions and synergies of agricultural and natural terrestrial ecosystems. Core units will span across the plant sciences, hydrology, geomorphology, soil science and biosphere-atmosphere interactions.

#### BACHELOR OF HORTICULTURAL SCIENCE (BHortSc)

The last intake of students for this degree occurred in 2009. No new students will be permitted to commence this degree.

*(Part-time study, during the daytime only, may be available in certain circumstances)*

**Assumed knowledge:** Mathematics, Chemistry and Biology.

The course has a strong scientific base. The focus of the degree is on the development of analytical, quantitative, computing and communication skills. Highly regarded skills are gained in the fourth year through the completion of a research thesis.

Production horticulture deals with the application of scientific and economic principles to all phases of the production, post-harvest care and marketing of fruit, vegetables, cut flowers and nursery stock. Urban/amenity horticulture deals with the horticultural and ecological aspects of the management of parks, sports fields and golf courses, as well as plantings for streets, etc. Environmental impact deals with habitat preservation and ex-situ conservation of rare and endangered species including their marketing; strategies for integrated management for control of pests, diseases and weeds; and environmental legislation and testing.

**Major studies:** Fruit, vegetable and ornamental production, post-harvest biology and technology, urban horticulture and horticultural specialisations within areas of agribusiness, biometry, biotechnology, chemistry, economics, entomology, genetics and plant breeding, plant pathology, resource economics and soil science.

**Professional experience:** For students enrolling since 2008, this professional experience requirement is credited to the AFNR4001 unit of study. Overseas experience is encouraged.

**Professional recognition:** Admission for professional membership by the Australian Society of Horticultural Science and the Australian Institute of Agricultural Science.

**Career opportunities:** Examples include employment in horticultural research, horticultural consultancy, management of horticultural enterprises and as horticultural advisers with private, state and local government bodies. Opportunities exist in production horticulture, post-harvest technology, urban/amenity horticulture, sustainable horticulture, horticultural biotechnology, precision horticulture, viticulture, environmental impact analysis, endangered species conservation, habitat preservation, ornamental plant breeding for the world market, crop protection, plant ecology and irrigation science.



### **BACHELOR OF LAND AND WATER SCIENCE (BLWSc)**

The last intake of students for this degree occurred in 2009. No new students will be permitted to commence this degree.

*(Part-time study, during the daytime only, may be available in certain circumstances)*

**Assumed knowledge:** Mathematics, Chemistry and Biology.

The course has a strong scientific base. The focus of this four-year applied degree is on the development of analytical, quantitative, computing and communication skills. Students learn how to apply the knowledge and principles of science to the understanding, management and conservation of our land and water resources. Highly regarded skills are gained in the fourth year through the completion of a research thesis.

**Major studies:** Include basic and applied aspects of biology, chemistry, geography, geographic information systems, geology, hydrology, soil science, statistics, sustainable agriculture and resource economics relevant to land and water science.

**Professional Experience:** For students enrolling since 2008, this professional experience requirement is credited to the AFNR4001 unit of study.

**Professional recognition:** Graduates are eligible for membership of professional societies including the International Association of Hydrogeologists and Australian Society of Soil Science Inc.

**Career opportunities:** Examples include technical experts and researchers in catchment management organisations, sustainable land and water management, environmental assessment, remediation and protection, landcare, environmental consultants, media researchers and journalists, national parks and wildlife services, educators.

### **BACHELOR OF RESOURCE ECONOMICS (BResEc)**

*(Part-time study, during the daytime only, may be available in certain circumstances)*

**Assumed knowledge:** Extension 1 Mathematics.

**Major studies:** Resource economics, economics, environmental economics, fishery economics, mineral and energy economics, water and land economics, agricultural science, commercial law, finance, geography, geology, government, marine science, mathematics, soil science and statistics.

**Professional Experience:** For students enrolling since 2008, this professional experience requirement is credited to the AFNR4001 unit of study. Overseas experience is encouraged.

**Professional recognition:** Graduates and undergraduates are eligible for membership of the Australian Agricultural and Resource Economics Society, the Economic Society of Australia, the Australia and New Zealand Society of Ecological Economics, the Australian Institute of Agricultural Science and Technology and the American Agricultural Economics Association.

**Career opportunities:** Include environmental consulting firms, "green" organisations, mining and energy companies. State and Federal government opportunities include environmental agencies, land and water departments, agriculture departments, fisheries and forestry authorities. Economic analysis skills are transferable, allowing employment as economists in any sector of the economy.

**Additional information:** BResEc is a unique applied economics degree, blending a basic science foundation with a strong disciplinary base in economics. All students will take units of basic science, complete sequences in economics, resource economics, and quantitative analytical economics; undertake electives in economics and/or science; and examine a wide range of natural resource

management problems. Students will specialise in and complete a research project in a selected area of resource economics.

The focus is on developing broadly applicable analytical economic skills complemented with an adequate knowledge of ecological and other natural resource systems and skills in modelling those systems in order to contribute to the solution of challenging environmental and management problems.

The course is targeted at students interested in economic management of natural resources systems, environmental economics, fishery and forestry economics, ecosystems, conservation issues, and sustainability.

### **BACHELOR OF SCIENCE IN AGRICULTURE (BScAgr)**

*(Part-time study, during the daytime only, may be available in certain circumstances)*

**Assumed knowledge:** Mathematics, Chemistry and Biology.

The course has a strong scientific base and offers a broad training in the scientific disciplines. The focus of this four-year applied degree is on the development of analytical, quantitative, computing and communication skills. Students learn how to apply the knowledge and principles of science to the understanding and management of the production and processing and marketing of agricultural products, and to the management and conservation of our natural resources. Highly regarded skills are gained in the fourth year through the completion of a research thesis.

**Major studies:** Agricultural economics, entomology, genetics, agricultural microbiology, agronomy, biometry, environmental chemistry, food science, livestock production, plant breeding, plant pathology, and soil science. Special interdisciplinary programs may also be approved in fourth year.

**Professional experience:** For students enrolling since 2008, this professional experience requirement is credited to the AFNR4001 unit of study.

**Professional recognition:** Membership of professional societies, such as the Australian Institute of Agricultural Science, is available.

**Career opportunities:** Examples include environmental scientists or research scientists in environmental protection, land and water conservation, conservation of endangered species, sustainable agriculture, precision agriculture, plant breeding, horticulture, agronomy, integrated pest management, animal nutrition, and molecular genetics (plant, animal and human); medical researchers; reproductive technologists in animal production enterprises and IVF clinics; biotechnologists (plant, animal and microbial); microbiologists (industrial and environmental); food scientists and cereal chemists; feedlot managers, managers of large scale intensive and extensive animal production enterprises; agricultural consultants (domestic and international); statisticians; media researchers and journalists; personnel for biosoil programs, environmental protection groups, national parks and wildlife services and forestry commissions; educators; applied marketing and agribusiness management.

## **Progress through the years**

Under normal circumstances, the degree requirements may be satisfied in four years. If you fail to achieve a satisfactory standard in a unit of study at the first attempt, you may repeat the unit. Should you not achieve a satisfactory standard at the second attempt, you will be asked to show good cause or explain why you should be re-admitted to that unit of study and/or degree (see 'Satisfactory progress' in chapter 6). Students repeating units of study which belong to the first, second or third year groups of units of study may, with the permission of the faculty, enrol in one or more units of study prescribed for the next higher year. The faculty will normally grant permission for you to undertake units from the next year when:

1. the timetable arrangements are such that you can attend all lectures, practical classes, tutorials, seminars and excursions in all of the units of study undertaken
2. you have fulfilled all of the prerequisites, and
3. you can satisfy the corequisites for the units belonging to the higher year group of units.

Prerequisites are units of study which you must pass before proceeding to another unit.

Corequisites are units of study which should be studied in the same year as another unit if you have not already passed in them.

In the year groupings on the following pages, prerequisites and corequisites for each of the specified units of study are listed. There are circumstances, however, in which the faculty may waive the formal prerequisite and corequisite requirements if you are otherwise suitably qualified to enrol for a unit. The onus is on students to consult the various unit coordinators as to the waivers which may be granted for each unit. The approval of the degree coordinator must be obtained before you can proceed to a unit of study unless you have passed the necessary prerequisites.

## Bachelor of Agricultural Economics (BAgrEc)

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
All students complete an Agricultural Economics major and one non-Agricultural Economics major. Details of majors can be found in Tables 3 and 4.			
<b>Year 1</b>			
Year 1 will have a minimum of 48 credit points comprised of:			
<b>AGEC1101 Agricultural and Resource Systems</b>	6	<b>A</b> HSC Mathematics or HSC Mathematics Extension 1 <b>N</b> AGEC1001	Semester 2
<b>ECON1001 Introductory Microeconomics</b>	6	<b>A</b> Mathematics	Semester 1 Summer Main
<b>ECMT1010 Business and Economic Statistics A</b>	6	<b>N</b> ECMT1011, ECMT1012, ECMT1013, MATH1015, MATH1005, MATH1905, STAT1021, ECOF1010	Semester 1 Semester 2
<b>AGEC1102 Agricultural Economics 1</b>	6	<b>A</b> HSC Mathematics or HSC Mathematics Extension 1 <b>N</b> AGEC1002	Semester 1
<b>ECON1002 Introductory Macroeconomics</b>	6	<b>A</b> Mathematics	Semester 2 Summer Main
<b>ECMT1020 Business and Economic Statistics B</b>	6	<b>P</b> ECMT1010 or ECOF1010 <b>N</b> ECMT1021, ECMT1022, ECMT1023 <i>Other than in exceptional circumstances, it is strongly recommended that students do not undertake Business and Economic Statistics B before attempting Business and Economic Statistics A.</i>	Semester 1 Semester 2 Summer Main
and units from Table 1 (minimum of 12 credit points), with a view to completing a Table 4 non-AGEC major.			
<b>Year 2</b>			
<b>AGEC2103 Production Economics</b>	6	<b>P</b> AGEC1102 or AGEC1006 or (AGEC1003 and AGEC1004) or RSEC1031 <b>N</b> AGEC2003	Semester 1
<b>AGEC2105 Applied Econometric Modelling</b>	6	<b>P</b> (ECMT1010 and ECMT1020) or (MATH1001 and MATH1002 and MATH1003 and MATH1005) or BIOM1003 or RSEC1031 <b>N</b> AGEC2005	Semester 1
or			
<b>ECMT2110 Regression Modelling</b>	6	<b>P</b> ECMT1010 or ECOF1010 <b>N</b> ECMT2010	Semester 1 Semester 2
<b>ECOS2001 Intermediate Microeconomics</b>	6	<b>P</b> ECON1001 <b>C</b> ECMT1010 <b>N</b> ECON2001, ECOS2901, ECON2901 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 1 Semester 2 Summer Main
or			
<b>ECOS2901 Intermediate Microeconomics Honours</b>	6	<b>P</b> ECON1001 and ECON1002 with a Credit average or better in the two units of study combined <b>C</b> ECOS2903 and ECMT1010 <b>N</b> ECON2901, ECOS2001, ECON2001 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 1
<b>ECOS2002 Intermediate Macroeconomics</b>	6	<b>P</b> ECON1002 <b>C</b> ECMT1020 <b>N</b> ECON2002, ECOS2902, ECON2902 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 1 Semester 2 Summer Main
or			
<b>ECOS2902 Intermediate Macroeconomics Honours</b>	6	<b>P</b> ECON1001 and ECON1002 with a Credit average or better in the two units of study combined <b>C</b> ECMT1020 <b>N</b> ECON2902, ECOS2002, ECON2002 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 2
<b>AGEC2101 Market and Price Analysis</b>	6	<b>P</b> AGEC1102 or AGEC1006 or (AGEC1003 and AGEC1004) or RSEC1031 <b>N</b> AGEC2001	Semester 2
and units from Tables 1 and 2 (minimum 18 credit points), with a view to completing a Table 4 non-AGEC major.			
<b>Year 3</b>			
Year 3 will have a minimum of 48 credit points comprised of:			
<b>AGEC3103 Applied Optimisation</b>	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) <b>N</b> AGEC3101	Semester 1
<b>AGEC3102 Agricultural and Resource Policy</b>	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) <b>N</b> AGEC3002	Semester 1
<b>AGEC3104 Research Methods</b>	6	<b>P</b> AGEC2105 or ECMT2010 or ECMT2110 or AGEC2005 <b>N</b> AGEC3004	Semester 2
and units from Table 2 (minimum 30 credit points), such that an Economics major or other Table 4 non-AGEC major is completed.			
Notes: 1) AGEC 3001 and AGEC 3101 are both incompatible with AGEC1102. A student who takes AGEC1102 will take AGEC3103. A student who has taken AGEC1002 in lieu of AGEC 1102 must take either AGEC 3001 or AGEC 3101, and not AGEC 3103. 2) AGEC 3101 will not be available in the BAgrEc program after 2007.			
<b>Year 4</b>			
Year 4 will have a minimum of 48 credit points comprised of:			



<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>AGEC4112</b> Research Project A	9	<b>P</b> 2 units out of AGEC3102, AGEC3103, AGEC3104 or AGEC3004 <b>C</b> AGEC4113 <b>N</b> AGEC4012 <i>Note: Department permission required for enrolment</i> <i>Department permission required for enrolment.</i>	Semester 1
or			
<b>AGEC4121</b> Research Exercises A	9	<b>P</b> 2 units out of AGEC3102, AGEC3103, AGEC 3104 or AGEC3004 <b>C</b> AGEC4122 <b>N</b> AGEC4012, AGEC4112	Semester 1
and			
<b>AGEC4113</b> Research Project B	9	<b>P</b> 2 units out of AGEC3102, AGEC3103, AGEC3104 or AGEC3004 <b>C</b> AGEC4112 <b>N</b> AGEC4013 <i>Note: Department permission required for enrolment</i> <i>Department permission required for enrolment.</i>	Semester 2
or			
<b>AGEC4122</b> Research Exercises B	9	<b>P</b> 2 units out of AGEC3102, AGEC3103, AGEC 3104, or AGEC3004 <b>C</b> AGEC4121 <b>N</b> AGEC4013, AGEC4113	Semester 2
<b>AFNR4001</b> Professional Experience	6	<i>Note: Department permission required for enrolment</i>	Semester 2
and units from below (normally 24 credit points), with no more than 12 credit points of RSEC units. Not all of these units will be offered in all years.			
<b>AGEC4102</b> Agricultural Development Economics	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103)	Semester 2
<b>AGEC4104</b> Agribusiness Analysis	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103)	Semester 1
<b>AGEC4107</b> Special Topics	6	<b>N</b> AGEC4007 <i>Note: Department permission required for enrolment</i>	Semester 1 Semester 2
<b>AGEC4108</b> Quantitative Planning Methods	6	<b>P</b> AGEC3101 or AGEC3103 or AGEC3031 or AGEC3001 <b>N</b> AGEC4008	Semester 2
<b>RSEC4131</b> Benefit-Cost Analysis	6	<b>P</b> (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) <b>N</b> AGEC4037	Semester 1
<b>RSEC4132</b> Environmental Economics	6	<b>A</b> (ECON2001 or ECOS2001), (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 <b>P</b> ECON2001 or ECOS2001 or AGEC2103 or AGEC2003 <b>N</b> ECON3013, AGEC4035	Semester 1
<b>RSEC4133</b> Economics of Mineral & Energy Industries	6	<b>A</b> (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 <b>P</b> (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) <b>N</b> ECON3013	Semester 2
<b>RSEC4134</b> Economics of Water & Bio-resources <i>This unit of study is not available in 2010</i>	6	<b>A</b> (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 <b>P</b> (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) <b>N</b> ECON3013 <i>Only available to 4th year students in the FAFNR. Available to 3rd year students in the FEB. Available to students that have completed RSEC1031 or ENVI3013 with permission from the unit coordinator</i>	Semester 2

## 4. Undergraduate course requirements

Table 1 – BAgREc Years 1 and 2 elective units

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>ACCT1001</b> Accounting IA	6	<b>A</b> HSC Mathematics <b>N</b> ACCT1003, ACCT1004	Semester 1 Semester 2
<b>ACCT1002</b> Accounting IB	6	<b>P</b> ACCT1001 <b>N</b> ACCT1003, ACCT1004	Semester 1 Semester 2
<b>ACCT1003</b> Financial Accounting Concepts	6	<b>N</b> ACCT1001, ACCT1002 <i>Terminating unit.</i>	Semester 1
<b>ACCT1004</b> Management Accounting Concepts	6	<b>N</b> ACCT1001, ACCT1002 <i>Terminating unit.</i>	Semester 2
<b>AFNR1001</b> The Rural Environment	6		Semester 1
<b>AFNR1002</b> Climate and the Environment	6		Semester 2
<b>BIOL1001</b> Concepts in Biology	6	<b>A</b> None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL 1911 <i>It is recommended that BIOL (1001 or 1911) be taken concurrently with either BIOL1003 or BIOL1903. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.</i>	Semester 1 Summer Main
<b>BIOL1002</b> Living Systems	6	<b>A</b> HSC 2-unit Biology. Students who have not completed HSC biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL1902 <i>It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.</i>	Semester 2
<b>CLAW1001</b> Foundations of Business Law	6		Semester 1 Semester 2 Summer Early
<b>GEOS1001</b> Earth, Environment and Society	6	<b>N</b> GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902	Semester 1 Summer Late
<b>GEOS1002</b> Introductory Geography	6	<b>N</b> GEOS1902, GEOG1001, GEOG1002	Semester 2
<b>GOVT1101</b> Australian Politics	6		Semester 1
<b>GOVT1104</b> Power in Society	6		Semester 2
<b>GOVT1105</b> Geopolitics	6		Semester 1 Semester 2
<b>GOVT1202</b> World Politics	6		Semester 1 Semester 2
<b>INFS1000</b> Digital Business Innovation	6	<b>N</b> ISYS1003, INFO1000, INFO1003	Semester 1 Semester 2 Summer Late
<b>MATH1011</b> Applications of Calculus	3	<b>A</b> HSC Mathematics <b>N</b> MATH1111, MATH1001, MATH1901, MATH1906, BIOM1003	Semester 1 Summer Main
<b>MATH1013</b> Mathematical Modelling	3	<b>A</b> HSC Mathematics or MATH1111 <b>N</b> MATH1003, MATH1903, MATH1907	Semester 2 Summer Main
<b>MKTG1001</b> Marketing Principles	6	<b>N</b> MKTG2001	Semester 1 Semester 2
<b>MKTG1002</b> Marketing Research 1	6	<b>P</b> MKTG1001 (or MKTG2001) <b>N</b> MKTG2003	Semester 2
<b>PSYC1001</b> Psychology 1001	6		Semester 1 Summer Main
<b>PSYC1002</b> Psychology 1002	6		Semester 2 Summer Main
<b>WORK1003</b> Foundations of Work and Employment	6	<i>This is the compulsory unit of study for the Industrial Relations/Human Resource Management major.</i>	Semester 1 Semester 2
Modern Language (Level 1 or higher) units, with the approval of the Dean FAFNR			

## Notes:

- Students may count no more than 24 credit points of the units specified in the above table towards meeting the requirements of their degree, and no more than 12 credit points from the listed INFS, MATH, PSYC and Modern Language units.
- ACCT1001 and ACCT1003 are mutually exclusive.
- ACCT1002 and ACCT1004 are mutually exclusive.
- Entry to ACCT1001 and ACCT1002 is restricted: the student's academic record must be as good as that needed for admission to the University's BCom program.
- Prerequisites apply for many second semester units.

Table 2 – BAgREc Years 2 and 3 elective units

Unit of study	Credit points	A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition	Session
<b>AGEC2102</b> Agribusiness Marketing	6	P AGEC1006 or (AGEC1003 and AGEC1004) or AGEC1002 or AGEC1102 or RSEC1031 or AGEC1031	Semester 1
<b>HORT2002</b> Horticultural Science 2	6	A (AFNR1001 and AFNR1002) or (HORT1001 and HORT1002) P BIOL1001 and (BIOL1002 or BIOL1902)	Semester 2
<b>LWSC2002</b> Sustainable Land and Water Management	6	A AFNR1001, AFNR1002	Semester 2
<b>PLNT2002</b> Aust Flora: Ecology and Conservation	6	P 6 credit points of a Junior unit of study N PLNT2902	Semester 1
<b>PLNT2003</b> Plant Form and Function	6	A 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) N PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
<b>RSEC4131</b> Benefit-Cost Analysis	6	P (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) N AGEC4037	Semester 1
<b>SOIL2003</b> Soil Properties and Processes	6		Semester 1
<b>ENVX3001</b> Environmental GIS	6	A least 48 credit points in second year agriculture/science units.	Semester 1
Any level 2 or 3 semester units in Accounting (ACCT), Commercial Law (CLAW), Econometrics (ECMT), Economics (ECOS), Finance (FINC), Geography (GEOG or GEOS), Government (GOVT), Industrial Relations and Human Resource Management (WORK), Information Systems (INFS), Marketing (MKTG), Psychology (PSYC), Units in Asian Studies (ASNS) or Modern Languages may also be taken (with the approval of the Dean FAFNR)			
Any level 4 units in Agricultural Economics (AGEC) other than those which are core requirements for Year 4.			
Other units of study from the BScAgr, BHortSc and BLWSc degrees, with approval of the Dean FAFNR and the Degree Coordinator concerned.			
AGEC2102 Agribusiness Marketing can only be included for Year 2.			
Prerequisites and/or corequisites apply for most units.			
Electives must be chosen such that the student will complete a non-AGEC major as specified in the Table of Majors.			

### Majors in the BAgREc Degree

The definitions of majors in the following tables apply for students commencing in 2005 or later. These students are required to complete 48 credit points in their chosen majors. Their majors must comply with the requirements for the BAgREc degree as set out below, and also with the minimum requirements of the discipline teaching that major.

Students who commenced in 2004 or earlier will be required to complete 44 credit points to obtain a major. The major will be defined according to the criteria as currently determined by the discipline teaching that major. The current requirements for majors in the Faculty of Economics and Business and the Faculty of Science can be found in the respective faculty handbooks.

All students must complete an Agricultural Economics major and a non Agricultural Economics major. The Agricultural Economics major is defined in Table 3. The other majors available in the BAgREc degree are defined in Table 4. Up to three majors will be noted on a student's transcript.

Table 3 – Agricultural Economics major

Agricultural Economics
<b>Junior (Level 1) units</b> AGEC(1101 or 1001) AGEC(1102 or 1002) <b>Level 2 and 3 units</b> AGEC(2101 or 2001) and AGEC(2103 or 2003) AGEC(3002 or 3102) and AGEC(3001 or 3101 or 3103) Two level 4 AGEC elective units

Table 4 – Non AGEC majors available in the BAgREc Degree

Accounting
<b>Junior (Level 1) units</b> ACCT1001*, ACCT1002* <b>Level 2 and 3 units</b> ACCT2011 and ACCT2012 And four of the following units: ACCT3011, ACCT3012, ACCT3013, ACCT3014, ACCT3031, ACCT3032, CLAW2201 See FEB Handbook *Note: Restricted entry

Agribusiness
<b>Junior (Level 1) units</b> ACCT1004 and either (INFS1000 and CLAW1001) or WORK1003 <b>Level 2 and 3 units</b> AGEC2102 AGEC4104 One of AGEC4101, 4109 Either 12 credit points INFS level 2/3 units or 18 credit points WORK level 2/3 units

Agricultural Finance
<b>Junior (Level 1) units</b> ACCT1001* or ACCT1003 and either ECMT1010 or ECON1001 <b>Level 2 and 3 units</b> Two FINC2000 units as for a Finance major Two FINC3000 units AGEC4104, AGEC4108 *Note: Restricted entry

Agricultural Marketing
<b>Junior (Level 1) units</b> MKTG1001 MKTG1002 or AGEC3104 <b>Level 2 and 3 units</b> MKTG2112 and (MKTG3111 or MKTG3118) Two other MKTG3000 units AGEC4104

Agricultural Science
<b>Junior (Level 1) units</b> AFNR1001 and AFNR1002 <b>Level 2 and 3 units</b> PLNT2003, SOIL2003 Four other Level 2/3/4 Agricultural Science units of study

Commercial Law
<b>Junior (Level 1) units</b> CLAW1001 And any CLAW2000 or CLAW3000 unit of study <b>Level 2 and 3 units</b> CLAW2201 and any five further CLAW2000 or 3000 units See FEB Handbook

#### 4. Undergraduate course requirements

##### Econometrics

**Junior (Level 1) units**

ECMT1010 and ECMT1020

**Level 2 and 3 units**

ECMT2110 and ECMT3110

Four further ECMT2000 and ECMT3000 units

See FEB Handbook

##### Economics

**Junior (Level 1) units**

ECON1001 and ECON1002

**Level 2 and 3 units**

ECOS2001 and ECOS2002 Any four further ECOS2000 or ECON3000 or ECOS3000 units, of which at least two must be at the 3000 level.

See FEB Handbook

##### Finance

**Junior (Level 1) units**

ACCT1001\* or ACCT1003 and either ECMT1010 or ECON1001

**Level 2 and 3 units**

FINC2011 and FINC2012

Any four further FINC3000 units or three further FINC3000 units and one of ACCT3013 or CLAW3201.

See FEB Handbook

\*Note: Restricted entry

##### Geography

**Junior (Level 1) units**

GEOS1001 or GEOS1003

GEOS1002 or other level 1 science unit

**Level 2 and 3 units**

Two GEOG or GEOS2000 units

Four GEOG or GEOS3000 units

See FSc Handbook

##### Government and International Relations

**Junior (Level 1) units**

Two level 1000 Government (GOVT) units

**Level 2 and 3 units**

Six GOVT2000 units

See FEB Handbook

##### Management

**Junior (Level 1) units**

WORK1003

One GOVT1000 unit or ECON1001

**Level 2 and 3 units**

WORK2201

Five units from: ECOS3003, 3005, 3008, 3012, GOVT2552, 2557, WORK

2204, 2205, 2209, 2210, 2211, 2217, 2218, 2219, 2221

See FEB Handbook

##### Marketing

**Junior (Level 1) units**

MKTG1001 and MKTG1002

**Level 2 and 3 units**

MKTG2112 Four other MKTG2000 or 3000 units

See FEB Handbook

##### Psychology

**Junior (Level 1) units**

PSYC1001 and PSYC1002

**Level 2 and 3 units**

PSYC2011, 2012, 2013 and 2014

24 credit points PSYC3000 units

See FEB Handbook

\*Note: A Psychology major requires the completion of 60 credit points of PSYC units

##### Notes:

- For disciplines based in other faculties (e.g. Geography is based in the Faculty of Science) the specification of a major here may differ from that in its 'home' faculty. The requirement for a major within the BAgEc degree is no less, nor more liberal, than in the discipline's 'home' faculty.
- A student can count a particular unit of study towards only one major.
- Where a student could count a unit of study towards more than one major, the student must nominate by the end of their final year the particular major to which the unit is to be allocated.

## Bachelor of Environmental Systems (BEnvSys)

Unit of study	Credit points	A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition	Session
<b>Year 1</b>			
Year 1 will have the following 48 credit point structure:			
<b>BIOL1001</b> Concepts in Biology	6	<b>A</b> None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL 1911 <i>It is recommended that BIOL (1001 or 1911) be taken concurrently with either BIOL1003 or BIOL1903. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.</i>	Semester 1 Summer Main
or			
<b>BIOL1911</b> Concepts in Biology (Advanced)	6	<b>P</b> 80+ in HSC 2-unit Biology (or equivalent) or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL 1001 <i>Note: Department permission required for enrolment It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. The completion of MBLG1001 is highly recommended.</i>	Semester 1
<b>BIOM1003</b> Biometry 1	6	<b>A</b> 70 or more in HSC Mathematics	Semester 1
<b>CHEM1001</b> Fundamentals of Chemistry 1A	6	<b>A</b> There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. <b>N</b> CHEM1101, CHEM1901, CHEM1109, CHEM1903	Semester 1
or			
<b>CHEM1101</b> Chemistry 1A	6	<b>A</b> HSC Chemistry and Mathematics <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1109, CHEM1901, CHEM1903	Semester 1 Semester 2 Summer Main
or			
<b>CHEM1901</b> Chemistry 1A (Advanced)	6	<b>P</b> UAI (or ATAR equivalent) of at least 95 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1101, CHEM1109, CHEM1903 <i>Note: Department permission required for enrolment</i>	Semester 1
<b>ENSY1001</b> Australian Environments and Climate	6		Semester 1
<b>BIOL1002</b> Living Systems	6	<b>A</b> HSC 2-unit Biology. Students who have not completed HSC biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL1902 <i>It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.</i>	Semester 2
or			
<b>BIOL1902</b> Living Systems (Advanced)	6	<b>P</b> UAI (or ATAR equivalent) of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL1002 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>CHEM1002</b> Fundamentals of Chemistry 1B	6	<b>P</b> CHEM (1001 or 1101) or equivalent <b>N</b> CHEM1102, CHEM1108, CHEM1902, CHEM1904	Semester 2
or			
<b>CHEM1102</b> Chemistry 1B	6	<b>P</b> CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1108, CHEM1902, CHEM1904	Semester 1 Semester 2 Summer Main
or			
<b>CHEM1902</b> Chemistry 1B (Advanced)	6	<b>P</b> CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1102, CHEM1108, CHEM1904 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>ENSY1002</b> Ecological Sustainability	6		Semester 2
<b>RSEC1031</b> Resource Economics 1	6	<b>N</b> AGEC1031	Semester 2
<b>Year 2</b>			
Year 2 will have the following structure: 30 credit points of core units including:			
<b>ENVX2001</b> Applied Statistical Methods	6	<b>P</b> BIOM1003 or MATH1011 and MATH1015	Semester 1
<b>SOIL2003</b> Soil Properties and Processes	6		Semester 1
<b>ENVX3001</b> Environmental GIS	6	<b>A</b> least 48 credit points in second year agriculture/science units.	Semester 1
<b>PLNT2003</b> Plant Form and Function	6	<b>A</b> 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) <b>N</b> PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
and a new 6 credit point unit of study dealing with the perturbation of ecosystems, which will be introduced in Semester 2, 2011			

4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
and 18 credit points of elective units from either Table AS1 or Table NTS1			
<b>Table AS1 Agricultural Systems Stream</b>			
one of:			
<b>AGCH2003</b> Rural Environmental Chemistry	6	<b>P</b> 12 credit points of Junior Chemistry <b>N</b> AGCH2001, AGCH2002 and CHEM2404	Semester 1
<b>AGEC2103</b> Production Economics	6	<b>P</b> AGE1102 or AGE1006 or (AGE1003 and AGE1004) or RSEC1031 <b>N</b> AGE2003	Semester 1
<b>GENE2001</b> Agricultural Genetics 2	6	<b>P</b> At least one of (BIOL1001, BIOL1002, BIOL1101, BIOL1901, BIOL1911)	Semester 1
and two of:			
<b>AGEC2101</b> Market and Price Analysis	6	<b>P</b> AGE1102 or AGE1006 or (AGE1003 and AGE1004) or RSEC1031 <b>N</b> AGE2001	Semester 2
<b>AGRO3004</b> Managing Agro-Ecosystems	6	<b>A</b> AFNR1001, AFNR1002, SOIL2003, and BIOM1003 <b>P</b> PLNT2003 or PLNT2903	Semester 2
<b>ENTO2001</b> Agricultural Entomology	6		Semester 2
<b>ENVI2112</b> Atmospheric Processes and Climate	6	<b>P</b> 24 credit points of Junior Science units, including 12 credit points of Junior Chemistry or Physics <b>N</b> ENVI2002	Semester 2
<b>LWSC2002</b> Sustainable Land and Water Management	6	<b>A</b> AFNR1001, AFNR1002	Semester 2
<b>MICR2024</b> Microbes in the Environment	6	<b>P</b> 12 credit points of first year Biology <b>N</b> MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2021, MICR2921, MICR2909	Semester 2
<b>SOIL2004</b> The Soil Resource	6		Semester 2
<b>Table NTS1 Natural Terrestrial Systems Stream</b>			
one of:			
<b>AGCH2003</b> Rural Environmental Chemistry	6	<b>P</b> 12 credit points of Junior Chemistry <b>N</b> AGCH2001, AGCH2002 and CHEM2404	Semester 1
<b>ENVI2111</b> Conservation Biology and Applied Ecology	6	<b>P</b> BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). <b>N</b> ENVI2911, ENVI2001.	Semester 1
<b>GEOS2113</b> Making the Australian Landscape	6	<b>P</b> 24 credit points of Junior units of study, including GEOS1002 or GEOS1003 or GEOS1902 or GEOS1903 or GEOG1001 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 <b>N</b> GEOS2913	Semester 1
<b>PLNT2002</b> Aust Flora: Ecology and Conservation	6	<b>P</b> 6 credit points of a Junior unit of study <b>N</b> PLNT2902	Semester 1
and two of			
<b>ENVI2112</b> Atmospheric Processes and Climate	6	<b>P</b> 24 credit points of Junior Science units, including 12 credit points of Junior Chemistry or Physics <b>N</b> ENVI2002	Semester 2
<b>GEOG2321</b> Fluvial and Groundwater Geomorphology	6	<b>P</b> GEOG(2311 or 2001) or 36 credit points of Junior study including GEOS(1001 or 1901) or GEOG1001 or ENVI(1001 or 1002) or GEOL1501. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology (or Land and Water Science), Chemistry and Mathematics. Students in the Bachelor of Land and Water Science should have 6 credit points of Junior Geoscience, 12 credit points of Chemistry, 6 credit points of Biology, BIOM1002. <b>N</b> GEOG (2002 or 2302 or 2303) or MARS2002 or MARS2006	Semester 2
<b>LWSC2002</b> Sustainable Land and Water Management	6	<b>A</b> AFNR1001, AFNR1002	Semester 2
<b>MICR2024</b> Microbes in the Environment	6	<b>P</b> 12 credit points of first year Biology <b>N</b> MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2021, MICR2921, MICR2909	Semester 2
<b>SOIL2004</b> The Soil Resource	6		Semester 2
<b>Year 3</b>			
Year 3 will have the following structure: 24 credit points of core units including:			
<b>LWSC3005</b> Environmental Water Quality	6	<b>P</b> LWSC2002 or GEOG2321 or AGCH2003 or 6 credit points of intermediate Chemistry	Semester 1
<b>SOIL3009</b> Contemporary Field and Lab Soil Science	6	<b>P</b> SOIL2003	Semester 1
<b>PLNT3001</b> Plant, Cell and Environment	6	<b>P</b> 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent <b>N</b> PLNT3901	Semester 2
and a new 6 credit point unit of study dealing with biosphere-atmosphere interactions, which will be introduced in 2012			
and 24 credit points from either Table AS2 or Table NTS2			

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>Table AS2 Agricultural Systems Stream</b>			
two of:			
<b>AFNR3001</b> Agro-ecosystems in Developing Countries	6	<i>Note: Department permission required for enrolment</i>	S1 Intensive
<b>AGRO4003</b> Crop and Pasture Agronomy	6	P AGRO3004 or PLNT2003 or PLNT2903	Semester 1
<b>AGRO4004</b> Sustainable Farming Systems	6	P AGRO3004	Semester 1
<b>ENVI3111</b> Environmental Law and Ethics	6	A Intermediate Environmental Science. P 12 credit points of Intermediate Science or Agriculture units. N ENVI3001, ENVI3003.	Semester 1
<b>ENVX4002</b> Environmetrics 4	6	P BIOM3004 or BIOM3005 or BIOM3006 or ENVX3002	Semester 1
<b>LWSC3006</b> Landscape Hydrology and Management	6	A LWSC3005 P LWSC2002 or GEOG2321	Semester 1
<b>PPAT4005</b> Soil Biology	6	P MICR2024 or 6cp intermediate microbiology	Semester 1
<b>RSEC4131</b> Benefit-Cost Analysis	6	P (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) N AGEC4037	Semester 1
and a new 6 credit point unit of study dealing with agro-forestry, which will be introduced in 2012.			
and two of			
<b>ENVX3002</b> Statistics in the Natural Sciences	6	P ENVX2001 or BIOM2001 or STAT2012 or STAT2912	Semester 1
<b>ENVX4001</b> GIS, Remote Sensing and Land Management	6	A Some knowledge of GIS and spatial information systems and/or some knowledge of soil science, geomorphology or environmental science. <i>Note: Department permission required for enrolment Consent of the unit coordinator required.</i>	Semester 2
<b>PLNT3002</b> Plant Growth and Development	6	P 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent N PLNT3902, BIOL3021, BIOL3931	Semester 2
<b>RSEC4134</b> Economics of Water & Bio-resources <i>This unit of study is not available in 2010</i>	6	A (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 P (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) N ECON3013 <i>Only available to 4th year students in the FAFNR. Available to 3rd year students in the FEB. Available to students that have completed RSEC1031 or ENVI3013 with permission from the unit coordinator</i>	Semester 2
<b>SOIL3010</b> The Soil at Work	6	P SOIL2003 or SOIL2004	Semester 2
<b>Table NTS2 Natural Terrestrial Systems Stream</b>			
two of			
<b>BIOL3006</b> Ecological Methods	6	A BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). P 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. N BIOL3906, MARS3102	Semester 1
<b>ENVI3111</b> Environmental Law and Ethics	6	A Intermediate Environmental Science. P 12 credit points of Intermediate Science or Agriculture units. N ENVI3001, ENVI3003.	Semester 1
<b>ENVX4002</b> Environmetrics 4	6	P BIOM3004 or BIOM3005 or BIOM3006 or ENVX3002	Semester 1
<b>GEOS3018</b> Rivers: Science, Policy and Management	6	P (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geoscience) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) N GEOS3918	Semester 1
<b>LWSC3006</b> Landscape Hydrology and Management	6	A LWSC3005 P LWSC2002 or GEOG2321	Semester 1
<b>PLNT3003</b> Systematics and Evolution of Plants	6	P 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. N PLNT3903, BIOL3015/3915.	Semester 1
<b>PPAT4005</b> Soil Biology	6	P MICR2024 or 6cp intermediate microbiology	Semester 1
and a new 6 credit point unit of study dealing with fire ecology and management, which will be introduced in 2012			
and a new 6 credit point unit of study dealing with agro-forestry, which will be introduced in 2012			
and two of			
<b>AGCH3032</b> Land and Water Ecochemistry	6	P AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 N AGCH3030, AGCH3031	Semester 2
<b>BIOL3007</b> Ecology	6	A Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. P 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and ENVI2111 or MARS2006 ; or 12 credit points of MARS units, including MARS2006 N BIOL3907, MARS3102	Semester 2

#### 4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>BIOL3009</b> <b>Terrestrial Field Ecology</b>	6	<b>A</b> BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. <b>P</b> 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. <b>N</b> BIOL3909 <i>Note: One 6 day field trip held in the pre-semester break (18 - 23 July 2010), and 4 practical classes during weeks 1-4 in Semester 2.</i>	S2 Intensive
<b>ENVX3002</b> <b>Statistics in the Natural Sciences</b>	6	<b>P</b> ENVX2001 or BIOM2001 or STAT2012 or STAT2912	Semester 1
<b>ENVI3112</b> <b>Environmental Assessment</b>	6	<b>A</b> Intermediate Environmental Science. <b>P</b> 12 credit points of Intermediate Science or Agriculture units. <b>N</b> ENVI3002, ENVI3004.	Semester 2
<b>GEOS3015</b> <b>Environmental Geomorphology</b>	6	<b>A</b> Intermediate geomorphology/ physical geography/ geology. <b>P</b> 24 credit points of Intermediate units, including 6 credit points of Intermediate Geoscience <b>N</b> GEOS3915	Semester 2
<b>PLNT3002</b> <b>Plant Growth and Development</b>	6	<b>P</b> 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent <b>N</b> PLNT3902, BIOL3021, BIOL3931	Semester 2

New Units of Study covering perturbations of ecosystems (introduced in 2011), biosphere-atmosphere interactions (introduced in 2012), agro-forestry (introduced in 2012), and fire ecology and management (introduced in 2012), will be progressively introduced as the first cohort of BEnvSys students move through the degree.



## Bachelor of Horticultural Science (BHortSc)

<i>Unit of study</i>	<i>Credit points</i>	<i>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</i>	<i>Session</i>
<b>Year 2</b>			
Year 2 will have the following 48 credit point structure:			
<b>ENVX2001</b> Applied Statistical Methods	6	<b>P</b> BIOM1003 or MATH1011 and MATH1015	Semester 1
<b>PLNT2001</b> Plant Biochemistry and Molecular Biology	6	<b>P</b> 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) <b>N</b> PLNT2901, AGCH2001	Semester 1
or			
<b>PLNT2901</b> Plant Biochem & Molecular Biology (Adv)	6	<b>P</b> A Distinction average in 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) <b>N</b> PLNT2001, AGCH2001	Semester 1
<b>PLNT2002</b> Aust Flora: Ecology and Conservation	6	<b>P</b> 6 credit points of a Junior unit of study <b>N</b> PLNT2902	Semester 1
or			
<b>PLNT2902</b> Aust Flora: Ecology & Conservation (Adv)	6	<b>A</b> The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading <b>P</b> Distinction average in 6 credit points of Junior units of study <b>N</b> PLNT2002	Semester 1
<b>SOIL2003</b> Soil Properties and Processes	6		Semester 1
<b>ENTO2001</b> Agricultural Entomology	6		Semester 2
<b>HORT2002</b> Horticultural Science 2	6	<b>A</b> (AFNR1001 and AFNR1002) or (HORT1001 and HORT1002) <b>P</b> BIOL1001 and (BIOL1002 or BIOL1902)	Semester 2
Note: HORT2002 Horticultural Science 2 will not be offered in 2011.			
<b>MICR2024</b> Microbes in the Environment	6	<b>P</b> 12 credit points of first year Biology <b>N</b> MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2021, MICR2921, MICR2909	Semester 2
<b>PLNT2003</b> Plant Form and Function	6	<b>A</b> 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) <b>N</b> PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
or			
<b>PLNT2903</b> Plant Form and Function (Advanced)	6	<b>A</b> 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) <b>N</b> PLNT2003, BIOL2003, BIOL2903, CROP2001	Semester 2
<b>Year 3*</b>			
Year 3 will have the following structure: a core (30 credit points) of:			
<b>HORT3005</b> Production Horticulture	6	<b>A</b> AFNR1001, AFNR1002 and HORT2002 <b>P</b> Two of PLNT2001, PLNT2901, PLNT2002, PLNT2902, PLNT2003, PLNT2903	Semester 1
<b>GENE2001</b> Agricultural Genetics 2	6	<b>P</b> At least one of (BIOL1001, BIOL1002, BIOL1101, BIOL1901, BIOL1911)	Semester 1
<b>PPAT3003</b> Plant Disease	6	<b>P</b> MICR2024	Semester 1
<b>PLNT3002</b> Plant Growth and Development	6	<b>P</b> 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent <b>N</b> PLNT3902, BIOL3021, BIOL3931	Semester 2
or			
<b>PLNT3902</b> Plant Growth and Development (Advanced)	6	<b>P</b> 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent. These requirements may be varied and students with lower averages should consult the unit Executive Officer. <b>N</b> PLNT3002, BIOL3021, BIOL3931	Semester 2
<b>PLNT3001</b> Plant, Cell and Environment	6	<b>P</b> 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent <b>N</b> PLNT3901	Semester 2
or			
<b>PLNT3901</b> Plant, Cell and Environment (Advanced)	6	<b>P</b> 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent with average grade of distinction <b>N</b> PLNT3001 <i>Note: Department permission required for enrolment</i>	Semester 2
And three electives (18 credit points) from Table A			
<b>Year 4*</b>			
Year 4 will have the following structure: a core (42 credit points) of:			
<b>AFNR4101</b> Research Project A	12	<b>P</b> 144 credit points of level 1000-3000 units of study	Semester 1
<b>HORT4004</b> Issues in Horticultural Science 4A	6	<b>P</b> HORT3001 or HORT3004	Semester 1

## 4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>AFNR4001</b> Professional Experience	6	Note: Department permission required for enrolment	Semester 2
<b>AFNR4102</b> Research Project B	12	P AFNR4101	Semester 2
<b>HORT4005</b> Research and Practice in Hort Science	6	P HORT3005	Semester 2
and one elective from Table A.			
* A student may apply to the degree coordinator for permission to enrol in up to one (6 cp) elective University of Sydney unit of study in year 3 and up to one (6 cp) University of Sydney unit of study in year 4 which is not listed in Table A. The application must (1) be made prior to enrolment in the unit (2) be submitted with a written academic justification for enrolment by the student and (3) be submitted with written approval of the relevant unit of study coordinator.			
<b>Table A</b>			
Agribusiness			
<b>AGEC2102</b> Agribusiness Marketing	6	P AGEC1006 or (AGEC1003 and AGEC1004) or AGEC1002 or AGEC1102 or RSEC1031 or AGEC1031	Semester 1
<b>AGEC3101</b> Agribusiness Management	6	P AGEC2103 or AGEC2003 or AGEC1006 or (AGEC1003 and AGEC1004) N AGEC1102; AGEC3103; AGEC3001	Semester 2
Food Science			
<b>AGCH3025</b> Chemistry and Biochemistry of Foods	6	P AGCH2003 or AGCH2004 or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 or 6 credit points of Intermediate units in Chemistry N AFNR5102	Semester 1
<b>AGCH3026</b> Food Biotechnology	6	P AGCH2003 or AGCH2004 or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 or 6 credit points of Intermediate units in Chemistry C AGCH3025 N AFNR5103	Semester 1
Environmental Science			
<b>AGCH3032</b> Land and Water Ecochemistry	6	P AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 N AGCH3030, AGCH3031	Semester 2
Note: Department permission will be required for enrolment in AGCH3032			
Agronomy			
<b>AGRO3004</b> Managing Agro-Ecosystems	6	A AFNR1001, AFNR1002, SOIL2003, and BIOM1003 P PLNT2003 or PLNT2903	Semester 2
Entomology			
<b>ENTO4004</b> Insect Taxonomy and Systematics	6	P ENTO2001 or ENTO2002 or BIOL2017 or BIOL2917 (Note: BIOL2017/BIOL2917 are only for the BSc students who elect to take this unit of study)	Semester 1
<b>ENTO4003</b> Integrated Pest Management	6	P ENTO2001 or ENTO2002 or BIOL2017 or BIOL2917 (Note: BIOL2017/BIOL2917 are only for BSc students who elect to take this UoS)	Semester 2
Environmetrics			
<b>ENVX3002</b> Statistics in the Natural Sciences	6	P ENVX2001 or BIOM2001 or STAT2012 or STAT2912	Semester 1
Plant Pathology			
<b>BIOL3017</b> Fungi in the Environment	6	P 12 credit points of Intermediate Biology or Plant Science, or 6 credit points of Intermediate Biology, or Plant Science, and 6 Intermediate credit points of either Microbiology or Geography. N BIOL3917 Dates: 15-26 February 2010. The completion of 6 credit points of MBLG units is highly recommended.	S1 Intensive
or			
<b>BIOL3917</b> Fungi in the Environment (Advanced)	6	P Distinction average in 12 credit points of Intermediate Biology and Plant Science, or 6 credit points of Intermediate Biology, or Plant Science, and 6 Intermediate credit points of either Microbiology or Geography. N BIOL3017 The completion of 6 credit points of MBLG units is highly recommended.	S1 Intensive
<b>PPAT4004</b> Advanced Mycology and Plant Pathology	6	P PPAT3003 or BIOL3017	Semester 1
<b>PPAT4005</b> Soil Biology	6	P MICR2024 or 6cp intermediate microbiology	Semester 1
Plant Sciences			
<b>PLNT3003</b> Systematics and Evolution of Plants	6	P 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. N PLNT3903, BIOL3015/3915.	Semester 1
or			
<b>PLNT3903</b> Systematics and Evolution of Plants Adv	6	P Distinction average in 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. N PLNT3003, BIOL3015/3915.	Semester 1
Soil Science			
<b>SOIL3009</b> Contemporary Field and Lab Soil Science	6	P SOIL2003	Semester 1
<b>SOIL2004</b> The Soil Resource	6		Semester 2
<b>SOIL3010</b> The Soil at Work	6	P SOIL2003 or SOIL2004	Semester 2

## Bachelor of Land and Water Science (BLWSc)

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>Year 2</b>			
Year 2 will have the following 48 credit point structure:			
<b>AGCH2003</b> Rural Environmental Chemistry	6	<b>P</b> 12 credit points of Junior Chemistry <b>N</b> AGCH2001, AGCH2002 and CHEM2404	Semester 1
<b>ENVX2001</b> Applied Statistical Methods	6	<b>P</b> BIOM1003 or MATH1011 and MATH1015	Semester 1
<b>PLNT2002</b> Aust Flora: Ecology and Conservation	6	<b>P</b> 6 credit points of a Junior unit of study <b>N</b> PLNT2902	Semester 1
or			
<b>PLNT2902</b> Aust Flora: Ecology & Conservation (Adv)	6	<b>A</b> The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading <b>P</b> Distinction average in 6 credit points of Junior units of study <b>N</b> PLNT2002	Semester 1
<b>SOIL2003</b> Soil Properties and Processes	6		Semester 1
<b>GEOG2321</b> Fluvial and Groundwater Geomorphology	6	<b>P</b> GEOG(2311 or 2001) or 36 credit points of Junior study including GEOS(1001 or 1901) or GEOG1001 or ENVI(1001 or 1002) or GEOL1501. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology (or Land and Water Science), Chemistry and Mathematics. Students in the Bachelor of Land and Water Science should have 6 credit points of Junior Geoscience, 12 credit points of Chemistry, 6 credit points of Biology, BIOM1002. <b>N</b> GEOG (2002 or 2302 or 2303) or MARS2002 or MARS2006	Semester 2
<b>LWSC2002</b> Sustainable Land and Water Management	6	<b>A</b> AFNR1001, AFNR1002	Semester 2
<b>MICR2024</b> Microbes in the Environment	6	<b>P</b> 12 credit points of first year Biology <b>N</b> MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2021, MICR2921, MICR2909	Semester 2
<b>PLNT2003</b> Plant Form and Function	6	<b>A</b> 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) <b>N</b> PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
or			
<b>PLNT2903</b> Plant Form and Function (Advanced)	6	<b>A</b> 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) <b>N</b> PLNT2003, BIOL2003, BIOL2903, CROP2001	Semester 2
<b>Year 3*</b>			
Year 3 will have a core (24 credit points) of:			
<b>LWSC3005</b> Environmental Water Quality	6	<b>P</b> LWSC2002 or GEOG2321 or AGCH2003 or 6 credit points of intermediate Chemistry	Semester 1
<b>ENVX3001</b> Environmental GIS	6	<b>A</b> least 48 credit points in second year agriculture/science units.	Semester 1
<b>ENVX3002</b> Statistics in the Natural Sciences	6	<b>P</b> ENVX2001 or BIOM2001 or STAT2012 or STAT2912	Semester 1
<b>SOIL2004</b> The Soil Resource	6		Semester 2
And 24 credit points selected from Table B.			
<b>Year 4*</b>			
In Year 4 students will complete:			
<b>AFNR4101</b> Research Project A	12	<b>P</b> 144 credit points of level 1000-3000 units of study	Semester 1
<b>LWSC3006</b> Landscape Hydrology and Management	6	<b>A</b> LWSC3005 <b>P</b> LWSC2002 or GEOG2321	Semester 1
<b>SOIL3009</b> Contemporary Field and Lab Soil Science	6	<b>P</b> SOIL2003	Semester 1
<b>AFNR4001</b> Professional Experience	6	<i>Note: Department permission required for enrolment</i>	Semester 2
<b>AFNR4102</b> Research Project B	12	<b>P</b> AFNR4101	Semester 2
And one unit of study from Table C.			
* A student may apply to the degree coordinator for permission to enrol in up to one (6 cp) elective University of Sydney unit of study in year 3 and up to one (6 cp) University of Sydney unit of study in year 4 which is not listed in Tables B or C. The application must (1) be made prior to enrolment in the unit (2) be submitted with a written academic justification for enrolment by the student and (3) be submitted with written approval of the relevant unit of study coordinator.			
<b>Table B</b>			
Agricultural Chemistry			
<b>AGCH3032</b> Land and Water Ecochemistry	6	<b>P</b> AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 <b>N</b> AGCH3030, AGCH3031	Semester 2

## 4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
Note: Department permission will be required for enrolment in AGCH3032			
Agricultural Economics			
<b>AGEC3101 Agribusiness Management</b>	6	<b>P</b> AGEC2103 or AGEC2003 or AGEC1006 or (AGEC1003 and AGEC1004) <b>N</b> AGEC1102; AGEC3103; AGEC3001	Semester 2
<b>AGEC2101 Market and Price Analysis</b>	6	<b>P</b> AGEC1102 or AGEC1006 or (AGEC1003 and AGEC1004) or RSEC1031 <b>N</b> AGEC2001	Semester 2
<b>AGEC3102 Agricultural and Resource Policy</b>	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) <b>N</b> AGEC3002	Semester 1
Agronomy			
<b>AGRO3004 Managing Agro-Ecosystems</b>	6	<b>A</b> AFNR1001, AFNR1002, SOIL2003, and BIOM1003 <b>P</b> PLNT2003 or PLNT2903	Semester 2
Geography/Science			
<b>GEOS3018 Rivers: Science, Policy and Management</b>	6	<b>P</b> (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geoscience) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) <b>N</b> GEOS3918	Semester 1
<b>ENVI3111 Environmental Law and Ethics</b>	6	<b>A</b> Intermediate Environmental Science. <b>P</b> 12 credit points of Intermediate Science or Agriculture units. <b>N</b> ENVI3001, ENVI3003.	Semester 1
<b>ENVI3112 Environmental Assessment</b>	6	<b>A</b> Intermediate Environmental Science. <b>P</b> 12 credit points of Intermediate Science or Agriculture units. <b>N</b> ENVI3002, ENVI3004.	Semester 2
Plant Science			
<b>PLNT3003 Systematics and Evolution of Plants</b>	6	<b>P</b> 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. <b>N</b> PLNT3903, BIOL3015/3915.	Semester 1
<b>PLNT3001 Plant, Cell and Environment</b>	6	<b>P</b> 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent <b>N</b> PLNT3901	Semester 2
or			
<b>PLNT3901 Plant, Cell and Environment (Advanced)</b>	6	<b>P</b> 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent with average grade of distinction <b>N</b> PLNT3001 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>PLNT3002 Plant Growth and Development</b>	6	<b>P</b> 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent <b>N</b> PLNT3902, BIOL3021, BIOL3931	Semester 2
<b>Table C</b>			
Agricultural Chemistry			
<b>AGCH4007 Instrumentation in Analytical Chemistry</b>	6	<b>P</b> PLNT2001 or PLNT2901 or AGCH2003 or AGCH2004	Semester 1
Agronomy			
<b>AGRO4003 Crop and Pasture Agronomy</b>	6	<b>P</b> AGRO3004 or PLNT2003 or PLNT2903	Semester 1
<b>AGRO4004 Sustainable Farming Systems</b>	6	<b>P</b> AGRO3004	Semester 1
Ecology			
<b>PLNT3003 Systematics and Evolution of Plants</b>	6	<b>P</b> 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. <b>N</b> PLNT3903, BIOL3015/3915.	Semester 1
<b>BIOL3009 Terrestrial Field Ecology</b>	6	<b>A</b> BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. <b>P</b> 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. <b>N</b> BIOL3909 <i>Note: One 6 day field trip held in the pre-semester break (18 - 23 July 2010), and 4 practical classes during weeks 1-4 in Semester 2.</i>	S2 Intensive
Environmetrics			
<b>ENVX4002 Environmetrics 4</b>	6	<b>P</b> BIOM3004 or BIOM3005 or BIOM3006 or ENVX3002	Semester 1
GIS			
<b>ENVX4001 GIS, Remote Sensing and Land Management</b>	6	<b>A</b> Some knowledge of GIS and spatial information systems and/or some knowledge of soil science, geomorphology or environmental science. <i>Note: Department permission required for enrolment Consent of the unit coordinator required.</i>	Semester 2
Resource Economics			
<b>RSEC4131 Benefit-Cost Analysis</b>	6	<b>P</b> (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) <b>N</b> AGEC4037	Semester 1
<b>RSEC4132 Environmental Economics</b>	6	<b>A</b> (ECON2001 or ECOS2001), (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 <b>P</b> ECON2001 or ECOS2001 or AGEC2103 or AGEC2003 <b>N</b> ECON3013, AGEC4035	Semester 1
Soil Science			
<b>PPAT4005 Soil Biology</b>	6	<b>P</b> MICR2024 or 6cp intermediate microbiology	Semester 1

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<i>Unit of study</i>	<i>Credit points</i>	<i>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</i>	<i>Session</i>
SOIL3010 The Soil at Work	6	P SOIL2003 or SOIL2004	Semester 2

## Bachelor of Resource Economics (BResEc)

Unit of study	Credit points	A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition	Session
<b>Year 1</b>			
Year 1 will have a minimum of 48 credit points comprised of:			
<b>ECON1001</b> Introductory Microeconomics	6	<b>A</b> Mathematics	Semester 1 Summer Main
<b>AFNR1001</b> The Rural Environment	6		Semester 1
or			
<b>BIOL1001</b> Concepts in Biology	6	<b>A</b> None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL 1911 <i>It is recommended that BIOL (1001 or 1911) be taken concurrently with either BIOL1003 or BIOL1903. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.</i>	Semester 1 Summer Main
or			
<b>BIOL1911</b> Concepts in Biology (Advanced)	6	<b>P</b> 80+ in HSC 2-unit Biology (or equivalent) or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL 1001 <i>Note: Department permission required for enrolment</i> <i>It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. The completion of MBLG1001 is highly recommended.</i>	Semester 1
or			
<b>CHEM1001</b> Fundamentals of Chemistry 1A	6	<b>A</b> There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. <b>N</b> CHEM1101, CHEM1901, CHEM1109, CHEM1903	Semester 1
or			
<b>CHEM1101</b> Chemistry 1A	6	<b>A</b> HSC Chemistry and Mathematics <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1109, CHEM1901, CHEM1903	Semester 1 Semester 2 Summer Main
or			
<b>CHEM1901</b> Chemistry 1A (Advanced)	6	<b>P</b> UAI (or ATAR equivalent) of at least 95 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1101, CHEM1109, CHEM1903 <i>Note: Department permission required for enrolment</i>	Semester 1
<b>MATH1001</b> Differential Calculus	3	<b>A</b> HSC Mathematics Extension 1 <b>N</b> MATH1011, MATH1901, MATH1906, MATH1111	Semester 1 Summer Main
or			
<b>MATH1901</b> Differential Calculus (Advanced)	3	<b>P</b> HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. <b>N</b> MATH1111, MATH1011, MATH1001, MATH1906	Semester 1
<b>MATH1002</b> Linear Algebra	3	<b>A</b> HSC Mathematics Extension 1 <b>N</b> MATH1902, MATH1012, MATH1014	Semester 1 Summer Main
or			
<b>MATH1902</b> Linear Algebra (Advanced)	3	<b>P</b> HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. <b>N</b> MATH1002, MATH1012, MATH1014	Semester 1
<b>ECON1002</b> Introductory Macroeconomics	6	<b>A</b> Mathematics	Semester 2 Summer Main
<b>AFNR1002</b> Climate and the Environment	6		Semester 2
or			
<b>BIOL1002</b> Living Systems	6	<b>A</b> HSC 2-unit Biology. Students who have not completed HSC biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL1902 <i>It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.</i>	Semester 2
or			
<b>BIOL1902</b> Living Systems (Advanced)	6	<b>P</b> UAI (or ATAR equivalent) of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL1002 <i>Note: Department permission required for enrolment</i>	Semester 2
or			
<b>CHEM1002</b> Fundamentals of Chemistry 1B	6	<b>P</b> CHEM (1001 or 1101) or equivalent <b>N</b> CHEM1102, CHEM1108, CHEM1902, CHEM1904	Semester 2
or			
<b>CHEM1102</b> Chemistry 1B	6	<b>P</b> CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1108, CHEM1902, CHEM1904	Semester 1 Semester 2 Summer Main
or			

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>CHEM1902</b> <b>Chemistry 1B (Advanced)</b>	6	<b>P</b> CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1102, CHEM1108, CHEM1904 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>MATH1003</b> <b>Integral Calculus and Modelling</b>	3	<b>A</b> HSC Mathematics Extension 2 or MATH1001 or MATH1011 or MATH1111 <b>N</b> MATH1013, MATH1903, MATH1907	Semester 2 Summer Main
or			
<b>MATH1903</b> <b>Integral Calculus and Modelling</b> <b>Advanced</b>	3	<b>A</b> HSC Mathematics Extension 2 or Credit or better in MATH1001 or MATH1901 <b>P</b> HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. <b>N</b> MATH1003, MATH1013, MATH1907	Semester 2
<b>MATH1005</b> <b>Statistics</b>	3	<b>A</b> HSC Mathematics <b>N</b> MATH1015, MATH1905, STAT1021, STAT1022, ECMT1010	Semester 2 Summer Main
or			
<b>MATH1905</b> <b>Statistics (Advanced)</b>	3	<b>P</b> HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. <b>N</b> MATH1015, MATH1005, STAT1021, STAT1022, ECMT1010	Semester 2
or			
<b>ECMT1020</b> <b>Business and Economic Statistics B</b>	6	<b>P</b> ECMT1010 or ECOF1010 <b>N</b> ECMT1021, ECMT1022, ECMT1023 <i>Other than in exceptional circumstances, it is strongly recommended that students do not undertake Business and Economic Statistics B before attempting Business and Economic Statistics A.</i>	Semester 1 Semester 2 Summer Main
<b>RSEC1031</b> <b>Resource Economics 1</b>	6	<b>N</b> AGEC1031	Semester 2
And units from Table RE1 (a minimum of 6 credit points)			
Note: The second core science unit must be taken in the same discipline as the first core science unit.			
<b>Year 2</b>			
Year 2 will have a minimum of 48 credit points comprised of:			
<b>AGEC2103</b> <b>Production Economics</b>	6	<b>P</b> AGEC1102 or AGEC1006 or (AGEC1003 and AGEC1004) or RSEC1031 <b>N</b> AGEC2003	Semester 1
<b>AGEC2105</b> <b>Applied Econometric Modelling</b>	6	<b>P</b> (ECMT1010 and ECMT1020) or (MATH1001 and MATH1002 and MATH1003 and MATH1005) or BIOM1003 or RSEC1031 <b>N</b> AGEC2005	Semester 1
or			
<b>ECMT2110</b> <b>Regression Modelling</b>	6	<b>P</b> ECMT1010 or ECOF1010 <b>N</b> ECMT2010	Semester 1 Semester 2
<b>GEOS2113</b> <b>Making the Australian Landscape</b>	6	<b>P</b> 24 credit points of Junior units of study, including GEOS1002 or GEOS1003 or GEOS1902 or GEOS1903 or GEOG1001 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 <b>N</b> GEOS2913	Semester 1
<b>ECOS2001</b> <b>Intermediate Microeconomics</b>	6	<b>P</b> ECON1001 <b>C</b> ECMT1010 <b>N</b> ECON2001, ECOS2901, ECON2901 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 1 Semester 2 Summer Main
or			
<b>ECOS2901</b> <b>Intermediate Microeconomics</b> <b>Honours</b>	6	<b>P</b> ECON1001 and ECON1002 with a Credit average or better in the two units of study combined <b>C</b> ECOS2903 and ECMT1010 <b>N</b> ECON2901, ECOS2001, ECON2001 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 1
<b>ECOS2002</b> <b>Intermediate Macroeconomics</b>	6	<b>P</b> ECON1002 <b>C</b> ECMT1020 <b>N</b> ECON2002, ECOS2902, ECON2902 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 1 Semester 2 Summer Main
or			
<b>ECOS2902</b> <b>Intermediate Macroeconomics</b> <b>Honours</b>	6	<b>P</b> ECON1001 and ECON1002 with a Credit average or better in the two units of study combined <b>C</b> ECMT1020 <b>N</b> ECON2902, ECOS2002, ECON2002 <i>Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.</i>	Semester 2
<b>AGEC2101</b> <b>Market and Price Analysis</b>	6	<b>P</b> AGEC1102 or AGEC1006 or (AGEC1003 and AGEC1004) or RSEC1031 <b>N</b> AGEC2001	Semester 2
And units from Tables RE1 and RE2 (normally a minimum of 12 credit points)			
<b>Year 3</b>			
Year 3 will have a minimum of 48 credit points comprised of:			
<b>ENVI3111</b> <b>Environmental Law and Ethics</b>	6	<b>A</b> Intermediate Environmental Science. <b>P</b> 12 credit points of Intermediate Science or Agriculture units. <b>N</b> ENVI3001, ENVI3003.	Semester 1
<b>AGEC3102</b> <b>Agricultural and Resource Policy</b>	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) <b>N</b> AGEC3002	Semester 1
<b>AGEC3103</b> <b>Applied Optimisation</b>	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) <b>N</b> AGEC3101	Semester 1

4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>AGEC3104 Research Methods</b>	6	<b>P</b> AGEC2105 or ECMT2010 or ECMT2110 or AGEC2005 <b>N</b> AGEC3004	Semester 2
Economics level 3 ECOS3000 unit (6 credit points)			
Level 2/3 Faculty of Economics and Business unit (6 credit points)			
And units from Table RE2 (normally a minimum of 12 credit points)			
<b>Year 4</b>			
Year 4 will have a minimum of 48 credit points comprised of:			
<b>RSEC4131 Benefit-Cost Analysis</b>	6	<b>P</b> (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) <b>N</b> AGEC4037	Semester 1
<b>RSEC4132 Environmental Economics</b>	6	<b>A</b> (ECON2001 or ECOS2001), (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 <b>P</b> ECON2001 or ECOS2001 or AGEC2103 or AGEC2003 <b>N</b> ECON3013, AGEC4035	Semester 1
<b>RSEC4141 Resource Economics Project A</b>	9	<b>P</b> AGEC3104 or AGEC3004 or AGEC4041 <b>C</b> RSEC4142 <b>N</b> AGEC4012, AGEC4112	Semester 1
<b>RSEC4142 Resource Economics Project B</b>	9	<b>P</b> AGEC3104 or AGEC4112 or AGEC4041 <b>C</b> RSEC4141 <b>N</b> AGEC4013, AGEC4113	Semester 2
<b>AFNR4001 Professional Experience</b>	6	<i>Note: Department permission required for enrolment</i>	Semester 2
Plus an aggregate of 18 credit points of the following elective units, of which at least 6 credit points must be elective RSEC units:			
<b>AGEC4102 Agricultural Development Economics</b>	6	<b>P</b> (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103)	Semester 2
<b>AGEC4107 Special Topics</b>	6	<b>N</b> AGEC4007 <i>Note: Department permission required for enrolment</i>	Semester 1 Semester 2
<b>AGEC4108 Quantitative Planning Methods</b>	6	<b>P</b> AGEC3101 or AGEC3103 or AGEC3031 or AGEC3001 <b>N</b> AGEC4008	Semester 2
<b>RSEC4133 Economics of Mineral &amp; Energy Industries</b>	6	<b>A</b> (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 <b>P</b> (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) <b>N</b> ECON3013	Semester 2
When needed to complete a major, 6 credit points from the above elective units can be substituted with level 3 units from other disciplines, with approval of the degree coordinator.			

**Table RE1: Elective units of study available for inclusion in years 1 or 2 of the BResEc degree**

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>ACCT1001 Accounting IA</b>	6	<b>A</b> HSC Mathematics <b>N</b> ACCT1003, ACCT1004	Semester 1 Semester 2
<b>ACCT1003 Financial Accounting Concepts</b>	6	<b>N</b> ACCT1001, ACCT1002 <i>Terminating unit.</i>	Semester 1
<b>AFNR1001 The Rural Environment</b>	6		Semester 1
<b>AFNR1002 Climate and the Environment</b>	6		Semester 2
<b>BIOL1001 Concepts in Biology</b>	6	<b>A</b> None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL 1911 <i>It is recommended that BIOL (1001 or 1911) be taken concurrently with either BIOL1003 or BIOL1903. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.</i>	Semester 1 Summer Main
<b>BIOL1002 Living Systems</b>	6	<b>A</b> HSC 2-unit Biology. Students who have not completed HSC biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL1902 <i>It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.</i>	Semester 2
<b>BIOL1902 Living Systems (Advanced)</b>	6	<b>P</b> UAI (or ATAR equivalent) of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL1002 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>CHEM1001 Fundamentals of Chemistry 1A</b>	6	<b>A</b> There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. <b>N</b> CHEM1101, CHEM1901, CHEM1109, CHEM1903	Semester 1
<b>CHEM1101 Chemistry 1A</b>	6	<b>A</b> HSC Chemistry and Mathematics <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1109, CHEM1901, CHEM1903	Semester 1 Semester 2 Summer Main



<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>CHEM1901 Chemistry 1A (Advanced)</b>	6	<b>P</b> UAI (or ATAR equivalent) of at least 95 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1101, CHEM1109, CHEM1903 <i>Note: Department permission required for enrolment</i>	Semester 1
<b>CHEM1002 Fundamentals of Chemistry 1B</b>	6	<b>P</b> CHEM (1001 or 1101) or equivalent <b>N</b> CHEM1102, CHEM1108, CHEM1902, CHEM1904	Semester 2
<b>CHEM1102 Chemistry 1B</b>	6	<b>P</b> CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1108, CHEM1902, CHEM1904	Semester 1 Semester 2 Summer Main
<b>CHEM1902 Chemistry 1B (Advanced)</b>	6	<b>P</b> CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1102, CHEM1108, CHEM1904 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>CLAW1001 Foundations of Business Law</b>	6		Semester 1 Semester 2 Summer Early
<b>ECMT1010 Business and Economic Statistics A</b>	6	<b>N</b> ECMT1011, ECMT1012, ECMT1013, MATH1015, MATH1005, MATH1905, STAT1021, ECOF1010	Semester 1 Semester 2
<b>GEOS1001 Earth, Environment and Society</b>	6	<b>N</b> GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902	Semester 1 Summer Late
<b>GEOS1002 Introductory Geography</b>	6	<b>N</b> GEOS1902, GEOG1001, GEOG1002	Semester 2
<b>GEOS1003 Introduction to Geology</b>	6	<b>N</b> GEOS1903, GEOL1002, GEOL1902, GEOL1501	Semester 2
<b>GOVT1101 Australian Politics</b>	6		Semester 1
<b>GOVT1202 World Politics</b>	6		Semester 1 Semester 2
<b>PSYC1001 Psychology 1001</b>	6		Semester 1 Summer Main
<b>PSYC1002 Psychology 1002</b>	6		Semester 2 Summer Main
Modern Language (Level 1 or higher) units, with the approval of the Dean FAFNR			

**Notes:**

- Students may count no more than 12 credit points of the units specified in this table as elective units towards meeting the requirements of their degree (equivalently, 24 credit points in total when the units of compulsory Year 1 science are counted).
- ACCT1001 and ACCT1003 are mutually exclusive.
- Entry to ACCT1001 is restricted: the student's academic record must be as good as that needed for admission to the University's BCom program.
- Prerequisites apply for many second semester units.

**Table RE2: Elective units of study available for inclusion in years 2 or 3 of the BResEc degree**

Units of study in the following discipline areas (level 2000 or level 3000 unless otherwise specified):

Agricultural Economics (level 3000), Agricultural Chemistry, Animal Science, Biology (including plant science units), Chemistry, Commercial Law, Crop Science, Econometrics, Economics, Environmental Science, Finance, Geography, Geology, Government, Land and Water Science, Mathematics (including Statistics), Marine Science, Psychology, Soil Science

**Notes:**

- AGEC2102 is permitted for Year 2 only.
- Prerequisites and/or corequisites apply for most units.

**Majors in the BResEc degree**

The definitions of majors in the following tables apply for students commencing in 2005 or later. These students are required to complete 48 credit points in their chosen majors. Their majors must comply with the requirements for the BResEc degree as set out below, and also with the minimum requirements of the discipline teaching that major.

Students who have commenced in 2004 or earlier will be required to complete 44 credit points to obtain a major. The major will be defined according to the criteria as currently determined by the discipline teaching that major. The current requirements for majors in the Faculty of Economics and Business and the Faculty of Science can be found in the respective 2006 faculty handbooks.

All students must complete a Resource Economics major. In addition, students may also complete major(s) in other disciplines.

#### 4. Undergraduate course requirements

### Resource Economics major

#### Resource Economics

**Junior (Level 1) units**  
RSEC1031  
Two of (MATH1001, 1002, 1003 and 1005) or ECMT1010  
**Level 2 and 3 units**  
AGEC2101 and 2103  
Three of AGEC3103 and Level 4 RSEC units

### Non-Resource Economics majors available in the BResEc Degree

#### Agricultural Science

**Junior (Level 1) units**  
AFNR1001 AFNR1002  
**Level 2 and 3 units**  
PLNT2003 SOIL2003  
Four other level 2/3/4 Agricultural Science units of study

#### Biology

**Junior (Level 1) units**  
Two BIOL1000 units  
**Level 2 and 3 units**  
Two BIOL2000 units  
Four BIOL3000 units  
See FSc Handbook

#### Chemistry

**Junior (Level 1) units**  
One or two CHEM1000 units  
Two of MATH1001, 1002, 1003 and 1005  
**Level 2 and 3 units**  
Two specified CHEM2000 units  
Four CHEM2000 units  
See FSc Handbook

#### Commercial Law

**Junior (Level 1) units**  
CLAW1001 And either any CLAW2000 or CLAW3000 level units of study  
**Level 2 and 3 units**  
CLAW2201  
Any five further CLAW2000 or 3000 units  
See FEB Handbook

#### Econometrics

**Junior (Level 1) units**  
ECMT1010 and ECMT1020  
**Level 2 and 3 units**  
ECMT2110 and ECMT3110  
Four further ECMT2000 and ECMT3000 units  
See FEB Handbook

#### Economics

**Junior (Level 1) units**  
ECON1001 and ECON1002  
**Level 2 and 3 units**  
ECOS2001 and ECOS2002  
Any four further ECOS2000 or ECOS3000 units, of which at least two must be at the 3000 level.  
See FEB Handbook

#### Finance

**Junior (Level 1) units**  
ACCT1001\* or ACCT1003 and either ECMT1010 or ECON1001  
**Level 2 and 3 units**  
FINC2011 and FINC2012  
Any four further FINC3000 units, or three further FINC3000 units and one of either ACCT3013 or CLAW3201  
See FEB Handbook  
\*Restricted entry

#### Geography

**Junior (Level 1) units**  
GEOS1001 GEOS1003 GEOS1002 or other level 1 science unit  
**Level 2 and 3 units**  
Two GEOG or GEOS2000 units  
Four GEOG or GEOS3000 units  
See FSc Handbook

#### Geology

**Junior (Level 1) units**  
GEOS1003 and CHEM1001  
**Level 2 and 3 units**  
Two GEOL2000, GEOS2000 or MARS2000 units  
Four GEOS3000 or MARS3000 units  
See FSc Handbook

#### Government and International Relations

**Junior (Level 1) units**  
Two Level 1000 Government (GOVT) units  
**Level 2 and 3 units**  
Six GOVT2000 units  
See FEB Handbook

#### Marine Science

**Junior (Level 1) units**  
Two units (12 credit points) of Level 1 units in AFNR, BIOL or CHEM  
See FSc Handbook

#### Mathematics

**Junior (Level 1) units**  
MATH1001, 1002, 1003 and 1005 (or parallel advanced units)  
**Level 2 and 3 units**  
Two of MATH2061, MATH2065, MATH2070  
Six 4 credit point MATH3000 units  
See FSc Handbook

#### Soil Science

**Junior (Level 1) units**  
Two CHEM1000 units  
**Level 2 and 3 units**  
AGCH2003 SOIL2003  
24 credit points of SOIL3000 units

#### Statistics

**Junior (Level 1) units**  
MATH1001, 1002, 1003 and 1005 (or parallel advanced units)  
**Level 2 and 3 units**  
STAT2011 and STAT2012 and 24 credit points of STAT3000 units  
See FSc handbook

#### Notes:

- For disciplines based in other faculties (e.g. Geography is based in the Faculty of Science), the specification of a major here may differ from that in its 'home' faculty. The requirement for a major

within the BResEc degree is no less, nor more liberal, than in the discipline's 'home' faculty.

- A student can count a particular unit of study towards only one major.
- Where a student could count a unit of study towards more than one major, the student must nominate by the end of their final year the particular major to which the unit is to be allocated.

## Bachelor of Science in Agriculture (BScAgr)

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>Year 1</b>			
Year 1 will have the following 48 credit point structure:			
<b>AFNR1001 The Rural Environment</b>	6		Semester 1
<b>BIOM1003 Biometry 1</b>	6	<b>A</b> 70 or more in HSC Mathematics	Semester 1
<b>BIOL1001 Concepts in Biology</b>	6	<b>A</b> None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL 1911 <i>It is recommended that BIOL (1001 or 1911) be taken concurrently with either BIOL1003 or BIOL1903. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.</i>	Semester 1 Summer Main
or			
<b>BIOL1911 Concepts in Biology (Advanced)</b>	6	<b>P</b> 80+ in HSC 2-unit Biology (or equivalent) or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL 1001 <i>Note: Department permission required for enrolment It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. The completion of MBLG1001 is highly recommended.</i>	Semester 1
<b>CHEM1001 Fundamentals of Chemistry 1A</b>	6	<b>A</b> There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. <b>N</b> CHEM1101, CHEM1901, CHEM1109, CHEM1903	Semester 1
or			
<b>CHEM1101 Chemistry 1A</b>	6	<b>A</b> HSC Chemistry and Mathematics <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1109, CHEM1901, CHEM1903	Semester 1 Semester 2 Summer Main
or			
<b>CHEM1901 Chemistry 1A (Advanced)</b>	6	<b>P</b> UAI (or ATAR equivalent) of at least 95 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1001, CHEM1101, CHEM1109, CHEM1903 <i>Note: Department permission required for enrolment</i>	Semester 1
<b>AFNR1002 Climate and the Environment</b>	6		Semester 2
<b>AGEC1006 Economic Environment of Agriculture</b>	6	<b>A</b> HSC Mathematics <b>N</b> AGE1003, AGE1004	Semester 2
<b>BIOL1002 Living Systems</b>	6	<b>A</b> HSC 2-unit Biology. Students who have not completed HSC biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). <b>N</b> BIOL1902 <i>It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.</i>	Semester 2
or			
<b>BIOL1902 Living Systems (Advanced)</b>	6	<b>P</b> UAI (or ATAR equivalent) of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. <b>N</b> BIOL1002 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>CHEM1002 Fundamentals of Chemistry 1B</b>	6	<b>P</b> CHEM (1001 or 1101) or equivalent <b>N</b> CHEM1102, CHEM1108, CHEM1902, CHEM1904	Semester 2
or			
<b>CHEM1102 Chemistry 1B</b>	6	<b>P</b> CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent <b>C</b> Recommended concurrent units of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1108, CHEM1902, CHEM1904	Semester 1 Semester 2 Summer Main
or			
<b>CHEM1902 Chemistry 1B (Advanced)</b>	6	<b>P</b> CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent <b>C</b> Recommended concurrent unit of study: 6 credit points of Junior Mathematics <b>N</b> CHEM1002, CHEM1102, CHEM1108, CHEM1904 <i>Note: Department permission required for enrolment</i>	Semester 2
<b>Year 2</b>			
Year 2 will have the following 48 credit point structure:			
<b>ENVX2001 Applied Statistical Methods</b>	6	<b>P</b> BIOM1003 or MATH1011 and MATH1015	Semester 1
<b>GENE2001 Agricultural Genetics 2</b>	6	<b>P</b> At least one of (BIOL1001, BIOL1002, BIOL1101, BIOL1901, BIOL1911)	Semester 1
<b>PLNT2001 Plant Biochemistry and Molecular Biology</b>	6	<b>P</b> 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) <b>N</b> PLNT2901, AGCH2001	Semester 1
or			
<b>PLNT2901 Plant Biochem &amp; Molecular Biology (Adv)</b>	6	<b>P</b> A Distinction average in 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) <b>N</b> PLNT2001, AGCH2001	Semester 1

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>SOIL2003</b> Soil Properties and Processes	6		Semester 1
<b>AVBS1002</b> Concepts of Animal Management	6	P 6 credit points of junior Biology	Semester 2
<b>ENTO2001</b> Agricultural Entomology	6		Semester 2
<b>MICR2024</b> Microbes in the Environment	6	P 12 credit points of first year Biology N MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2021, MICR2921, MICR2909	Semester 2
<b>PLNT2003</b> Plant Form and Function	6	A 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) N PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
or			
<b>PLNT2903</b> Plant Form and Function (Advanced)	6	A 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) N PLNT2003, BIOL2003, BIOL2903, CROP2001	Semester 2
<b>Year 3*</b>			
Year 3 will have the following structure: a core (24 credit points) of			
<b>AGCH3025</b> Chemistry and Biochemistry of Foods	6	P AGCH2003 or AGCH2004 or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 or 6 credit points of Intermediate units in Chemistry N AFNR5102	Semester 1
<b>PPAT3003</b> Plant Disease	6	P MICR2024	Semester 1
<b>AGRO3004</b> Managing Agro-Ecosystems	6	A AFNR1001, AFNR1002, SOIL2003, and BIOM1003 P PLNT2003 or PLNT2903	Semester 2
<b>SOIL2004</b> The Soil Resource	6		Semester 2
And 24 credit points from Table D.			
<b>Table D - Year 3 Electives</b>			
<b>AFNR3001</b> Agro-ecosystems in Developing Countries	6	<i>Note: Department permission required for enrolment</i>	S1 Intensive
Agricultural Chemistry			
<b>AGCH3032</b> Land and Water Ecochemistry	6	P AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 N AGCH3030, AGCH3031	Semester 2
<i>Note: Department permission will be required for enrolment in AGCH3032</i>			
Agricultural Economics			
<b>AGEC2102</b> Agribusiness Marketing	6	P AGECE1006 or (AGECE1003 and AGECE1004) or AGECE1002 or AGECE1102 or RSEC1031 or AGECE1031	Semester 1
<b>AGEC2103</b> Production Economics	6	P AGECE1102 or AGECE1006 or (AGECE1003 and AGECE1004) or RSEC1031 N AGECE2003	Semester 1
<b>AGEC2105</b> Applied Econometric Modelling	6	P (ECMT1010 and ECMT1020) or (MATH1001 and MATH1002 and MATH1003 and MATH1005) or BIOM1003 or RSEC1031 N AGECE2005	Semester 1
<b>AGEC3101</b> Agribusiness Management	6	P AGECE2103 or AGECE2003 or AGECE1006 or (AGECE1003 and AGECE1004) N AGECE1102; AGECE3103; AGECE3001	Semester 2
<b>AGEC3103</b> Applied Optimisation	6	P (AGECE2001 or AGECE2101) and (AGECE2003 or AGECE2103) N AGECE3101	Semester 1
<b>AGECE2101</b> Market and Price Analysis	6	P AGECE1102 or AGECE1006 or (AGECE1003 and AGECE1004) or RSEC1031 N AGECE2001	Semester 2
<b>AGECE3102</b> Agricultural and Resource Policy	6	P (AGECE2001 or AGECE2101) and (AGECE2003 or AGECE2103) N AGECE3002	Semester 1
Animal Science			
<b>ANSC3102</b> Animal Reproduction	6	A ANSC3104	Semester 1
<b>ANSC3103</b> Animal Structure and Function A	6	A AVBS1002 P 12 credit points of junior biology	Semester 1
<b>ANSC3101</b> Animal Nutrition 3	6	P ANSC2002 or AVBS1002	Semester 2
<b>ANSC3104</b> Animal Structure and Function B	6	A AVBS1002 P ANSC3103	Semester 2
Biotechnology			
<b>BIOL3018</b> Applications of Recombinant DNA Tech	6	P 12 credit points from MBLG (2071/297), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. N BIOL3918	Semester 1
or			
<b>BIOL3918</b> Applications of Recombinant DNA Tech Adv	6	P Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. N BIOL3018	Semester 1
Environmetrics			

4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>ENVX3001</b> Environmental GIS	6	A least 48 credit points in second year agriculture/science units.	Semester 1
<b>ENVX3002</b> Statistics in the Natural Sciences	6	P ENVX2001 or BIOM2001 or STAT2012 or STAT2912	Semester 1
Horticulture			
<b>HORT3005</b> Production Horticulture	6	A AFNR1001, AFNR1002 and HORT2002 P Two of PLNT2001, PLNT2901, PLNT2002, PLNT2902, PLNT2003, PLNT2903	Semester 1
Plant Pathology			
<b>BIOL3017</b> Fungi in the Environment	6	P 12 credit points of Intermediate Biology or Plant Science, or 6 credit points of Intermediate Biology, or Plant Science, and 6 Intermediate credit points of either Microbiology or Geography. N BIOL3917 Dates: 15-26 February 2010. The completion of 6 credit points of MBLG units is highly recommended.	S1 Intensive
or			
<b>BIOL3917</b> Fungi in the Environment (Advanced)	6	P Distinction average in 12 credit points of Intermediate Biology and Plant Science, or 6 credit points of Intermediate Biology, or Plant Science, and 6 Intermediate credit points of either Microbiology or Geography. N BIOL3017 The completion of 6 credit points of MBLG units is highly recommended.	S1 Intensive
Plant Science			
<b>PLNT2002</b> Aust Flora: Ecology and Conservation	6	P 6 credit points of a Junior unit of study N PLNT2902	Semester 1
or			
<b>PLNT2902</b> Aust Flora: Ecology & Conservation (Adv)	6	A The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading P Distinction average in 6 credit points of Junior units of study N PLNT2002	Semester 1
or			
<b>PLNT3003</b> Systematics and Evolution of Plants	6	P 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. N PLNT3903, BIOL3015/3915.	Semester 1
or			
<b>PLNT3903</b> Systematics and Evolution of Plants Adv	6	P Distinction average in 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. N PLNT3003, BIOL3015/3915.	Semester 1
<b>PLNT3001</b> Plant, Cell and Environment	6	P 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent N PLNT3901	Semester 2
or			
<b>PLNT3901</b> Plant, Cell and Environment (Advanced)	6	P 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent with average grade of distinction N PLNT3001 Note: Department permission required for enrolment	Semester 2
or			
<b>PLNT3002</b> Plant Growth and Development	6	P 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent N PLNT3902, BIOL3021, BIOL3931	Semester 2
or			
<b>PLNT3902</b> Plant Growth and Development (Advanced)	6	P 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent. These requirements may be varied and students with lower averages should consult the unit Executive Officer. N PLNT3002, BIOL3021, BIOL3931	Semester 2
<b>Year 4*^</b>			
In semester one Year 4 students will complete:			
<b>AFNR4101</b> Research Project A	12	P 144 credit points of level 1000-3000 units of study	Semester 1
One core unit from Table E			
And one core or elective unit from Table D, E or F.			
In semester two Year 4 students will complete:			
<b>AFNR4001</b> Professional Experience	6	Note: Department permission required for enrolment	Semester 2
<b>AFNR4102</b> Research Project B	12	P AFNR4101	Semester 2
And one core or elective unit from Table D, E or F			
* Maximum of 2 core units in Year 4 depending on discipline (see Table E)			
^ A student may apply to the degree coordinator for permission to enrol in up to one (6 cp) elective University of Sydney unit of study in year 3 and up to one (6 cp) University of Sydney unit of study in year 4 which is not listed in Tables D or E. The application must (1) be made prior to enrolment in the unit (2) be submitted with a written academic justification for enrolment by the student and (3) be submitted with written approval of the relevant unit of study coordinator.			

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>Table E - Year 4 Core</b>			
Agricultural Chemistry			
<b>AGCH4007 Instrumentation in Analytical Chemistry</b>	6	<b>P</b> PLNT2001 or PLNT2901 or AGCH2003 or AGCH2004	Semester 1
<b>SOIL3009 Contemporary Field and Lab Soil Science</b>	6	<b>P</b> SOIL2003	Semester 1
Agricultural Economics			
<b>AGEC4103 International Agricultural Trade</b> <i>This unit of study is not available in 2010</i>	6	<b>P</b> (AGEC2001 or AGECE2101) and (AGEC2003 or AGECE2103) <b>N</b> AGECE4003	Semester 1
<b>AGEC4104 Agribusiness Analysis</b>	6	<b>P</b> (AGEC2001 or AGECE2101) and (AGEC2003 or AGECE2103)	Semester 1
<b>AGEC3102 Agricultural and Resource Policy</b>	6	<b>P</b> (AGEC2001 or AGECE2101) and (AGEC2003 or AGECE2103) <b>N</b> AGECE3002	Semester 1
Agricultural Genetics			
<b>GENE4015 Cytogenetics</b>	6	<b>P</b> BIOM2001, GENE2001	Semester 2
<b>GENE4012 Plant Breeding</b>	6	<b>P</b> BIOM2001, GENE2001	Semester 2
Agronomy			
<b>AGRO4003 Crop and Pasture Agronomy</b>	6	<b>P</b> AGRO3004 or PLNT2003 or PLNT2903	Semester 1
<b>AGRO4004 Sustainable Farming Systems</b>	6	<b>P</b> AGRO3004	Semester 1
Entomology			
<b>ENTO4004 Insect Taxonomy and Systematics</b>	6	<b>P</b> ENTO2001 or ENTO2002 or BIOL2017 or BIOL2917 (Note: BIOL2017/BIOL2917 are only for the BSc students who elect to take this unit of study)	Semester 1
<b>ENTO4003 Integrated Pest Management</b>	6	<b>P</b> ENTO2001 or ENTO2002 or BIOL2017 or BIOL2917 (Note: BIOL2017/BIOL2917 are only for BSc students who elect to take this UoS)	Semester 2
Environmetrics			
<b>ENVX4002 Environmetrics 4</b>	6	<b>P</b> BIOM3004 or BIOM3005 or BIOM3006 or ENVX3002	Semester 1
<b>ENVX4001 GIS, Remote Sensing and Land Management</b>	6	<b>A</b> Some knowledge of GIS and spatial information systems and/or some knowledge of soil science, geomorphology or environmental science. <i>Note: Department permission required for enrolment Consent of the unit coordinator required.</i>	Semester 2
Farming Systems			
<b>AGEC4104 Agribusiness Analysis</b>	6	<b>P</b> (AGEC2001 or AGECE2101) and (AGEC2003 or AGECE2103)	Semester 1
<b>AGRO4004 Sustainable Farming Systems</b>	6	<b>P</b> AGRO3004	Semester 1
Food Science			
<b>AGCH3026 Food Biotechnology</b>	6	<b>P</b> AGCH2003 or AGCH2004 or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 or 6 credit points of Intermediate units in Chemistry <b>C</b> AGCH3025 <b>N</b> AFNR5103	Semester 1
<b>AGCH4007 Instrumentation in Analytical Chemistry</b>	6	<b>P</b> PLNT2001 or PLNT2901 or AGCH2003 or AGCH2004	Semester 1
Horticulture			
<b>HORT4004 Issues in Horticultural Science 4A</b>	6	<b>P</b> HORT3001 or HORT3004	Semester 1
<b>HORT4005 Research and Practice in Hort Science</b>	6	<b>P</b> HORT3005	Semester 2
Livestock Production			
<b>AGRO4003 Crop and Pasture Agronomy</b>	6	<b>P</b> AGRO3004 or PLNT2003 or PLNT2903	Semester 1
<b>AGRO4005 Livestock Production Systems</b>	6	<b>A</b> ANSC3101 <b>P</b> AGRO3004	Semester 2
Note: Permission is required for enrolment in AGRO4005 Livestock Production Systems			
Plant Pathology			
<b>PPAT4004 Advanced Mycology and Plant Pathology</b>	6	<b>P</b> PPAT3003 or BIOL3017	Semester 1
<b>PPAT4005 Soil Biology</b>	6	<b>P</b> MICR2024 or 6cp intermediate microbiology	Semester 1
Soil Science			
<b>SOIL3009 Contemporary Field and Lab Soil Science</b>	6	<b>P</b> SOIL2003	Semester 1

## 4. Undergraduate course requirements

<b>Unit of study</b>	<b>Credit points</b>	<b>A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition</b>	<b>Session</b>
<b>SOIL3010</b> The Soil at Work	6	P SOIL2003 or SOIL2004	Semester 2
<b>Table F - Year 4 electives (not including year 3 electives and year 4 core)</b>			
Agricultural Genetics			
<b>GENE4013</b> Molecular Genetics and Breeding	6	P BIOM2001, GENE2001	Semester 1
<b>GENE4014</b> Population and Quantative Genetics	6	P BIOM2001, GENE2001 C GENE4012	Semester 1
Animal Science			
<b>AVBS4009</b> Aquaculture	6	P Animal and Veterinary Bioscience years 1-3 OR Bachelor of Science in Agriculture years 1-3	Semester 1
<b>ANSC3107</b> Animal Genetics 3	6	P GENE2001 or MBLG2072 or MBLG2972	Semester 2
<b>AVBS4002</b> Dairy Production and Technology	6	A Enrolled students are expected to have some understanding of key components of the dairy production system, including basic knowledge of animal physiology and nutrition. P ANSC3101, (Animal and Veterinary Bioscience years 1-3 OR Bachelor of Science in Agriculture years 1-3)	Semester 2
<b>AVBS4008</b> Intensive Animal Industries	6	P (Animal and Veterinary Bioscience years 1-3) OR (Bachelor of Science in Agriculture years 1-3) N AVBS4006, AVBS4007	Semester 2
<b>AVBS4012</b> Extensive Animal Industries	6	P Animal and Veterinary Bioscience years 1-3 OR Bachelor of Science in Agriculture years 1-3 N AVBS4010, AVBS4011	Semester 1
Land and Water Science			
<b>LWSC3005</b> Environmental Water Quality	6	P LWSC2002 or GEOG2321 or AGCH2003 or 6 credit points of intermediate Chemistry	Semester 1
Plant Pathology/Microbiology			
<b>VIRO3001</b> Virology	6	A MICR (2021 or 2921 or 2022 or 2922) P At least 6 credit points of MBLG units and at least 6 credit points in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024. N VIRO3901 <i>Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.</i>	Semester 1
<b>MICR3022</b> Microbial Biotechnology	6	P At least 6 credit points of MBLG units and 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807). For BScAgr students: PLNT (2001 or 2901) and MICR2024. N MICR3922, MICR3002, MICR3902	Semester 2



## 5. Undergraduate units of study

### Accounting units of study

For ACCT units of study not listed below, please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

#### ACCT1001

##### Accounting IA

**Credit points:** 6 **Session:** Semester 1, Semester 2 **Classes:** 3 hrs of lectures/tutorials per week **Prohibitions:** ACCT1003, ACCT1004 **Assumed knowledge:** HSC Mathematics **Assessment:** Mid-semester examination; Tutorial quizzes and assignments; Practice Set; Final examination

Accounting 1A introduces students to the fundamentals of accounting and the double entry system of financial recording. Students examine the assumptions underlying the preparation of financial statements for external users and gain the skills necessary to prepare, interpret and analyse financial statements. In doing so students develop their ability to understand, discuss, analyse and write about accounting-related topics. This unit is designed as an introduction to accounting. As such, no prior knowledge of accounting is assumed.

#### ACCT1002

##### Accounting IB

**Credit points:** 6 **Session:** Semester 1, Semester 2 **Classes:** 3 hrs of lectures/tutorials per week **Prerequisites:** ACCT1001 **Prohibitions:** ACCT1003, ACCT1004 **Assessment:** Homework tasks; Group project; Interactive On-line Assessment; Final examination

Accounting is about the recording, classification, reporting and interpretation of information to help make economic decisions. Accounting 1A introduces accounting and the double entry system for financial recording. Accounting 1B develops themes and competencies learnt in Accounting 1A. The primary focus of this unit of study is on conceptual and technical issues relating to management accounting and the information required by internal users to make strategic and operational decisions relating to managing a business. A second theme is the financial accounting information businesses are required to produce to assess a firm's financial state and performance. Students examine how commercial and ethical issues affect business decisions and how there are present and future consequences that will affect different groups of interest.

#### ACCT1003

##### Financial Accounting Concepts

**Credit points:** 6 **Session:** Semester 1 **Classes:** 3 hrs of lectures/tutorials per week **Prohibitions:** ACCT1001, ACCT1002 **Assessment:** Group assignments; Mid-semester examination; Final examination.

*Note: Terminating unit.*

Provides an introduction to the concepts underlying "external" accounting and is designed for students who are not majoring in accounting. The unit utilises a transaction-effect approach to the preparation of financial statements with basic bookkeeping minimalised. Accounting-method choices are analysed for their effect on the financial statements, and, thus, on decision-making.

#### ACCT1004

##### Management Accounting Concepts

**Credit points:** 6 **Session:** Semester 2 **Classes:** 3 hrs of lectures/tutorials per week **Prohibitions:** ACCT1001, ACCT1002 **Assessment:** Quizzes; Assignment; Presentation; Final examination.

*Note: Terminating unit.*

This unit is designed to explain how managers use accounting information, with an emphasis on identifying relevant accounting

information for decision-making. Topics include: estimating cost functions, relevant costing, cost allocation, budgeting, short and long term decision making and managing within a changing environment.

#### AFNR1001

##### The Rural Environment

**Credit points:** 6 **Teacher/Coordinator:** Dr Daniel Tan **Session:** Semester 1 **Classes:** (2 lec, 1 tut, 2 prac)/wk **Assessment:** On-line assessment (problem based learning), practical reports and plant collection, practical tests, two hr final exam. **Practical field work:** Field practical sessions allow 'hands-on' experience with agronomy and animal husbandry

This unit allows students to discuss Australian rural production and the Australian environment, their interrelation, the issues agriculture and the environment face for the future and the context in which this takes place. It is a core unit for students in BScAgr and BAnVetBioSc and is the main introductory unit for further studies in the Faculty. For studies in the area of Agriculture and Natural Resources, it is important to be able to identify and describe common domestic animals, crops and weeds, broad acre production systems, key environmental issues and to be able to discuss their significance. Students completing this unit of study will be able to relate the Australian environment to opportunities and limitations for agronomy, animal husbandry and native animal and plant species, partly through problem based learning (PBL) in relation to a topical rural issue. In addition students will practice the identification of economic plant species and explore the ecology of pests and weeds and related integrated management practices. Through the problem based activities, students will learn valuable research skills and how to critically assess sources of information through library and database research. Through the production of reports and essays, students can demonstrate academic writing and recognise the importance of academic honesty.

##### Textbooks

Malcolm B, Sale P, Leury B, Barlow S (2009). 'Agriculture in Australia An Introduction (2 edn).' (Oxford University Press: South Melbourne)  
Pearson CJ, Cunningham GM and King DH (1993). 'A Plain English Guide to Agricultural Plants.' (Longman Cheshire: Melbourne)  
Pratley JE (Ed) (2003). 'Principles of Field Crop Production. (4 edn)' (Oxford University Press: South Melbourne)

#### AFNR1002

##### Climate and the Environment

**Credit points:** 6 **Teacher/Coordinator:** Dr Daniel Tan **Session:** Semester 2 **Classes:** (2 lec, 1 tut & 2 prac)/wk **Assessment:** On-line assessments (problem based learning), laboratory reports and web activities, 2 hr final exam.

This unit allows the students to discover how climate influences the biophysical and biotic environment and how this affects rural production, native and domestic animals, crops and pastures, native vegetation and pest populations; it also highlights the importance of physics in solving problems in relation to climate and rural production. It is a core unit for students in BScAgr and BAnVetBioSc, builds on knowledge gained in AFNR1001 and lays the basis for studies in the biophysical area of the Faculty. For studies in the area of Agriculture and Natural Resources, it is important to develop knowledge and quantitative skills in the basic physical principles and the main drivers for climate and climate change in an agricultural context. Students completing this unit of study will be able to reflect on the ecosystem interactions between animals, plants and the biophysical environment. In addition, students will experiment with how changes in climate and spatial climate variability can affect animal and pest populations, vegetation densities and cropping patterns and its relation to management decisions. Using problem based activities, students will learn valuable research skills and to critically assess sources of information through library and database research. Students will



demonstrate academic writing by producing reports and essays and recognise the importance of academic honesty.

*Textbooks*

Malcolm B, Sale P, Leury B, Barlow S (2009). 'Agriculture in Australia An Introduction (2 Edn).' (Oxford University Press: South Melbourne)  
Denny MW (1993) 'Air and Water: the Biology and Physics of Life's Media (Princeton University Press).

### AFNR4001

#### Professional Experience

**Credit points:** 6 **Teacher/Coordinator:** Ms Lynn Henry, Dr Damien Field  
**Session:** Semester 2 **Classes:** Workshops over 4 years **Assessment:** Portfolio in the 4th year, On-line (multi media) case studies, blog postings (1000 words total). **Practical field work:** 60 days of professional experience, 1 week long excursion

*Note: Department permission required for enrolment.*

This unit of study is designed to allow students to critically reflect on the relationship between the rural enterprise and environment and how they can contribute to the future decisions and management affecting the rural community. It is a core unit of study in 4th year for the BAgEc, BScAgr, BLWSc, BResEc, BHortSc which requires students to complete 60 days of professional experience with the expectation that students will examine the nature of facts from their degree in this environment. The unit will be counted towards 4th year, but professional experience placements will normally be undertaken throughout the degree. In the early stages of the Professional Experience program students participate in Faculty excursions that have been developed so they can experience a range of activities, such as research, extension, on-farm and industry both in the rural and urban environment to complement their learning within their individual degree programs. Building on this various workshops have been developed to assist students to identify a rural environment theme or issue of their interest with the specific emphasis being placed on them reflecting on how their new understandings of their theme of interest affects their personal and professional development. . To complete this unit students will present a portfolio of their theme including critical reflection on the pivotal relationships between the academic degree, rural environment, professional experience, and beliefs and values if the rural community. Through developing these pivotal relationships, students will be able to use their new understandings to support and guide the future developments in the rural enterprise and environment. By developing and presenting the portfolio and engaging in other online activities the students will enhance their skills in inquiry, information literacy and communication. In particular the autonomous development of case studies reflecting the contemporary issues in agriculture and their professional placements the students will have to consider their understandings of ethical, social and professional issues and further develop the personal and intellectual autonomy.

### AFNR4101

#### Research Project A

**Credit points:** 12 **Teacher/Coordinator:** Dr Stephen Cattle **Session:** Semester 1 **Classes:** No formal classes, approx 18h per week **Prerequisites:** 144 credit points of level 1000-3000 units of study **Assessment:** Research proposal, literature review.

This unit aims to develop a student's ability to undertake a major research project in an area of specialization. The unit builds on theoretical and applied knowledge gained across most of the units of study undertaken throughout their degree program. This unit is a corequisite with AFNR4102 and each student will work with an academic supervisor in an area of specialization and develop a well defined research project to be executed. The research project is undertaken to advance the students ability to build well-developed research skills, a strong analytical capacity, and the ability to provide high quality research results demonstrating a sound grasp of the research question. Working with an academic supervisor students will develop their ability to define a research project including the producing of testable hypotheses, identifying existing knowledge from reviewing the literature and the design and execution of a research strategy towards solving the research question. Students will build on their

previous research and inquiry skills through sourcing a wide range of knowledge to solve the research problem and enhance their intellectual and personal autonomy by means of the development of experimental programs. Students will improve their written and planning skills by composing a research project proposal and the writing of a comprehensive literature review.

### AFNR4102

#### Research Project B

**Credit points:** 12 **Teacher/Coordinator:** Dr Stephen Cattle **Session:** Semester 2 **Classes:** No formal classes, approx 18h per week **Prerequisites:** AFNR4101 **Assessment:** Oral presentation, research paper, poster.

This unit is a continuation of the major research project initiated in AFNR4101 and continues to build on theoretical and applied knowledge gained across most of the units of study undertaken throughout their degree program. Working with their academic supervisor in the area of specialization the student will continue to pursue the defined research project towards presenting final results and conclusions. The research results are presented in a format of a research paper as submitted to a research journal. The research paper and corrected literature review is combined and presented together as a thesis. Students will continue to build their research skills, develop strong analytical capacity, demonstrate a sound grasp of the topic, and an ability to interpret results in a broad framework. Working with an academic supervisor students will develop their ability to produce results of high quality, draw reliable conclusions and identify future areas avenues of research. Students will build on their previous research and inquiry skills through sourcing a wide range of knowledge to solve the research problem and enhance their intellectual and personal autonomy by means of the managing the research program. Students will improve their communication skills through oral presentation of their research findings, the production of a poster detailing their research findings and the writing of a research paper.

### AGCH2003

#### Rural Environmental Chemistry

**Credit points:** 6 **Teacher/Coordinator:** Dr Robert Caldwell, Prof Ivan Kennedy **Session:** Semester 1 **Classes:** 3 lec/week and 30 hours of lab/semester **Prerequisites:** 12 credit points of Junior Chemistry **Prohibitions:** AGCH2001, AGCH2002 and CHEM2404 **Assessment:** One 2 hr exam, laboratory reports, theory of laboratory test, lecture quiz.

This introductory unit of study consists of aspects of chemistry relevant in studies of basic and applied biological sciences including agriculture, food and the rural environment. Lecture topics include an introduction to quantitative aspects of biophysical, environmental and aquatic chemistry with particular reference to protocols for specimen sampling and maintenance of specimen quality; the principles of basic analytical methods such as spectroscopy, chromatography and electrochemistry; environmental aspects of water such as thermal properties and its behaviour as a solvent of hydrophobic solutes, surfactants, neutral hydrophilic solutes, salts and other electrolytes, and gases. The lectures will also include environmental nutrient cycling (C, N, S, O, P, micronutrients) with reference to pesticides, herbicides, organic and inorganic pollutants affecting agricultural produce and the environment, and gases of environmental concern. Ten laboratory sessions will demonstrate aspects of analytical chemistry including: elemental analysis of foods and natural waters, spectrophotometry, chromatographic techniques, preparation of buffers, fundamentals of pH and conductance measurement, water as a solvent including the effect of surfactants and electrolytes. Students will analyze natural water samples using the skills acquired in earlier laboratory sessions and write an environmental assessment from their findings. An on-line tutorial on safety procedures in a chemistry laboratory is a pre-requisite for commencement of laboratory experiments.

### AGCH3025

#### Chemistry and Biochemistry of Foods

**Credit points:** 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Dr Robert Caldwell, Prof Les Copeland **Session:** Semester 1 **Classes:** 3 lec/wk; 24 hrs lab **Prerequisites:** AGCH2003 or AGCH2004 or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 or 6 credit points of Intermediate units in Chemistry

**Prohibitions:** AFNR5102 **Assessment:** One 2-hr theory exam, practical reports, lecture quizzes.

This unit of study aims to give students an understanding of the properties of food constituents, and the interactions between these constituents during food processing, storage and digestion. The unit will develop an understanding of the relationship between form and functionality of constituents and the concept of fitness-for-purpose (ie, quality) in converting agricultural products into foods. Students will gain an appreciation of the relationship between chemical composition and properties of macroconstituents (carbohydrates, proteins, lipids) and microconstituents (vitamins, minerals, flavour and antinutritional chemicals) and their functions in plant and animal based foods. The material presented in lectures and practical classes will enable students to develop research and inquiry skills and an analytical approach in understanding the biochemistry of foods, food processing and storage. On completing this unit, students will be able to describe the chemical and biochemical properties of major food constituents, and demonstrate an understanding of the functionality of these constituents in food processing and nutrition. Students will have gained experience in laboratory techniques used in industry for the analysis of some food products, and information literacy and communication skills from the preparation of practical reports.

#### Textbooks

Laboratory notes will be available for purchase from the Copy Centre in the first week of semester and lecture notes and readings will be made available through WebCT. There is no recommended textbook.

### AGCH3026

#### Food Biotechnology

**Credit points:** 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Dr Robert Caldwell, Prof Les Copeland **Session:** Semester 1 **Classes:** 3 lec/wk; 24 hrs lab **Prerequisites:** AGCH2003 or AGCH2004 or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 or 6 credit points of Intermediate units in Chemistry **Corequisites:** AGCH3025 **Prohibitions:** AFNR5103 **Assessment:** One 2-hr exam, practical reports, oral and written presentation on a case study.

This unit aims to give students an understanding of the chemistry, biochemistry and biotechnology of analytical and diagnostic methods and manufacturing processes used in the conversion of raw products into foods. Knowledge of food constituents gained in AGCH3025 will be applied to develop an understanding of: the use of enzymes in food processing and diagnostic technologies; processing of cereal, legume and oilseed grains, and livestock products, into foods; doughs and baking technologies; the evaluation of foods and food quality. Emphasis is placed on current issues faced by the food industry (including GM technology, organic production, and food safety) through a series of special guest lectures from people connected with the food industry. On completing this unit, students will have gained an enhanced understanding of food production and manufacturing systems, the processing of raw ingredients into food products, and food analysis and evaluation. Students will have gained experience in laboratory techniques used in industry for the analysis of some food products, and information literacy and communication skills from the preparation of a case study and practical reports.

#### Textbooks

Laboratory notes will be available for purchase from the Copy Centre in the first week of semester and lecture notes and readings will be made available through WebCT. There is no recommended textbook.

### AGCH3032

#### Land and Water Ecochemistry

**Credit points:** 6 **Teacher/Coordinator:** Professor Ivan Kennedy, Dr Robert Caldwell **Session:** Semester 2 **Classes:** 5-day field trip in AVCC common break; 20 hr lectures/tutorials, 25 hr laboratory classes and project during semester **Prerequisites:** AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 **Prohibitions:** AGCH3030, AGCH3031 **Assessment:** One 2 hr exam, field trip report and presentation, prac and project reports.

This field-oriented unit will develop professional expertise in rural ecochemistry, measuring impacts on sustainability and seeking solutions to chemical problems at the catchment scale. AGCH3032 is an elective unit suitable for the BSc, BScAgr, BLWSc, BHortSc, BResEc and BAnVetBioSc degrees, building on intermediate units in

chemistry or biochemistry. It will promote knowledge and professional skills related to key chemical processes in ecosystems causing risks to soil and water resources, the quality of agricultural produce and to ecological biodiversity. These will be examined by quantitative risk analysis, targeted monitoring and remediation, seeking innovative solutions (e.g. IPM and genetic modification).

A field trip in the AVCC break and professional report on a chosen topic will investigate relevant case studies at selected centres in eastern Australian doing innovative research on global warming and climate change, soil and water quality and environmental protection. Lectures will provide knowledge in the environmental C, N and S cycles important for sustaining action in ecosystems, the nature of greenhouse gases and mitigation of their production including C sequestration, risks to biota (soil, water, plants, animals) from acidification and innovative means of remediation, environmental risk from pesticides and other pollutants, monitoring and their remediation. In laboratory exercises, students will gain skills in relevant analyses using GC, LC, mass spectrometry and ELISA. The assessment procedures are designed to provide students with skills in definition of research problems and risk assessment, quality in analyses, risk management and remediation, and effective communication of outputs.

### AGCH4007

#### Instrumentation in Analytical Chemistry

**Credit points:** 6 **Teacher/Coordinator:** Dr Robert Caldwell **Session:** Semester 1 **Classes:** Four student contact hours on average per week: Lectures: 13 hours (in weeks 1 to 13); Laboratories: 8 x 3 h **Prerequisites:** PLNT2001 or PLNT2901 or AGCH2003 or AGCH2004 **Assessment:** One 2hr exam, laboratory work reports, one major problem solving assignment.

This unit of study is designed to expose students to the principles and technology associated with modern analytical instrumentation. This unit plays an important role for students undertaking complementary studies in analytical food or environmental chemistry. Students are given the theoretical principles behind the instrumentation and wherever possible given hands-on training in the use of that instrumentation. At the conclusion of this unit, students should be able to develop software analysis protocols for several analytical instruments, carry out analytical procedures, and perform basic fault-finding diagnostics. Students will be able to confidently assert that they have had experience in certain types of analytical procedures and operations using a range of analytical instrumentation.

### AGEC1006

#### Economic Environment of Agriculture

**Credit points:** 6 **Teacher/Coordinator:** Ms Lynn Henry **Session:** Semester 2 **Classes:** (3 lec, 1 workshop)/wk **Prohibitions:** AGECE1003, AGECE1004 **Assumed knowledge:** HSC Mathematics **Assessment:** One two hour exam, workshop papers, mid semester exam.

To give students an overview of the structure, viability and importance of the agricultural sector in the Australian economy. It is a core unit of study in the BScAgr, BHortSc and BAnVetBioSc degrees. It is designed to give an understanding of the basic economic principles and how they relate to Australian agriculture. Students will look at basic economic theory and concepts and then apply these concepts to solve simplified versions of real problems faced by the agriculture and resource sectors. Students will look at the relationship between these concepts and the concepts learnt within their science related courses. Students will be able to analyse economic concepts and apply these concepts to real world scenarios. They will be able to synthesis and comprehend the relationship between the economic and science disciplines. The students will gain skills through workshop based tasks, information literacy and communication skills through the presentation of the workshop reports and discussion throughout the workshop.

#### Textbooks

HE Drummond and JW Goodwin, Agricultural Economics, 2nd edn (Prentice-Hall, 2004).

### AGEC1101

#### Agricultural and Resource Systems

**Credit points:** 6 **Teacher/Coordinator:** Dr Michael Harris **Session:** Semester 2 **Classes:** (3x1hour lectures, 1x1hour tutorial)/week **Prohibitions:** AGECE1001 **Assumed knowledge:** HSC Mathematics or HSC Mathematics Extension 1 **Assessment:** 1x1hour mid-semester exam, 1x2hour final exam, 1xassignment, tutorial papers.

An introductory unit of study which serves as a foundation for later units in agricultural economics, and introduces some of the basic economic principles required in the discipline of agricultural and resource economics. Topics covered include the agricultural and resource industries in the Australian and world economies; changing place of agriculture in world economies; place of agriculture in economic development; economic and physical factors determining the location of agricultural and resources industries; the changing structure of the Australian agricultural and resource sectors; the physical and biological environment in which farm firms operate; issues in natural resources.

### AGEC1102

#### Agricultural Economics 1

**Credit points:** 6 **Teacher/Coordinator:** Dr Paulo Santos **Session:** Semester 1 **Classes:** (2x1hour lectures, 1x2hour tutorial)/week **Prohibitions:** AGECE1002 **Assumed knowledge:** HSC Mathematics or HSC Mathematics Extension 1 **Assessment:** Assignments, one final exam, tutorial papers

The unit uses class experiments and discussion of academic papers to build intuition about the behavioral principles underlying the functioning of markets and their importance. Through the discussion of an online problem, these principles are applied to a policy question in the agricultural sector. Several exercises develop the necessary skills in the use of mathematics.

#### Textbooks

Partha Dasgupta, Economics. A very short introduction, Oxford University Press; Theodore C. Bergstrom and John H. Miller, Experiments with microeconomic principles: microeconomics (2nd edition), McGrawHill.

N.B. Students are advised not to buy the textbooks before lectures commence in case there are any changes.

### AGEC2101

#### Market and Price Analysis

**Credit points:** 6 **Teacher/Coordinator:** Dr Shyamal Chowdhury **Session:** Semester 2 **Classes:** (2-3 lec & 1x1hour tut)/wk **Prerequisites:** AGECE1102 or AGECE1006 or (AGECE1003 and AGECE1004) or RSEC1031 **Prohibitions:** AGECE2001 **Assessment:** Mid semester exam (1 hour), final exam (2 hours), tutorial assignments.

This unit focuses on the nature of agricultural and resource commodity markets, market demand relationships, market supply relationships, price determination under alternative market structures, marketing margin relationships, derived demand for inputs, spatially and temporally related markets, market dynamics, price expectations, commodity futures markets and other pertinent topics. Applied examples from the agricultural and resource industries and the overall economy will be used throughout the semester as illustrations of the principles involved.

N.B. Available to 2nd year students in Faculty of Economics and Business.

Advised prerequisite: AGECE2105 or ECMT2110

### AGEC2102

#### Agribusiness Marketing

**Credit points:** 6 **Teacher/Coordinator:** Ms Elizabeth Nolan **Session:** Semester 1 **Classes:** (2 lec, 1 tut)/wk **Prerequisites:** AGECE1006 or (AGECE1003 and AGECE1004) or AGECE1002 or AGECE1102 or RSEC1031 or AGECE1031 **Assessment:** One mid semester exam, group presentation, case study, final exam

This unit of study is designed to provide an introductory understanding of agribusiness marketing in a modern context. The unit will provide students in the Sciences degrees with an understanding of how the economic theory taught in first year in AGECE1006 can be treated in an applied context. For BAgEc students, it is an intermediate level unit in the Agribusiness major.

Students will study the theory relating to the firm-level marketing mix and marketing strategy, decision making, marketing management and planning, market research and information. The unit of study will also address the organisation and trends of agribusiness marketing including value-adding and market power in the supply chain, market efficiency and international marketing by agribusiness firms.

The unit content is analytical, and draws on applied microeconomics to demonstrate how marketing decisions are made along the marketing chain. At the end of this unit students will be able to use marketing theory to analyse the steps in the marketing chain and be aware of the forces for change within that chain.

By completing this unit, students should have improved their ability to master key theories, identify and frame problems, organise knowledge, carry out individual and group research, and synthesise information. They should also have improved their information literacy skills, and communication skills through group presentations and individual research.

#### Textbooks

Schaffner, DJ, Schroder, WR and Earle, MD (2003). Food Marketing: An international Perspective, 2nd Edition, McGraw-Hill.

### AGEC2103

#### Production Economics

**Credit points:** 6 **Teacher/Coordinator:** Dr. Paulo Santos **Session:** Semester 1 **Classes:** (1 lec, 1 tut)/wk **Prerequisites:** AGECE1102 or AGECE1006 or (AGECE1003 and AGECE1004) or RSEC1031 **Prohibitions:** AGECE2003 **Assessment:** 1 mid sem exam (50 mins), 1 end sem exam (2hrs), 1 assignment.

This unit builds on microeconomic principles studied in first year and applies them to the analysis of firms' decisions. Emphasis is put on the formalization of the firm's problem and in the use of duality. The topics include: production functions (single and multi-output); distance functions and their use in the measurement of productivity; the decomposition of productivity and productivity changes; production under risk; cost and profit functions.

N.B. Available to 2nd year students in the Faculty of Economics and Business

#### Textbooks

Collection of readings

### AGEC2105

#### Applied Econometric Modelling

**Credit points:** 6 **Teacher/Coordinator:** Ms Shauna Phillips **Session:** Semester 1 **Classes:** (2 lec, 1 tut)/wk **Prerequisites:** (ECMT1010 and ECMT1020) or (MATH1001 and MATH1002 and MATH1003 and MATH1005) or BIOM1003 or RSEC1031 **Prohibitions:** AGECE2005 **Assessment:** 1 mid semester exam (50 mins), 1 end semester exam (2hrs), 1 assignment.

Applied Econometric Modelling is designed to provide students with a sound understanding of the application of applied econometric methods to the agricultural and resource sectors. Topics covered will include: single and multiple regression, forecasting, dummy variables, violations of OLS assumptions, dynamics, binary choice models, and an introduction to cointegration. Emphasis will be placed on developing the ability to estimate and interpret economic relationships. The computing side of the unit involves the use of the statistical package EViews.

This unit of study is designed to develop student understanding and capability in applied regression analysis.

It is a core unit for students in BAgEc and BResEc, students and a non core unit for BScAgr students.

Students will become familiar with exploring data sets and estimating, interpreting, and assessing regressions that represent economic relationships.

At the end of this unit, students will be able to understand the major concepts and principles of applied regression analysis, estimate simple regressions in EViews and interpret the output, and be able to read, understand, and possibly replicate recent literature in agricultural and resource economics journals that apply econometric methods.

The students will gain research and computing skills.

#### Textbooks

D.N. Gujarati, Essentials of Econometric, 3rd Ed. (McGraw-Hill Irwin), New York.

### AGEC3101

#### Agribusiness Management

**Credit points:** 6 **Teacher/Coordinator:** Ms Lynn Henry **Session:** Semester 2 **Classes:** (2 lec, 2 wkshp)/wk **Prerequisites:** AGEC2103 or AGEC2003 or AGEC1006 or (AGEC1003 and AGEC1004) **Prohibitions:** AGEC1102; AGEC3103; AGEC3001 **Assessment:** One mid semester exam (1 hour), one final exam (2 hours), workshop papers and assignment.

This unit of study is designed to introduce decision making problems encountered by firms and agribusiness firms and general methods of solving microeconomic decision making problems. It is unit of study that builds on knowledge gained in junior units of study in particular AGEC1006, AGEC2103 and AGEC2102. Students will review production economics and activity analysis and show how budgeting methods can be used to relate them. They will extend these budgeting techniques to problems of time and risk, using capital and parametric budgeting. Students will also be introduced to linear programming and show how this tool is a practical method of solving decision making problems. Students will learn to consider methods for solving decision making problems where the outcomes are not known with certainty. The students will gain skills through workshop based tasks, an assignment, information literacy and communication skills through the presentation of the workshop reports and discussion throughout the workshop.

### AGEC3102

#### Agricultural and Resource Policy

**Credit points:** 6 **Teacher/Coordinator:** Dr. Paulo Santos **Session:** Semester 1 **Classes:** (1 lecture, 1 tutorial)/wk **Prerequisites:** (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) **Prohibitions:** AGEC3002 **Assessment:** Assignments, fieldwork.

This unit covers the theoretical framework for economic analysis of policy interventions (welfare economics and public choice theory). Emphasis is put on building the skills needed to analyze the incidence of economic policy and on the design of policies under asymmetric information. An understanding of the institutional structure of agricultural and resource policy in Australia is promoted through the direct contact with policy makers, public agencies and lobbying groups.

N.B. Available to 3rd year students in the Faculty of Economics and Business

#### Textbooks

John McMillan, 2002, Reinventing the Bazaar. A natural history of markets. W.W. Norton, and collection of articles.

N.B. Students are advised not to buy the textbooks before lectures commence in case there are any changes.

### AGEC3103

#### Applied Optimisation

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Ross Drynan **Session:** Semester 1 **Classes:** (2 lec & 2 tut)/wk **Prerequisites:** (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) **Prohibitions:** AGEC3101 **Assessment:** One end-of-semester exam (2 hours), assignments, class work.

This unit of study deals with constrained optimization problems in which one or more constraints are inequalities. Such problems are explored/solved by "mathematical programming" techniques. The main focus of the unit is on linear programming (LP) problems, i.e. ones in which both the objective and the constraints are linear functions, and its application in agricultural and other planning contexts. Topics include graphical and mathematical representation of LP problems, solution methods, solution information, stability of optimal solutions, primal and dual formulations and parametric programming. After covering the basics of LP, the focus shifts to modelling real world scenarios as optimization problems. Students are streamed: one group deals with specialized LP formulations (e.g. transportation model) and extensions of LP (e.g. integer programming). The other examines dynamic optimization for problems that involve inter-temporal resource allocation. Students develop experience and confidence in the use of spreadsheet-based optimizer routines, and with specialised optimization packages (e.g. LINDO).

### AGEC3104

#### Research Methods

**Credit points:** 6 **Teacher/Coordinator:** Ms. Elizabeth Nolan **Session:** Semester 2 **Classes:** (2 lec & 1-2 hr tut)/wk **Prerequisites:** AGEC2105 or ECMT2010 or ECMT2110 or AGEC2005 **Prohibitions:** AGEC3004 **Assessment:** One final exam, assignments, research proposal.

This unit deals with the nature of research and inquiry in applied economics. Topics covered will include: alternative philosophical perspectives on inquiry; scientific method; research as an orderly process of enquiry; preparation of research proposals; secondary data sources for agricultural and resource economists; collection of primary data; statistical design of sample surveys; questionnaire construction; interviewing techniques; and methods of analysis of survey data. Topics are illustrated with examples of research in theoretical economics, empirical research, empirical exploratory research, and research using policy-evaluation modelling. Students are expected to read widely. Development of practical research skills, including the ability to critically and statistically synthesise and interpret data will be fostered by the completion of applied computer-based workshop exercises. Information literacy skills and the ability to summarise and synthesise information and use it to inform an argument will be improved through the preparation of a literature review and a research proposal.

### AGEC4102

#### Agricultural Development Economics

**Credit points:** 6 **Teacher/Coordinator:** Dr. Paulo Santos **Session:** Semester 2 **Classes:** (2 lectures)/wk **Prerequisites:** (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) **Assessment:** Assignments

This unit focuses on the microeconomic analysis of development, with a special emphasis on the importance of market failures in financial markets as origin of persistent poverty. The unit also addresses policy interventions to overcome such failures and the challenges in their evaluation. A special emphasis is put in the discussion of the role of agriculture in development, and the evidence supporting its importance in poverty reduction.

#### Textbooks

Debraj Ray, Development Economics, Princeton University Press.

Abhijit Banerjee, Roland Bénabou and Dilip Mookherjee, Understanding Poverty, Oxford University Press.

World Bank, Agriculture for Development - World Development Report 2008, World Bank and Oxford University Press

N.B. Students are advised not to buy the textbooks before lectures commence in case there are any changes.

### AGEC4104

#### Agribusiness Analysis

**Credit points:** 6 **Teacher/Coordinator:** Dr. Shyamal Chowdhury **Session:** Semester 1 **Classes:** (2-3 hours lec & 1x1 hour tut)/wk **Prerequisites:** (AGEC2001 or AGEC2101) and (AGEC2003 or AGEC2103) **Assessment:** One mid semester exam (1 hour), one final exam (2 hours), case studies.

This unit focuses on applications of economic theory and methods in agribusiness decision making. It provides advanced treatment of the industrial organisation of agribusiness firms. Case studies will be used to examine the economic complexities of global agribusiness systems. Extensive readings make up the central component of the unit.

#### Textbooks

Collections of readings.

### AGEC4107

#### Special Topics

**Credit points:** 6 **Teacher/Coordinator:** Dr. Paulo Santos **Session:** Semester 1, Semester 2 **Classes:** Individual research and consultation **Prohibitions:** AGEC4007 **Assessment:** Research paper.

*Note: Department permission required for enrolment.*

This unit deals with the specialised areas of agricultural and resource economics of particular interest to approved students. The student will read under the guidance of a member of staff and complete designated learning tasks.

#### Textbooks

Individual reading.

### AGEC4108

#### Quantitative Planning Methods

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Ross Drynan **Session:** Semester 2 **Classes:** (2 lec & 2 tut/lab session)/wk **Prerequisites:** AGECE3101 or AGECE3103 or AGECE3031 or AGECE3001 **Prohibitions:** AGECE4008 **Assessment:** One end-of-semester exam (2 hours), 2 assignments.

This unit examines the use of mathematical methods and models in planning at both the individual firm level and the sector level. While the principal focus is on formal optimization, simulation and Monte Carlo methods are briefly discussed. Topics include non-linear programming, elements of input-output analysis, computable general equilibrium analysis, dynamic problems and methods (e.g. dynamic programming and optimal control). Sectoral level planning applications considered include transportation and plant location studies; spatial equilibrium; and resource utilization across time. Firm level applications include multi-period planning, queuing problems, inventory analysis, and replacement problems. Extensive use is made of computer-based optimization.

### AGEC4112

#### Research Project A

**Credit points:** 9 **Teacher/Coordinator:** Dr. Paulo Santos **Session:** Semester 1 **Classes:** 1 seminar/wk **Prerequisites:** 2 units out of AGECE3102, AGECE3103, AGECE3104 or AGECE3004 **Corequisites:** AGECE4113 **Prohibitions:** AGECE4012 **Assessment:** Research report and presentation.

*Note: Department permission required for enrolment. Note:*

In this unit of study, students develop their ability to undertake a research project in economics. The unit builds on theoretical and applied knowledge gained throughout the degree. Each student will develop a well defined research project in close collaboration with an academic supervisor. In addition to improving their research skills through the design and report on a single research study, students will improve their communication skills through oral presentation of their work.

### AGEC4113

#### Research Project B

**Credit points:** 9 **Teacher/Coordinator:** Dr Paulo Santos **Session:** Semester 2 **Classes:** 1 Seminar/wk **Prerequisites:** 2 units out of AGECE3102, AGECE3103, AGECE3104 or AGECE3004 **Corequisites:** AGECE4112 **Prohibitions:** AGECE4013 **Assessment:** Research report and presentation.

*Note: Department permission required for enrolment. Note:*

This unit of study is taken in conjunction with the companion unit, AGECE4112 Research Project A. See AGECE4112 for details.

### AGEC4121

#### Research Exercises A

**Credit points:** 9 **Teacher/Coordinator:** Dr. Paulo Santos **Session:** Semester 1 **Classes:** (2 lec or sem)/wk **Prerequisites:** 2 units out of AGECE3102, AGECE3103, AGECE 3104 or AGECE3004 **Corequisites:** AGECE4122 **Prohibitions:** AGECE4012, AGECE4112 **Assessment:** Written research report/paper(s), seminars.

This unit of study is taken in conjunction with the companion unit, AGECE4122 Research Exercises B. Students develop skills in economic research by participating in the designing, undertaking and reporting on one or more research exercises undertaken under the guidance of a staff member. Students may work individually and/or in groups on a project that is common to the entire class. Students may be required to work on separate aspects of that project or may be required to examine the same aspect using different approaches. Students will be required to prepare individual and/or group written reports and/or oral presentations concerning data acquisition, analysis and interpretation of results.

### AGEC4122

#### Research Exercises B

**Credit points:** 9 **Teacher/Coordinator:** Dr Paulo Santos **Session:** Semester 2 **Classes:** (2 lec or sem)/wk **Prerequisites:** 2 units out of AGECE3102, AGECE3103, AGECE 3104, or AGECE3004 **Corequisites:** AGECE4121 **Prohibitions:** AGECE4013, AGECE4113 **Assessment:** Written research report/paper(s), seminars.

This unit of study is taken in conjunction with the companion unit, AGECE4121 Research Exercises A. See AGECE4121 for details.

### AGRO3004

#### Managing Agro-Ecosystems

**Credit points:** 6 **Teacher/Coordinator:** Dr Carina Moeller, Dr Brett Whelan, Prof John Crawford, Prof Richard Trethowan, Dr Daniel Tan **Session:** Semester 2 **Classes:** (2hrs lec, 3hrs field and computer lab pracs)/wk **Prerequisites:** PLNT2003 or PLNT2903 **Assumed knowledge:** AFNR1001, AFNR1002, SOIL2003, and BIOM1003 **Assessment:** Quizzes, field practical report, exam.

The most critical and interesting questions managers of natural resources face deal with the inherent complexity of agricultural systems. Long- and short-term interactions exist between physical (e.g. climate, soil) and biological (crops and other organisms) factors, and the agricultural management, among others. Understanding these interactions and their impacts on production and environmental outcomes in dryland agricultural systems is the overall aim of this unit. AGRO3004 is a core unit for BScAgr students and builds on knowledge and skills gained in the junior units AFNR1001, AFNR1002, AVBS1002, PLNT2003, SOIL2003, and BIOM1003. This unit investigates dryland agro-ecosystems, which can be defined as ecosystems modified for the purpose of producing crops in environments where water limits productivity during part of the year. During the semester, principles of crop and pasture production, integrated pest management, approaches to managing climate variability and precision agriculture are introduced. There will be a focus on understanding effects of climate and weather in dryland systems, especially on understanding crop-water relationships. Attention will be paid to biodiversity and the sustainability of agro-ecosystems. The unit provides an opportunity to develop key graduate attributes for agricultural scientists in information literacy, field experimentation, critical analysis, written expression, and team work.

#### Textbooks

Pratley J (Ed.) (2003) 'Principles of field crop production (4 edn).' (Oxford University Press: Melbourne, Australia).

### AGRO4003

#### Crop and Pasture Agronomy

**Credit points:** 6 **Teacher/Coordinator:** Dr Lindsay Campbell **Session:** Semester 1 **Classes:** Tutes, intensives/workshops, excursion (February) **Prerequisites:** AGRO3004 or PLNT2003 or PLNT2903 **Assessment:** Report, oral presentation and exam.

This unit examines agronomy as the discipline that underpins agricultural production. As a case study, the cotton industry is examined in detail to understand the end-user and social demands on agricultural production, the technical issues that challenge the farmer and the diversity of other specialist information from relevant disciplines such as entomology, pathology and soil science that must be integrated into the farming system. Likewise the rice and/or pastoral industries provide a contrasting farming system as another case study. The unit includes a one-week excursion to cotton growing areas in northern NSW and Qld, specialist intensive instruction provided by the Cotton CRC and a series of workshops, tutorials that provides analysis and synthesis of the major farming systems in this industry. Pasture production is also considered in the context of farming systems.

### AGRO4004

#### Sustainable Farming Systems

**Credit points:** 6 **Teacher/Coordinator:** Dr Lindsay Campbell **Session:** Semester 1 **Classes:** Negotiated practicals and workshops (63h) **Prerequisites:** AGRO3004 **Assessment:** Reports.

This unit is designed to provide students with training in the professional skills required to practice agronomy. The unit principally builds on theoretical and applied knowledge gained in third year agronomy (AGRO3004) and second year plant physiology (PLNT2003). In this unit students will integrate their knowledge of soils, plant pathology, entomology, experimental design, biometry and economics to address applied problems in agronomy, namely the issue of sustainability. After completing this unit students should be

able to confidently design and manage a field experiment and interpret their findings by integrating knowledge from across discipline boundaries. Students will develop their ability to establish conclusions towards making recommendations for long term sustainability. By implementing and managing a major field experiment students will develop their research and inquiry skills. Team work is strongly encouraged in this unit and the integration and reporting of their findings will develop their critical thinking and written communication skills.

### AGRO4005

#### Livestock Production Systems

**Credit points:** 6 **Teacher/Coordinator:** Dr Lindsay Campbell **Session:** Semester 2 **Classes:** (Intensive lectures or workshop, fieldtrips, 1 hr case study)/wk **Prerequisites:** AGRO3004 **Assumed knowledge:** ANSC3101 **Assessment:** One 2hr exam (50%), case study reports based on field trips (40%), participation in debate (10%).

The aim of this unit is to highlight the interrelationships between livestock production, plant, soil and water resources using scientific principles and predicting the effects of management actions and environmental conditions on the system. Livestock production systems builds on knowledge in the AGRO3004, which deals with pasture and cropping systems and expands this into the management of systems involving animals. As such it integrates knowledge from all prior units in the degree and is the most senior units for students interested in Agronomy and Livestock production systems. In this unit, students will investigate and discuss how pasture management directly influences livestock production and how management of livestock systems can be a sustainable industry in terms of natural resources. The students will work in a group to research a new component in livestock management systems research and participate in a debate about intensifying or extensifying the livestock industry. Students completing this unit will be able to evaluate how the management of different pastoral systems affects the nutritional value of different pastures and sustainability of soil and water resources, and demonstrate management decision making in relation to stocking rates and pasture growth and nutrition. In addition students will contrast new and innovative animal grazing systems to more traditional systems in terms of stocking rates, live weight gain and natural resource impact and debate the ethical and scientific views of intensive animal production (such as feedlots) and extensive animal production (such as native animal and biological production) Through group work and independent research on the case studies students will gain valuable research and interpersonal skills. Writing and communication skills are developed through report and exam writing and oral communication through participation in a debate.

### ANSC3101

#### Animal Nutrition 3

**Credit points:** 6 **Teacher/Coordinator:** Dr Alex Chaves **Session:** Semester 2 **Classes:** lectures 3 hrs/week, tutorials 1 hr/week, laboratories 2 hrs/week **Prerequisites:** ANSC2002 or AVBS1002 **Assessment:** Assignments, including scientific written report (15%), oral presentation (15%), online quizzes (20%), tutorials (20%), and a final online exam (30%) **Practical field work:** 2 field trips (6 hours)

This Unit of Study builds upon principles discussed in ANSC2002 (Animal Science 2). The Unit is broadly divided into four sections, namely: estimating the nutritive characteristics of feeds; defining the nutrient requirements of animals; diet formulation; errors in feeding. The focus is on coming to an understanding of the assessment of nutritional adequacy and the avoidance and solving of nutritional problems, with a particular emphasis on animals used in agricultural production systems and wildlife. The principles discussed in this course will be expanded in the following year, in which species-specific systems will be described. The basis of successful feeding management is an understanding of the following: the composition of feeds; the digestibility and efficiency of utilisation of nutrients by the animal; the nutrient requirements of the animal; interactions between nutrients that influence health and production. And following from this, students will have the ability to formulate diets to meet animal requirements for a variety of purposes and under a variety of

constraints; identify deficiencies, excesses and imbalances in diets and so avoid a decline in productive efficiency and/or a decline in health.

#### Textbooks

Perry, TW, Cullison, AE and Lowrey RS 1998, Feeds and Feeding, 5th Edn, Prentice Hall, New Jersey  
Tisch, D 2005 Animal Feeds, Feeding and Nutrition, and Ration Evaluation CD-ROM, Delmar Cengage Learning, New York  
Dryden, G. 2008, Animal Nutrition Science, CABI, Cambridge MA  
Sauvant, D., Perez, J-M and Tran, G. (eds.) 2004, Tables of Composition and Nutritional Value of Feed Materials: Pigs, Poultry, Cattle, Sheep, Goats, Rabbits, Horses, Fish, INRA, Wageningen

### ANSC3102

#### Animal Reproduction

**Credit points:** 6 **Teacher/Coordinator:** Dr Chris Grupen **Session:** Semester 1 **Classes:** lectures 2 hrs/week, tutorials 1 hr/week, practicals 3 hrs/week **Assumed knowledge:** ANSC3104 **Assessment:** written and oral assignments 25%, mid-semester written exam 15%, end of semester written exam 60%

This unit of study provides a comprehensive programme on basic and applied aspects of male and female reproductive biology, with particular emphasis on livestock and domestic animals. The fundamental topics include reproductive cycles, sexual differentiation, gametogenesis, fertilisation, embryo development, gestation and parturition. An understanding of the applications of advanced reproductive technologies is developed through lectures, tutorials and the assignments. In addition, practical instruction is given on semen collection and processing, manipulation of the reproductive cycle, artificial insemination, and pregnancy diagnosis in sheep. Classes are held at the Camperdown Campus in Sydney and at the Camden Campus Animal Reproduction Unit in Cobbitty.

#### Textbooks

Hafez, B & Hafez, ESE (eds) 2000, Reproduction in farm animals, Lippincott Williams and Wilkins  
Senger, PL 2003, Pathways to pregnancy and parturition, 2nd edn, Current Conceptions Inc

### ANSC3103

#### Animal Structure and Function A

**Credit points:** 6 **Teacher/Coordinator:** Dr Melanie Collier **Session:** Semester 1 **Classes:** lectures 3hrs/wk, laboratories/tutorials 3hrs/wk (note these will vary depending upon the week) **Prerequisites:** 12 credit points of junior biology **Assumed knowledge:** AVBS1002 **Assessment:** assignments/presentations (45%), theory exam (55%)

Animal Structure and Function A will develop an understanding of the role of the body systems in maintaining homeostasis in an animal's internal environment. In ASFA the structure and function of the cardiovascular, respiratory, central nervous and urinary systems of the body are explored in depth particularly with reference to the maintenance of homeostasis and an animal's perception of, and response to, its environment. The developed understanding of the normal functioning of these systems allows identification of the impact on the animal of abnormal function of these systems. A study of the structure and function of muscle will include its role in movement and as meat in a production setting. The overall goals of the Unit are (i) to enable students to develop a rich understanding of the relationships between body systems and structures (to be continued in ASFB). (ii) to develop generic skills particularly in oral presentation, (iii) to develop an appreciation of the links between structure and function and their relevance to animal disease and production that will be further developed in Veterinary Pathogenesis as well as in advanced, applied studies in Behaviour in third year and in 4th year Animal Production.

#### Textbooks

The recommended textbook: for the animal structure component of the unit is: Dyce, KM, Sack, WO & Wensing, CJG 2002, Textbook of veterinary anatomy, 3rd edn, W.B.Saunders, Philadelphia  
For the physiology component of this unit:  
Sherwood, L, Klandorf, H and Yancey, P H ( 2005) Animal Physiology: From Genes to Organisms, Thomson Brooks Cole, Belmont CA  
A handbook containing details of lecture outlines, objectives, reference lists, details of practical classes, staffing as well as other relevant class material will be available for students to purchase

## ANSC3104

### Animal Structure and Function B

**Credit points:** 6 **Teacher/Coordinator:** Dr Cathy Herbert **Session:** Semester 2 **Classes:** lectures 3 hrs/wk, laboratories/tutorials 3 hrs/wk, activities will vary on a weekly basis **Prerequisites:** ANSC3103 **Assumed knowledge:** AVBS1002 **Assessment:** anatomy dissection project 20%, topic test 10%, critical review 20%, final exam 50%

In this Unit students will complete the study of the structure and function of organ systems in animals started in ANSC3103. The role of hormones and the immune systems will be investigated in relation to maintenance of internal homeostasis. An introduction to digestion and male and female reproductive anatomy and physiology will form the basis for further applied studies in these areas in third year Units of Study in Animal Nutrition and Animal Reproduction. There will be development of the generic skills of critically reading and writing.

#### Textbooks

For Animal Structure:

Dyce, KM, Sack, WO & Wensing, CJG 2002, Textbook of veterinary anatomy, 3rd edn, W.B.Saunders, Philadelphia

For Animal Function:

Sherwood, L, Klandorf, H and Yancey, PH 2005. Animal Physiology. From Genes to Organisms. Thomson Brook Cole

## AVBS1002

### Concepts of Animal Management

**Credit points:** 6 **Teacher/Coordinator:** Mrs Irene Van Ekris **Session:** Semester 2 **Classes:** 6 hrs/week (lectures and practicals) **Prerequisites:** 6 credit points of junior Biology **Assessment:** practical class testing (20%), written assignments (15%), written exams (65%) **Practical field work:** There will be several whole day practical classes at the Camden campus

This unit will explore the management of animals in natural and man-made environments. At the end of this unit of study, student will understand: The characteristics of the management systems of the major domestic species used for production in Australia and in a world wide context; the characteristics and principles underpinning sustainable management of native animals in natural and man-made environments; an appreciation of the dependence of living organisms upon their environment; an appreciation of the husbandry practices and innovations that have been adopted by the production industries to retain their competitive advantage; a demonstrated capability in handling and husbandry of the major domestic production animal species, and an appreciation of the application of these skills to non-domestic species; a demonstrated understanding of the importance of high standards of animal welfare practice in the management of animals.

#### Textbooks

There is no single text that adequately covers the unit content and for this reason no formal text is required. Where appropriate, relevant reference material will be identified for specific area of the course.

## AVBS4002

### Dairy Production and Technology

**Credit points:** 6 **Teacher/Coordinator:** Dr Yani Garcia **Session:** Semester 2 **Classes:** lectures 2 hrs/wk, practicals 3 hrs/wk **Prerequisites:** ANSC3101, (Animal and Veterinary Bioscience years 1-3 OR Bachelor of Science in Agriculture years 1-3) **Assumed knowledge:** Enrolled students are expected to have some understanding of key components of the dairy production system, including basic knowledge of animal physiology and nutrition. **Assessment:** Whole farm professional report (30%), pracs assessments, (20%), 2 hr exam (50%) **Practical field work:** Two or three visits to commercial dairy farms in NSW

This unit will explore the various aspects of dairy farming and the dairy industry from a scientific point of view. The lectures are a mix of the principles on which sound dairy farming is based and practical example of how this operates in practice. The course is not meant to provide a set of methods on dairying to be used as recommendations. Instead, focus is placed on integrating knowledge to gain understanding on the system of production as a whole.

At the end of this unit of study, students will demonstrate a solid understanding of: the characteristics of the dairy industry in Australia and in a world wide context; the key components of pasture-based dairy systems; principles and practices of pasture and feeding

management; the application of new technologies to improve efficiency and productivity, (particularly automatic milking).

In addition, students will demonstrate an appreciation of key aspects of reproduction and lactation physiology; the integration of knowledge of genetics and reproduction into the type of herd improvement structure set up in the dairy industry; the application of ruminant physiology knowledge to developing feeding programs for dairy cows; the extension of basic reproductive physiology onto the dairy farm using case studies as examples; the economics of the dairy farm business. Practical classes include milking cows; grazing and feeding management of dairy cows; calf rearing; and several visits to commercial farms ranging from small pasture-based dairy farms to a feed-lot operation milking over 2,000 cows.

#### Textbooks

There is no single text that adequately covers the course content and for this reason no formal text is required. However, the following books can be used as basic bibliography for consultation during the course:

Milk Production from Pasture (CW Holmes et al 2002)

Feeding the dairy cow (Chamberlain and Wilkinson 1996)

Where appropriate, relevant reference material will be identified for specific areas of the course.

## AVBS4008

### Intensive Animal Industries

**Credit points:** 6 **Teacher/Coordinator:** Dr Jeff Downing **Session:** Semester 2 **Classes:** Lectures 3 hrs/week, practicals 3 hrs/week **Prerequisites:** (Animal and Veterinary Bioscience years 1-3) OR (Bachelor of Science in Agriculture years 1-3) **Prohibitions:** AVBS4006, AVBS4007 **Assessment:** Written exam (50%) (Poultry and Pigs 50:50), Practical report and in-course evaluations (25% Pigs), Broiler growth study and in course evaluations (25% Poultry) **Practical field work:** Visits to an intensive pig farm, feed mill and poultry production and processing units

This unit of study is composed of two parts, a Poultry Production component and a Pig Production component. The course will provide students with a comprehensive overview of the production of eggs and poultry meat and pork. The individual components examine various aspects of the poultry and pig production systems important in maintaining efficiency and profitability. It investigates aspects of breeding, nutrition, housing, growth performance, health, welfare, reproductive capability, waste management, marketing and current industry issues. This unit will expand on some aspects of previous year 3 units of study in animal structure and function, nutrition and reproduction.

#### Textbooks

There is no single text that adequately covers in Australian pig industry and for this reason no formal text is required. There are many sites (industry, academic institutions and government departments) on the Web which provide excellent information. Links to these will be provided. Where appropriate, relevant reference material will be identified for specific areas of the course. Often poultry specific text books are obsolete very quickly, it would be important to learn to identify trade information (the library subscribes to breeder management guides and product expectations; equipment web-sites, etc) and scientific journals as resources.

## AVBS4009

### Aquaculture

**Credit points:** 6 **Teacher/Coordinator:** Dr Joy Becker **Session:** Semester 1 **Classes:** Lectures 2hrs/wk, tutorials 1hr/wk, practicals 3hrs/wk **Prerequisites:** Animal and Veterinary Bioscience years 1-3 OR Bachelor of Science in Agriculture years 1-3 **Assessment:** written and/or oral assignments (35%), written practical report (30%), exam 2 hrs (35%)

The Unit of Study explores in detail aspects of commercial aquaculture, including global trends in aquaculture development. Other topics include water quality, feeding, management, health and disease, genetics and reproduction, environmental impact and economic constraints to production. The unit of study emphasises methods to improve aquacultural productivity. It builds on basic principles of anatomy, physiology, nutrition, genetics and health and disease presented in other units of study in BAnVetBioSc.

At the end of this Unit of Study, students will demonstrate an understanding of the principles of: the context of aquaculture in global food production; husbandry, management and welfare of aquaculture species; comparative aspects of husbandry in aquaria, domestic, commercial; health and disease relevant to aquaculture; nutrition of



aquaculture species; reproduction and genetics of species in aquaculture; water quality and environmental impact of aquaculture; economics and marketing of aquaculture products.

### AVBS4012

#### Extensive Animal Industries

**Credit points:** 6 **Teacher/Coordinator:** Dr Russell Bush **Session:** Semester 1 **Classes:** lectures 3hrs/wk, practicals 3hrs/wk **Prerequisites:** Animal and Veterinary Bioscience years 1-3 OR Bachelor of Science in Agriculture years 1-3 **Prohibitions:** AVBS4010, AVBS4011 **Assessment:** case study (10%), practical report (20%), meat grading (10%), excursion report (20%) and written exam (40%)

This unit introduces the concepts of sheep and beef cattle production in the Australian environment within the context of world food and fibre consumption and production. The key products and domestic and export markets for these are presented. The course then provides an historical perspective of the basis for each of these industries and then describes each of the production systems designed to meet the demand for these products. These will cover production in both the tropical and temperate regions of Australia and include the key elements of extensive grazing and intensive feedlot systems. Major issues will include breeds and breeding systems, basic nutrition and production practices and animal welfare issues as they affect the quality and quantity of product marketed. The concepts of first stage processing of both meat and fibre products in abattoirs and top-making plants respectively will be presented. The grading of products based on quality factors.

The major factors that influence the quality of product and therefore market demand will be presented. Lecture material will be supported with a 5 day study tour to the Riverina to evaluate different commercial production systems, appropriate practical classes and student presentations.

#### Textbooks

Anderson RS, Edney ATB 1991 Practical animal handling, Pergamon Press  
Battaglia RA 2001, Handbook of livestock management, Prentice Hall  
Lawrie, RA 1980, 1981, Developments in meat science, vols 1&2, Applied Science Publishers  
Lawrie, RA 1985, 1988, 1991, Developments in meat science, vols 3-5, Elsevier Applied Science  
Ensminger, ME & Perry RC 1997, Beef cattle science, Interstate Publishers  
Temple, G 2000, Beef cattle handling and facilities design, Grandin Livestock Systems, Fort Collins, Colo  
Cottle, DJ 2000, Australian sheep and wool handbook, WRONZ Developments, Christchurch  
Massy, C 1990 The Australian merino, Viking O'Neil

### BIOL1001

#### Concepts in Biology

**Credit points:** 6 **Session:** Semester 1, Summer Main **Classes:** Three 1 hour lectures and one 4 hour practical per fortnight. **Prohibitions:** BIOL 1911 **Assumed knowledge:** None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). **Assessment:** One 2 hour exam, assignments, quizzes.

*Note: It is recommended that BIOL (1001 or 1911) be taken concurrently with either BIOL1003 or BIOL1903. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.*

Concepts in Biology is an introduction to the major themes of modern biology. The unit emphasizes how biologists carry out scientific investigations, from the cellular/molecular level to the level of ecosystems. Topics covered in lectures and practicals include: introductory cell biology, with particular emphasis on how cells obtain and use energy; the diversity and biology of microorganisms; an introduction to molecular biology through the role of DNA in protein synthesis, including current developments in DNA technology; genetics or organisms; theories of evolution and phylogenetic analysis, and how they are used to interpret the origins of the diversity of modern organisms; and interactions between organisms in biological communities, with emphasis on Australian ecology.

#### Textbooks

Knox R B et al. Biology, 3rd ed. McGraw-Hill. 2005

### BIOL1002

#### Living Systems

**Credit points:** 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 3 hour practical per week. **Prohibitions:** BIOL1902 **Assumed knowledge:** HSC 2-unit Biology. Students who have not completed HSC biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). **Assessment:** One 2 hour exam, assignments, quizzes.

*Note: It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.*

Living Systems deals with the biology of organisms, from bacteria to large plants and animals, and emphasises the ways in which they can live in a range of habitats. The importance of energy in living systems, and how elements are used and recycled in biological communities, are described. The unit of study includes lectures and laboratory classes on the physiology of nutrition and growth, basic physiological processes of animals and plants, the ways in which organisms control and integrate their activities, and their reproduction. Finally applications of knowledge of genetics and ecology to practical problems in agriculture and conservation are introduced.

#### Textbooks

Knox R B et al. Biology. 3rd ed. McGraw-Hill. 2005

### BIOL1902

#### Living Systems (Advanced)

**Credit points:** 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 3 hour practical per week. **Prerequisites:** UAI (or ATAR equivalent) of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. **Prohibitions:** BIOL1002 **Assessment:** One 2 hour exam, assignments, quizzes, independent project.

*Note: Department permission required for enrolment.*

This unit of study shares lectures and practical classes with BIOL1002 but also includes more demanding alternative components of Living Systems.

#### Textbooks

As for BIOL1002.

### BIOL1911

#### Concepts in Biology (Advanced)

**Credit points:** 6 **Session:** Semester 1 **Classes:** Three lectures and one 4 hour practical per fortnight. **Prerequisites:** 80+ in HSC 2-unit Biology (or equivalent) or Distinction or better in a University level Biology unit, or by invitation. **Prohibitions:** BIOL 1001 **Assessment:** One 2 hour exam, assignments, quizzes.

*Note: Department permission required for enrolment. Note: It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. The completion of MBLG1001 is highly recommended.*

Concepts in Biology (Advanced) builds on the main themes introduced in HSC Biology, with emphasis on current research in biology. Topics covered in lectures and practicals include: cell biology, with particular emphasis on how cells obtain and use energy; the diversity and biology of microorganisms; current developments in molecular biology, including recombinant DNA technology and the human genome project; inheritance, genetics and the origins of diversity of modern organisms; and interactions between organisms in biological communities, with emphasis on Australian ecology. Research-based lectures will expand on the general lecture topics and include current investigations of such diverse topic areas as cancer therapies, metabolic malfunction, anarchy in beehives, evolutionary studies of snake reproductive strategies, plant phylogeny and global environmental change.

#### Textbooks

As for BIOL1001.

### BIOL3009

#### Terrestrial Field Ecology

**Credit points:** 6 **Teacher/Coordinator:** Dr G Wardle **Session:** S2 Intensive **Classes:** Note: One 6 day field trip held in the pre-semester break and 4 practical classes during weeks 1-4 in Semester 2. **Prerequisites:** 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. **Prohibitions:** BIOL3909 **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussions and quiz (10%),

## 5. Undergraduate units of study

research project proposal and brief presentation (10%), sampling project report (20%), specimen collection (10%), research project report (50%).

*Note: Note: One 6 day field trip held in the pre-semester break (18 - 23 July 2010), and 4 practical classes during weeks 1-4 in Semester 2.*

This field course provides practical experience in terrestrial ecology suited to a broad range of careers in ecology, environmental consulting and wildlife management. Students learn a broad range of ecological sampling techniques and develop a detailed understanding of the logical requirements necessary for manipulative ecological field experiments. The field work incorporates survey techniques for plants, small mammals and invertebrates and thus provides a good background for ecological consulting work. Students attend a week-long field course and participate in a large-scale research project as well as conducting their own research project. Invited experts contribute to the lectures and discussions on issues relating to the ecology, conservation and management of Australia's terrestrial flora and fauna.

### BIOL3017

#### Fungi in the Environment

**Credit points:** 6 **Teacher/Coordinator:** A/Prof P McGee **Session:** S1 Intensive **Classes:** 40 hours of practicals in a two week intensive program held immediately prior to semester one (laboratory component each morning from 15-26 February 2010), plus the equivalent of 30 hours self-guided study during the semester. **Prerequisites:** 12 credit points of Intermediate Biology or Plant Science, or 6 credit points of Intermediate Biology, or Plant Science, and 6 Intermediate credit points of either Microbiology or Geography. **Prohibitions:** BIOL3917 **Assessment:** Selected from one 2 hour take home exam, laboratory and written assignments.

*Note: Dates: 15-26 February 2010. The completion of 6 credit points of MBLG units is highly recommended.*

The unit is designed to develop understanding of fungal ecology in relation to environmental and rehabilitation biology, biological control of pests and pathogens, and soil microbiology. Emphasis will be placed on the function of fungi, and the benefit provided by fungi in symbiotic interactions with plants, including mycorrhizal fungi and shoot-borne endophytes. Physiological and ecological implications of the interactions will also be considered. Each student will design and implement a research project. Analytical thinking and research-led activity will be encouraged. Using broad scientific approaches, each student will gain the capacity to work cooperatively to find and analyse information from primary sources, develop approaches to test their understanding, and to present their work in a scientifically acceptable manner. Students will develop a deeper understanding of one area of fungal biology through independent study. Part of the learning material will be available on the internet.

### BIOL3018

#### Applications of Recombinant DNA Tech

**Credit points:** 6 **Teacher/Coordinator:** Dr B Lyon **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; up to 4 hours laboratory per week. **Prerequisites:** 12 credit points from MBLG (2071/297), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **Prohibitions:** BIOL3918 **Assessment:** One 2 hour exam, practical reports, assignment/seminar

A unit of study with lectures, practicals and tutorials on the application of recombinant DNA technology and the genetic manipulation of prokaryotic and eukaryotic organisms. Lectures cover the applications of molecular genetics in biotechnology and consider the impact and implications of genetic engineering. Topics include the cloning and expression of foreign genes in bacteria, yeast, animal and plant cells, novel human and animal therapeutics and vaccines including human gene therapy, new diagnostic techniques for human and veterinary disease, the transformation of animal and plant cells, the genetic engineering of animals and plants, and the environmental release of genetically-modified (transgenic) organisms. Practical work may include nucleic acid isolation and manipulation, gene cloning and PCR amplification, DNA sequencing and computer analysis of gene sequences, immunological detection of proteins, and the genetic transformation and assay of plants.

### BIOL3917

#### Fungi in the Environment (Advanced)

**Credit points:** 6 **Teacher/Coordinator:** A/Prof P McGee **Session:** S1 Intensive **Classes:** 40 hours of practical work in a two week intensive program immediately prior to semester one (laboratory component each morning from 15-26 February 2010), plus the equivalent of 30 hours self-guided study during the semester. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology and Plant Science, or 6 credit points of Intermediate Biology, or Plant Science, and 6 Intermediate credit points of either Microbiology or Geography. **Prohibitions:** BIOL3017 **Assessment:** Selected from one 2 hour take home exam, laboratory and written assignments.

*Note: The completion of 6 credit points of MBLG units is highly recommended.*

Qualified students will be encouraged to develop a research project under supervision. The content and nature of the research will be agreed on with the executive officer.

### BIOL3918

#### Applications of Recombinant DNA Tech Adv

**Credit points:** 6 **Teacher/Coordinator:** Dr B Lyon **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, and up to 4 hours laboratory per week. **Prerequisites:** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **Prohibitions:** BIOL3018 **Assessment:** One 2 hour exam, assignment/seminar

Qualified students will participate in alternative components of BIOL3018 Applications of Recombinant DNA Technology. The content and nature of these components may vary from year to year.

### CHEM1001

#### Fundamentals of Chemistry 1A

**Credit points:** 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prohibitions:** CHEM1101, CHEM1901, CHEM1109, CHEM1903 **Assumed knowledge:** There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. **Assessment:** Theory examination (70%), laboratory exercises and continuous assessment quizzes (30%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

The aim of the unit of study is to provide those students whose chemical background is weak (or non-existent) with a good grounding in fundamental chemical principles together with an overview of the relevance of chemistry. There is no prerequisite or assumed knowledge for entry to this unit of study. Lectures: A series of 39 lectures, three per week throughout the semester.

#### Textbooks

A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

### CHEM1002

#### Fundamentals of Chemistry 1B

**Credit points:** 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM (1001 or 1101) or equivalent **Prohibitions:** CHEM1102, CHEM1108, CHEM1902, CHEM1904 **Assessment:** Theory examination (70%), laboratory exercises and continuous assessment quizzes (30%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

CHEM1002 builds on CHEM1001 to provide a sound coverage of inorganic and organic chemistry. Lectures: A series of 39 lectures, three per week throughout the semester.

#### Textbooks

A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

### CHEM1101

#### Chemistry 1A

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1001, CHEM1109, CHEM1901, CHEM1903 **Assumed knowledge:** HSC Chemistry and Mathematics **Assessment:** Theory examination (70%), laboratory exercises and continuous assessment quizzes (30%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Chemistry 1A is built on a satisfactory prior knowledge of the HSC Chemistry course. A brief revision of basic concepts of the high school course is given. Chemistry 1A covers chemical theory and physical chemistry. Lectures: A series of 39 lectures, three per week throughout the semester.

#### Textbooks

A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

### CHEM1102 Chemistry 1B

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** One 3 hour lecture and 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1002, CHEM1108, CHEM1902, CHEM1904 **Assessment:** Theory examination (70%), laboratory exercises and continuous assessment quizzes (30%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Chemistry 1B is built on a satisfactory prior knowledge of Chemistry 1A and covers inorganic and organic chemistry. Successful completion of Chemistry 1B is an acceptable prerequisite for entry into Intermediate Chemistry units of study. Lectures: A series of 39 lectures, three per week throughout the semester.

#### Textbooks

A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

### CHEM1901 Chemistry 1A (Advanced)

**Credit points:** 6 **Session:** Semester 1 **Classes:** Three 1 hour lecture and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** UAI (or ATAR equivalent) of at least 95 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation **Corequisites:** Recommended concurrent unit of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1001, CHEM1101, CHEM1109, CHEM1903 **Assessment:** Theory examination (70%), laboratory exercises and continuous assessment quizzes (30%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

*Note: Department permission required for enrolment.*

Chemistry 1A (Advanced) is available to students with a very good HSC performance as well as a very good school record in chemistry or science. Students in this category are expected to do Chemistry 1A (Advanced) rather than Chemistry 1A.

The theory and practical work syllabuses for Chemistry 1A and Chemistry 1A (Advanced) are similar, though the level of treatment in the latter unit of study is more advanced, presupposing a very good grounding in the subject at secondary level. Chemistry 1A (Advanced) covers chemical theory and physical chemistry. Lectures: A series of about 39 lectures, three per week throughout the semester.

#### Textbooks

A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

### CHEM1902 Chemistry 1B (Advanced)

**Credit points:** 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent **Corequisites:** Recommended concurrent unit of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1002, CHEM1102, CHEM1108, CHEM1904 **Assessment:** Theory examination (70%), laboratory exercises and continuous assessment quizzes (30%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

*Note: Department permission required for enrolment.*

Chemistry 1B (Advanced) is built on a satisfactory prior knowledge of Chemistry 1A (Advanced) and covers inorganic and organic chemistry. Successful completion of Chemistry 1B (Advanced) is an acceptable prerequisite for entry into Intermediate Chemistry units of study. Lectures: A series of about 39 lectures, three per week throughout the semester.

#### Textbooks

A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

## Commercial Law units of study

For CLAW units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

### CLAW1001 Foundations of Business Law

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Early **Classes:** 2hrs of lectures and 1 tutorial per week **Assessment:** Exam, Mid-Semester Test, Tutorial Assessment, Case Analysis

This unit of study is concerned with the fundamental elements of business law. It commences with an overview of the Australian legal system (sources of law, parliament, courts, statutory interpretation, doctrine of precedent), including an examination of those provisions in the Commonwealth Constitution relevant to business and commercial activities. The unit continues with a detailed study of those aspects of the law of contract that underlie all commercial transactions and are the essence of commercial law (formation of contract, terms of a contract, factors affecting the validity and enforcement of contracts, termination, remedies for breach of contract). Some aspects of the law of agency, criminal law and the law of torts (in particular, negligence and negligent misstatement) are introduced. The unit concludes with an examination of some of the key provisions of the Trade Practices Act 1974 (Cth) including those relating to misleading and deceptive conduct and manufacturers' liability.

### CLAW1002 Commercial Transactions B

*This unit of study is not available in 2010*

**Credit points:** 6 **Session:** Semester 2 **Classes:** 2hrs of lectures and 1 tutorial per week **Prerequisites:** CLAW1001 **Assessment:** Final exam, tutorial participation, optional mid semester exam, optional tutorial hand in, optional assignment

Commerce today covers a diverse range of items - from securities to patents and all forms of property in between. An understanding of what the forms of property are and how to gain or sell an interest is essential to everything from tax through marketing to e-commerce. This unit provides a detailed overview of the types of property found in standard commercial transactions and the methods for acquiring or divesting an entity with an interest in that property. The unit focuses on all forms of personal property including intellectual property and real property (land). Students will gain both an understanding of the transactions and the property as well as analytical skills in assessing and working out problems and case studies to do with commercial property.

## Econometrics units of study

For ECMT units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

### ECMT1010 Business and Economic Statistics A

**Credit points:** 6 **Session:** Semester 1, Semester 2 **Classes:** two 1-hour lectures and one 2-hour workshop per week **Prohibitions:** ECMT1011, ECMT1012, ECMT1013, MATH1015, MATH1005, MATH1905, STAT1021, ECOF1010 **Assessment:** Homework; Quizzes; Assignment; Final exam

This unit provides an introduction to basic statistics and its applications in economics and business disciplines. Topics include: methods for data management; analysis and interpretation of data; probability; the normal distribution; an introduction to sampling theory and hypothesis testing; and the concepts of regression analysis. A key component is the provision of instruction and experience in the use of computers and statistical software as an aid in the analysis of data. Students are expected to use data resources on the World Wide Web, retrieve data and analyse this data using Excel.

## ECMT1020

### Business and Economic Statistics B

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** two 1-hour lectures and one 2-hour workshop per week **Prerequisites:** ECMT1010 or ECOF1010 **Prohibitions:** ECMT1021, ECMT1022, ECMT1023 **Assessment:** Three quizzes; Workshop questions/homework; Assignment; Final exam

*Note: Other than in exceptional circumstances, it is strongly recommended that students do not undertake Business and Economic Statistics B before attempting Business and Economic Statistics A.*

This unit broadens the knowledge gained in the unit, ECMT1010 Business and Economic Statistics A by introducing further tools (and their applications) for use in economics, finance, marketing and accounting. This unit features practical applications. Possible topics include: further aspects of hypothesis testing including goodness-of-fit models; regression analysis including a brief introduction to logit models, time series and its applications to economics and finance; input-output analysis; index numbers and mathematics of finance. The material is further complemented by mathematical topics including matrices and partial differentiation. In addition, students are expected to use data resources on the World Wide Web, retrieve data and analyse this data using Excel.

## ECMT2110

### Regression Modelling

**Credit points:** 6 **Session:** Semester 1, Semester 2 **Classes:** 3 hrs per week **Prerequisites:** ECMT1010 or ECOF1010 **Prohibitions:** ECMT2010 **Assessment:** Tutorial participation/computer work; Project; Mid-Semester exam; Final exam

Students undertaking this unit have some background in basic statistics including an introduction to regression analysis. Using this knowledge as a base, an extensive discussion of basic regression theory and some of its extensions is provided. The unit covers how linear regression models can be applied to data to estimate relationships, to forecast, and to test hypotheses that arise in economics and business. Guidelines for using econometric techniques effectively are discussed and students are introduced to the process of model building. It is essential that the discussion of regression modelling be complemented with practice in analysing data. An important task is the computing component using econometric software.

## Economics units of study

For ECON and ECOS units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

## ECON1001

### Introductory Microeconomics

**Credit points:** 6 **Session:** Semester 1, Summer Main **Classes:** 1 x 2hr lecture and 1 tutorial per week **Assumed knowledge:** Mathematics **Assessment:** In-class and/or online tests, mid semester exam, essay, final exam

Introductory Microeconomics addresses the economic decisions of individual firms and households and how these interact in markets. It is a compulsory core unit for the Bachelor of Economics and Bachelor of Commerce and an alternative core unit for the Bachelor of Economic and Social Science. Economic issues are pervasive in contemporary Australian society. Introductory Microeconomics introduces students to the language and analytical framework adopted in Economics for the examination of social phenomena and public policy issues. Whatever one's career intentions, coming to grips with economic ideas is essential for understanding society, business and government. Students are given a comprehensive introduction to these ideas and are prepared for the advanced study of microeconomics in subsequent years.

## ECON1002

### Introductory Macroeconomics

**Credit points:** 6 **Session:** Semester 2, Summer Main **Classes:** 1 x 2hr lecture and 1 tutorial per week **Assumed knowledge:** Mathematics **Assessment:** In-class and/or online tests, mid semester exam, essay, final exam

Introductory Macroeconomics addresses the analysis of the level of employment and economic activity in the economy as a whole. It is a compulsory core unit for the Bachelor of Economics and Bachelor of Commerce and an alternative core unit for the Bachelor of Economic and Social Science. Introductory Macroeconomics examines the main factors that determine the overall levels of production and employment in the economy, including the influence of government policy and international trade. This analysis enables an exploration of money, interest rates and financial markets, and a deeper examination of inflation, unemployment and economic policy.

## ECOS2001

### Intermediate Microeconomics

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** 1 x 2hr lecture and 1 tutorial per week **Prerequisites:** ECON1001 **Corequisites:** ECMT1010 **Prohibitions:** ECON2001, ECOS2901, ECON2901 **Assessment:** Tutorials, 2 in-class tests, Final Exam

*Note: Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.*

The aim of Intermediate Microeconomics is the development of theoretical and applied skills in economics. It covers applications and extensions of the theory of consumer choice, firm behaviour and market structure. Emphasis is given to the economics of information and choice under uncertainty; industry structures other than monopoly and perfect competition; markets for factors of production; general equilibrium and economic efficiency; market failure and the role of government. This unit provides a basis for the more specialised options that comprise third year economics.

## ECOS2002

### Intermediate Macroeconomics

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** 1 x 2hr lecture and 1 tutorial per week **Prerequisites:** ECON1002 **Corequisites:** ECMT1020 **Prohibitions:** ECON2002, ECOS2902, ECON2902 **Assessment:** 1 Mid Semester exam, Final exam, Assignments

*Note: Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.*

This unit of study develops models of the goods, money and labour markets, examines issues in macroeconomic policy. Macroeconomic relationships, covering consumption, investment, money and employment, are explored in detail. Macro-dynamic relationships, especially those linking inflation and unemployment, are also considered. Exchange rates and open economy macroeconomics are also addressed. In the last part of the unit, topics include the determinants and theories of economic growth, productivity and technology, the dynamics of the business cycle, counter-cyclical policy and the relationship between micro and macro policy in the context of recent Australian experience.

## ECOS2901

### Intermediate Microeconomics Honours

**Credit points:** 6 **Session:** Semester 1 **Classes:** 1 x 2hr lecture and 1 tutorial per week **Prerequisites:** ECON1001 and ECON1002 with a Credit average or better in the two units of study combined **Corequisites:** ECOS2903 and ECMT1010 **Prohibitions:** ECON2901, ECOS2001, ECON2001 **Assessment:** 2 mid semester exams, Final Exam

*Note: Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.*

This unit is comprised of lectures based upon the curriculum for ECOS2001 Intermediate Microeconomics, supported by a seminar for one hour a week. The content of lectures reflect a more analytical and critical treatment of the topics than ECOS2001. The topics, which build on the theory of consumer and firm behaviour and market structure, include game theory, oligopoly, general equilibrium and welfare, externalities and public goods and the economics of information.

## ECOS2902

### Intermediate Macroeconomics Honours

**Credit points:** 6 **Session:** Semester 2 **Classes:** 1 x 2hr lecture and 1 tutorial per week **Prerequisites:** ECON1001 and ECON1002 with a Credit average or better in the two units of study combined **Corequisites:** ECMT1020

**Prohibitions:** ECON2902, ECOS2002, ECON2002 **Assessment:** Assignments, mid semester exam, Final Exam

*Note: Certain combinations of Maths/Stats may substitute for Econometrics. Consult the Chair of the Discipline of Economics.*

This unit is comprised of lectures based upon the curriculum for ECOS2002 Intermediate Macroeconomics, supported by a seminar for one hour a week. The content of lectures reflects a more intensive treatment of the topics than ECOS2002. Topics covered include: models of the goods, money and labour markets; macro-economic relationships such as consumption, investment, demand for money and labour demand and supply; macro-dynamic relationships, especially those linking inflation and unemployment; exchange rates and open economy macroeconomics; theories of economic growth; productivity and technological change; the dynamics of the business cycle; and the relationship between micro- and macro-economic policy.

### ENSY1001

#### Australian Environments and Climate

**Credit points:** 6 **Teacher/Coordinator:** Prof. Mark Adams (Coordinator) Dr Andrew Merchant **Session:** Semester 1 **Classes:** 2 lecs, 2 hrs prac/wk **Assessment:** One 2 hr exam, 2000 word essay, field and prac reports

The objective of this unit is to introduce the big questions relating to the origins and current state of the planet: climate change, environment, landscape formation, and the growth of the human population. During the semester you will be introduced to knowledge, theories and debates about how the world's physical and human systems operate. The first module investigates the system of global environmental change, specifically addressing climate variability and human impacts on the natural environment. The second module presents Earth as an evolving and dynamic planet, investigating how changes take place, the rate at which they occur and how they have the potential to dramatically affect the way we live. Finally, the third module, focuses on human-induced challenges to Earth's future. This part of the unit critically analyses the relationships between people and their environments, with central consideration to debates on global food security, climate change and agriculture.

#### Textbooks

McKnight, T., Hess, D.H. (2002) Physical geography: a landscape appreciation. Seventh Edition. Prentice Hall.

### ENSY1002

#### Ecological Sustainability

**Credit points:** 6 **Teacher/Coordinator:** Prof. Mark Adams (Coordinator) Dr Tarryn Turnbull **Session:** Semester 2 **Classes:** 2 lecs, 3 hrs prac/wk **Assessment:** One 2 hour exam, Six practical reports

Ecological sustainability lies at the heart of all discussions about sustainability in general. Unless the earth's natural systems continue to function, economic, social and many other systems will fail. This unit of study provides students with critical knowledge and understanding of the biological, chemical and physical principles that govern the key processes that define ecological sustainability. Beginning with an exploration of the meaning of sustainability and how scientific methodology is applied to its study, students will progressively engage with more complex and challenging content. By the end of the unit, students will have explored all the major elements of ecological sustainability and be able to apply their understanding to articulate critical questions that need to be asked when presented with simplistic approaches or ideas. Practical classes will focus on building skills in a few key areas and developing a greater depth of knowledge in others. Two field trips associated with the practical classes will give the students direct experience of and exposure to the science of ecological sustainability. Students will work in small groups during practical sessions, including field trips, and will be encouraged to participate in tutorial-style discussions.

#### Textbooks

A Critique for Ecology R.H. Peters, 1991, Cambridge University Press  
Biogeochemistry : An Analysis of Global Change W.H. Schlesinger 1997, Academic Press

### ENTO2001

#### Agricultural Entomology

**Credit points:** 6 **Teacher/Coordinator:** Dr Sarah Mansfield **Session:** Semester 2 **Classes:** (2x1hour lecture, 1x3hour practical, 1x1hour insect collection)/week **Assessment:** 1 x 2hr exam (50%), lab quizzes and manual (20%), 1 x insect collection (30%).

This unit is an introduction to insects, the most abundant group of organisms. The course begins with insect external and internal anatomy, feeding modes, life cycles and behaviour. Real world examples are used to demonstrate the ecological roles insects play in natural and agricultural ecosystems (e.g. pollinators, herbivores, predators, parasitoids, disease vectors). This knowledge is then linked to aspects of applied entomology: insecticides, biological control, habitat manipulation, integrated pest management, medical entomology and insect conservation. Practical sessions focus on insect morphology and taxonomy, so that students learn to identify common insect orders and families. Students must make a representative insect collection. This course forms the basis of students' entomological knowledge for BScAgr and BHortSc degrees and lays the foundation for future study in entomology.

#### Textbooks

Required: Zborowski, P. & Storey, R. 1995. A field guide to insects in Australia. Reed New Holland, Sydney. 207 pp.

Recommended: Gullan, P.J. & Cranston, P.S. 2005. The Insects: an outline of entomology. 3rd edition, Blackwell Publishing, Malden, MA. 505 pp.

### ENTO4003

#### Integrated Pest Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Sarah Mansfield **Session:** Semester 2 **Classes:** (1x2hr lec, 1x3h prac)/wk **Prerequisites:** ENTO2001 or ENTO2002 or BIOL2017 or BIOL2917 (Note: BIOL2017/BIOL2917 are only for BSc students who elect to take this UoS) **Assessment:** 1 x 2hr exam (40%), 1 x case study (20%), 1 x group assignment (20%), 1 x insect collection (20%).

The focus of this unit is the development and adoption of integrated pest management (IPM) within Australian agriculture. It builds on the knowledge gained in second year entomology (BScAgr and BHortSc) and is a core unit for the entomology specialty (BScAgr). Applied entomology deals with the control of insect pests and the use of beneficial insects. The biology of major pest (herbivores and disease vectors) and beneficial (predators, parasitoids, pollinators) insect groups is covered in depth. Students will compare the advantages and disadvantages of different pest control strategies and evaluate the importance of insect ecology, control methods and socio-economic factors to successful adoption of integrated pest management. Field trips will demonstrate the practical application of IPM concepts presented in lectures. Research, inquiry and information literacy skills will be improved through critical review of current literature and compilation of a field diary. Students will practice their communication skills and develop personal and intellectual autonomy through a group project, in-class discussion and a self-directed insect collection.

#### Textbooks

Required: Bailey, PT (Ed.) 2007. Pests of field crops and pastures. CSIRO Publishing, Collingwood, Vic. 520 pp.

Recommended: Llewellyn, R. (Ed.) 2002. The Good Bug Book. 2nd edition, Australasian Biological Control, Richmond, NSW. 110 pp.

Pedigo, LP and Rice, ME. 2009. Entomology and Pest Management, 6th edn. Pearson Prentice Hall, 784 pp.

### ENTO4004

#### Insect Taxonomy and Systematics

**Credit points:** 6 **Teacher/Coordinator:** Dr Sarah Mansfield **Session:** Semester 1 **Classes:** (1 x 2hr lec, 1 x 3hr prac)/week **Prerequisites:** ENTO2001 or ENTO2002 or BIOL2017 or BIOL2917 (Note: BIOL2017/BIOL2917 are only for the BSc students who elect to take this unit of study) **Assessment:** 1 x 2hr exam (40%), 1x museum project (25%), 1 x insect collection (25%), 1 x class participation (10%).

Knowledge of the evolutionary relationships between insect groups contributes to our understanding of insect biology and correct taxonomic identification of insects is essential for all areas of entomological research, including pest management. This unit builds on the knowledge gained in second year entomology (BScAgr and BHortSc) and is a core unit for the entomology specialty (BScAgr). Key concepts that underpin the study of insect systematics,

biogeography and phylogeny are described using examples from the evolutionary development of insects. The role of morphological, genetic and molecular studies in the classification of insects is examined. Students will demonstrate their knowledge of insect taxonomy through individual projects and assess the impact of evolutionary relationships among insect groups on modern agriculture. Research, inquiry and information literacy skills will be improved through a museum project and a self-directed insect collection. Students will practice their communication skills and develop personal and intellectual autonomy through in-class discussion of current literature.

*Textbooks*

No required text. Recommended: Naumann, I 1993. CSIRO Handbook of Australian Insect Names. 6th edition, CSIRO Entomology, Melbourne, VIC. 200 pp.  
Triplehorn, CA & Johnson, NF 2005. Borror and DeLong's introduction to the study of insects. 7th edition, Thomson Brooks/Cole, Belmont, CA, 864 pp.

**ENVI3111**

**Environmental Law and Ethics**

**Credit points:** 6 **Teacher/Coordinator:** Dr Gerry Bates Dr Jane Johnson **Session:** Semester 1 **Classes:** Two 2 hour lectures per week. **Prerequisites:** 12 credit points of Intermediate Science or Agriculture units. **Prohibitions:** ENVI3001, ENVI3003. **Assumed knowledge:** Intermediate Environmental Science. **Assessment:** Essays, tutorial papers.

This unit of study covers topics in environmental law and ethics. The environmental law component provides an overview of all laws in Australia pertaining to environmental matters and looks at a number of environmental issues at the various levels of analysis, policy making, implementation of policy, enforcement, and dispute resolution. It also provides a broad background to the political and economical issues as they relate to the legal issues involved. It also examines international environmental law, particularly examining how these influence and affect our local policies. The ethics component helps students develop thoughtful and informed positions on issues in environmental ethics using arguments derived from traditional ethics as well as environmentally specific theories. Ethical conflicts are often inevitable and difficult to resolve but using the resources of philosophical ethics and regular reference to case studies, students can learn to recognize the values and considerations at stake in such conflicts, acknowledge differing viewpoints and defend their own well considered positions.

**ENVI3112**

**Environmental Assessment**

**Credit points:** 6 **Teacher/Coordinator:** Dr John Dee Dr Scott Kable **Session:** Semester 2 **Classes:** Two 2 hour lectures per week. **Prerequisites:** 12 credit points of Intermediate Science or Agriculture units. **Prohibitions:** ENVI3002, ENVI3004. **Assumed knowledge:** Intermediate Environmental Science. **Assessment:** Essays, tutorial papers, report.

This unit of study is composed of two components: environmental impact assessment and risk assessment. The former is generally concerned with issues related to environmental impact assessment and builds toward the process of producing an EIS/EIA. More specifically it seeks to establish a critical understanding of the theory and practice of environmental impact studies/statements (EIS) and environmental impact assessment processes (EIA) from both the positive (scientific) and normative (value) perspectives. Emphasis is placed on gaining skills in writing and producing an assessment report, which contains logically ordered and tightly structured argumentation that can stand rigorous scrutiny by political processes, the judiciary, the public and the media. The risk assessment component considers a more chemical approach to the assessment of risk and issues of safety with respect to chemicals, ecotoxicology and the environment.

**ENVX2001**

**Applied Statistical Methods**

**Credit points:** 6 **Teacher/Coordinator:** Dr Thomas Bishop, Associate Prof. Inakwu Odeh **Session:** Semester 1 **Classes:** 2 1hr lectures, 1 1hr tutorial & 1 2 hr practical **Prerequisites:** BIOM1003 or MATH1011 and MATH1015 **Assessment:** Practical reports (35%), Practical exam (25%), Theory exam (40%)

This unit of study is designed to introduce students to applied statistical methods. It begins with an introduction to linear algebra which is needed to understand the statistical methods that will be introduced in the unit. The students will investigate how to analyse experiments with more than 2 treatment levels, multiple factors and different blocking designs. In the second half they will learn to model relationships between response and predictor variables using regression. In addition they will be introduced to the analysis of spatial data with geographic information science software. At the end of this unit, students will have learnt how to analyse data using ANOVA and regression, the basic methods needed for their future studies and careers. The students will gain research and inquiry skills through completion of weekly computer assignments. Information literacy and communication skills will be developed through weekly computer work.

*Textbooks*

-Mead R, Curnow RN, Hasted AM (2002) 'Statistical methods in agriculture and experimental biology.' (Chapman & Hall: Boca Raton)  
-Quinn GP, Keough MJ (2002) 'Experimental design and data analysis for biologists.' (Cambridge University Press: Cambridge, UK)

**ENVX3001**

**Environmental GIS**

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Inakwu Odeh **Session:** Semester 1 **Classes:** Four-day field trip, (2 lec & 2 prac/wk). **Assumed knowledge:** least 48 credit points in second year agriculture/science units. **Assessment:** One 15 min presentation (10%), 3500w prac report (35%), 1500w report on trip excur (15%), 2 hr exam (40%)

This unit is designed to impart knowledge and skills in spatial analysis and geographical information science (GISc) for decision-making in an environmental context. The lecture material will present several themes: principles of GISc, geospatial data sources and acquisition methods, processing of geospatial data and spatial statistics. Practical exercises will focus on learning geographical information systems (GIS) and how to apply them to land resource assessment, including digital terrain modelling, land-cover assessment, sub-catchment modelling, ecological applications, and soil quality assessment for decisions regarding sustainable land use and management. A 3 day field excursion during the mid-semester break will involve a day of GPS fieldwork at Arthursleigh University farm and two days in Canberra visiting various government agencies which research and maintain GIS coverages for Australia. By the end of this UoS, students should be able to: differentiate between spatial data and spatial information; source geospatial data from government and private agencies; apply conceptual models of spatial phenomena for practical decision-making in an environmental context; apply critical analysis of situations to apply the concepts of spatial analysis to solving environmental and land resource problems; communicate effectively results of GIS investigations through various means- oral, written and essay formats; and use a major GIS software package such as ArcGIS.

*Textbooks*

Burrough, P.A. and McDonnell, R.A. 1998. Principles of Geographic Information Systems. Oxford University Press: Oxford.  
Clarke, K. C. 2003. Getting Started With Geographic Information Systems. 4th Edition. Prentice Hall: Upper Saddle River, New Jersey.

**ENVX3002**

**Statistics in the Natural Sciences**

**Credit points:** 6 **Teacher/Coordinator:** Dr Thomas Bishop **Session:** Semester 1 **Classes:** 2 1hr workshops & 1 3 hr practical **Prerequisites:** ENVX2001 or BIOM2001 or STAT2012 or STAT2912 **Assessment:** Practical exercises (25%), Exam (50%), Major project (25%)

This unit of study is designed to introduce students to the analysis of data they may face in their future careers, in particular data that are not well behaved, they may be non-normal, there may be missing observations or they may be correlated in space and time. In the first part, students will learn how to analyse and design experiments based on the general linear model. In the second part, they will learn about the generalisation of the general linear model to accommodate non-normal data using generalised linear models. Finally, students will learn how to analyse data that is correlated in space and time. The students will learn to perform the analysis in both R and Genstat. At the end of this unit, students will have learnt a range of advanced

statistical methods and be equipped to apply this knowledge to analyse data that they may encounter in their future studies and careers. The students will gain research and inquiry skills through completion of a major project. Information literacy and communication skills will be developed through weekly computer work.

#### Textbooks

Recommended only:

-Mead R, Curnow RN, Hasted AM (2002) 'Statistical methods in agriculture and experimental biology.' (Chapman & Hall: Boca Raton)

-Quinn GP, Keough MJ (2002) 'Experimental design and data analysis for biologists.' (Cambridge University Press: Cambridge, UK)

### ENVX4001

#### GIS, Remote Sensing and Land Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Inakwu OA Odeh **Session:** Semester 2 **Classes:** 2 lec, 1tut & 4hr prac/wk (wks 1-6); Project: (wks 7-12) **Assumed knowledge:** Some knowledge of GIS and spatial information systems and/or some knowledge of soil science, geomorphology or environmental science. **Assessment:** Lab prac reports, group work, presentation and project report

*Note: Department permission required for enrolment. Note: Consent of the unit coordinator required.*

This unit of study is aimed at advanced techniques in Remote Sensing (RS), linked with Geographical Information Systems (GIS), as applied to land management problems. The unit consists of three separate but overlapping parts: 1) a short theoretical part which focuses on the concepts of RS; 2) a practical part which aims at developing hands-on skills in using RS and GIS tools, and 3) an application-focused module in which students will learn the skills of how to design a land management project and actualise it using integrated GIS and RS techniques. At the completion of this unit students will have grasp the theories and concepts of GIS and acquired research skills in the application of advanced remote sensing and GIS algorithms to provide evidence-based solutions to natural resource management and environmental problems. Communication skills and critical thinking for solving land resources problems are encouraged through class discussions, group work and tutorial presentations.

#### Textbooks

van Dijk, A. and Bos, M.G. 2001. GIS and remote sensing techniques in land- and water-management. Kluwer Academic Publisher, Dordrecht.

Skidmore, A. 2002. Environmental modelling with GIS and remote sensing. Taylor & Francis, London.

Jesen J. R. 2007. Remote sensing of the environment: an earth resource perspective. 2nd ed. Pearson Prentice Hall Upper Saddle, New Jersey.

### ENVX4002

#### Environmetrics 4

**Credit points:** 6 **Teacher/Coordinator:** Dr Thomas Bishop **Session:** Semester 1 **Classes:** 2x1 hr workshops and 1x3 hr practical (weeks 1-7); 6 hours project work (weeks 8-13) **Prerequisites:** BIOM3004 or BIOM3005 or BIOM3006 or ENVX3002 **Assessment:** One major project (60%), practical assignments (40%)

This unit of study is designed to introduce the students to advanced statistical methods, programming and algorithm development with direct applications for solving environmental and agricultural problems. It is a core unit for BScAgr students wishing to specialize in Environmetrics and available as an elective for students in BScAgr, BHortSc and BLWSc who have completed one of BIOM3004, BIOM3005 or BIOM3006. In the first half the students will learn about spatial and temporal statistics, the design of sampling schemes to monitor change in space and time, and stochastic simulation. These methods will be taught in R to introduce the students to computer programming and algorithm development. In the second half the students will undertake a major project where they will encode a statistical method or simple process model related to their own interests. At the end of this unit, students will have gained an introduction to computer programming and algorithm development which will empower them to create customised code and scripts in their future studies and career. The students will gain research and inquiry skills through the major project where they will develop their own program to perform an analysis of their choice. Information literacy and communication skills will be developed through weekly computer work.

### GENE2001

#### Agricultural Genetics 2

**Credit points:** 6 **Teacher/Coordinator:** Professor Peter Sharp **Session:** Semester 1 **Classes:** (3 lec, 3 prac/problem set)/wk **Prerequisites:** At least one of (BIOL1001, BIOL1002, BIOL1101, BIOL1901, BIOL1911) **Assessment:** Exam, assignment, tests.

This lecture and practical unit of study provides an introduction to the genetics and breeding of plants and animals. It provides an understanding for parallel and following courses. Lectures cover the basics of gene transmission and interaction, cytogenetics, molecular genetics, population and quantitative genetics, as well as the more applied aspects of plant and animal breeding and biotechnology. Practicals emphasise, with agricultural examples, the procedures of genetic and cytogenetic analysis, and the use of computers in simulation procedures in population genetics, quantitative inheritance and selection programs, and provide exposure to current plant and animal breeding and biotechnology.

### GENE4012

#### Plant Breeding

**Credit points:** 6 **Teacher/Coordinator:** Professor Richard Trethowan **Session:** Semester 2 **Classes:** (2 lec, 2 seminars/workshops, 1 lab)/wk **Prerequisites:** BIOM2001, GENE2001 **Assessment:** 2hr exam, assignments, practical reports, presentation.

Lectures and practical work devoted to the theory, philosophy and practice of plant breeding, screening techniques, conservation of genetic variability, breeding for disease resistance, integration of molecular technology in applied plant breeding, with examples from both field and horticultural crops.

### GENE4013

#### Molecular Genetics and Breeding

**Credit points:** 6 **Teacher/Coordinator:** Professor Peter Sharp **Session:** Semester 1 **Classes:** (3 lec, 2 seminars/workshops, 1 lab)/wk **Prerequisites:** BIOM2001, GENE2001 **Assessment:** 2hr exam, assignments, practical reports, presentation.

Lectures and laboratory work covering the structure and function of plant genomes and genes, the technology and results of DNA transformation and the analysis of plant traits by molecular techniques including by genetic mapping using molecular and other genetic markers.

### GENE4014

#### Population and Quantitative Genetics

**Credit points:** 6 **Teacher/Coordinator:** Prof Chris Moran **Session:** Semester 1 **Classes:** (3 lec, 2 labs)/wk **Prerequisites:** BIOM2001, GENE2001 **Corequisites:** GENE4012 **Assessment:** 2hr exam, assignments, practical reports, presentation.

Lectures and practical periods dealing with population genetic, quantitative inheritance and animal breeding given by the Faculty of Veterinary Science.

### GENE4015

#### Cytogenetics

**Credit points:** 6 **Teacher/Coordinator:** Professor Peter Sharp; animal component coordinator, Dr Jaime Gongora **Session:** Semester 2 **Classes:** Equivalent of 2 lecture/tutorials & 3 practicals/week **Prerequisites:** BIOM2001, GENE2001 **Assessment:** essays, assignments, practical reports, oral presentation

This is a final year elective in the two degrees, BScAgr, and BAnVetBiosci.

Lecture and practical work in cytogenetics, especially of plant and animal species of applied interest in plant agriculture, animal agriculture and other applied animal genetics, such as companion, native and endangered species.

The lecture course covers the molecular nature of chromosomes and their transmission, variation in chromosome behaviour, both normal and disease related. In addition, the uses of chromosome engineering to produce variation in plants and animals will also be covered.

The practical component covers the technologies used to study chromosomes or both plants and animals, both mitotic and meiotic chromosomes, and molecular techniques such as in situ hybridisation, gene activity and chromosomal protein localisation.

On completion, students will be able to apply cytogenetic knowledge and technologies to species of eukaryotes of economic significance, and know how cytogenetic processes have affected the development of these species.

## Geography and Geology units of study

For GEOG and GEOS units of study not listed below please refer to the Faculty of Science Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

### GEOG2321

#### Fluvial and Groundwater Geomorphology

**Credit points:** 6 **Teacher/Coordinator:** Dr Melissa Neave **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** GEOG(2311 or 2001) or 36 credit points of Junior study including GEOS(1001 or 1901) or GEOG1001 or ENVI(1001 or 1002) or GEOL1501. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology (or Land and Water Science), Chemistry and Mathematics. Students in the Bachelor of Land and Water Science should have 6 credit points of Junior Geoscience, 12 credit points of Chemistry, 6 credit points of Biology, BIOM1002. **Prohibitions:** GEOG (2002 or 2302 or 2303) or MARS2002 or MARS2006 **Assessment:** One 2 hr exam, one quiz, one field report, practical exercises

This unit of study provides an introduction to the fundamentals of fluvial geomorphology (the study of surface water as an agent of landscape change) and groundwater hydrology. The fluvial geomorphology section of the unit will describe the movement of water in stream channels and investigate the landscape change associated with that movement. Topics to be covered will include open channel flow hydraulics, sediment transport processes and stream channel morphology. Practical work will focus on the collection and analysis of field data. The quantity and quality of the groundwater resources are closely linked to geology and fluvial geomorphology. The groundwater section of this unit is based around four common groundwater issues: contamination, extraction, dryland salinity and groundwater-surface water interaction. In the practical component, common groundwater computer models such as FLOWTUBE and MODFLOW will be used to further explore these problems.

#### Textbooks

Recommended Textbooks: Fetter, CW. Applied Hydrogeology. Prentice-Hall, 2001.

Kington, D. Fluvial Forms and Processes. Hodder-Arnold, 1998.

### GEOS1001

#### Earth, Environment and Society

**Credit points:** 6 **Teacher/Coordinator:** Dr Jody Webster, Dr Bill Pritchard, Ms Edwina Tanner **Session:** Semester 1, Summer Late **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prohibitions:** GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902 **Assessment:** One 2 hour exam, 2000 word essay, field and prac reports

This is the gateway unit of study for Human Geography, Physical Geography and Geology. Its objective is to introduce the big questions relating to the origins and current state of the planet: climate change, environment, landscape formation, and the growth of the human population. During the semester you will be introduced to knowledge, theories and debates about how the world's physical and human systems operate. The first module investigates the system of global environmental change, specifically addressing climate variability and human impacts on the natural environment. The second module presents Earth as an evolving and dynamic planet, investigating how changes take place, the rate at which they occur and how they have the potential to dramatically affect the way we live. Finally, the third module, focuses on human-induced challenges to Earth's future. This part of the unit critically analyses the relationships between people and their environments, with central consideration to debates on population change and resource use.

### GEOS1002

#### Introductory Geography

**Credit points:** 6 **Teacher/Coordinator:** Dr Kurt Iveson **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prohibitions:** GEOS1902, GEOG1001, GEOG1002 **Assessment:** One 2 hour exam, one 2000 word essay, five practical reports

This unit of study provides an introduction to the ways that human and physical landscapes are produced. It begins with an investigation of Earth's surface features, exploring the distribution of landforms across Earth and interpreting their evolutionary histories. Several landscapes will be examined including those formed by rivers, wind, oceans and glaciers. But physical landscapes evolve under the influence of and affect human operations. Therefore, the unit of study will also consider the political, economic, cultural and urban geographies which shape contemporary global society. Each of these themes will be discussed with reference to key examples, in order to consider the ways in which the various processes (both physical and human) interact in the shaping of places. The unit of study will also include short field trips to localities surrounding the university to observe processes of spatial change and conflict. The unit of study is designed to attract and interest students who wish to pursue geography as a major within their undergraduate degree, but also has relevance to students who wish to consider the way geographers understand the contemporary world.

### GEOS1003

#### Introduction to Geology

**Credit points:** 6 **Teacher/Coordinator:** Dr Tom Hubble, Prof Geoff Clarke **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour practical per week. **Prohibitions:** GEOS1903, GEOL1002, GEOL1902, GEOL1501 **Assessment:** One 2 hour exam, practical reports, field report

The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, surface features, sedimentary environments, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of mineral deposits will lead to an understanding of the forces controlling the geology of our planet. Processes such as weathering, erosion and nature of sedimentary environments are related to the origin of the Australian landscape. In addition to laboratory classes there is a two-day excursion to the western Blue Mountains and Lithgow to examine geological objects in their setting.

#### Textbooks

The recommended text is Hamblin & Christiansen. Earth's Dynamic Systems. 9th Edition. Prentice Hall, 2001.

### GEOS2113

#### Making the Australian Landscape

**Credit points:** 6 **Teacher/Coordinator:** Dr S.J. Gale **Session:** Semester 1 **Classes:** Two or three 1-hour lectures and one or two 1-hour practicals per week. **Prerequisites:** 24 credit points of Junior units of study, including GEOS1002 or GEOS1003 or GEOS1902 or GEOS1903 or GEOG1001 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 **Prohibitions:** GEOS2913 **Assessment:** One 2 hour examination, practical reports.

The shifts in the nature of the Earth's environment over time and the resultant changes in process regimes have had dramatic impacts on the way the Australian physical landscape has evolved. We consider here the effects of these changes on the broad pattern of the landscape, focusing particularly on slopes and soils. We follow this by investigating the environmental changes that have taken place since the end of the last glacial, the time when the continent's climates and environments first took on a recognisably modern form. We deal specifically with the impact of human activity on the Australian biophysical environment, emphasising both pre-European impacts and those changes that have taken place since European contact.

### GEOS3018

#### Rivers: Science, Policy and Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Mel Neave **Session:** Semester 1 **Classes:** Two 1 hour lectures, one 1 hour tutorial, two 4 hour practicals per week; fieldwork **Prerequisites:** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geoscience) or ((MARS2005 or



MARS2905) and (MARS2006 or MARS2906)) **Prohibitions:** GEOS3918  
**Assessment:** One 2 hour exam, two 1500 word essays

The unit of study is concerned with understanding the functioning of river catchments from both natural science and social science perspectives, at a variety of scales. The catchment as a morphodynamic process-response system is addressed with an emphasis on the relationships between processes and landform entities. Similarly, relationships within social, economic, and political systems are explored within the catchment context, with particular emphasis on the interactions between the social system and bio-physical system. Empirical context for the unit will primarily be drawn from the Murray-Darling, Mekong, and Hawkesbury-Nepean catchments. Fieldwork in the latter is integral to the unit of study.

#### Textbooks

Gordon, et al. Stream Hydrology: An Introduction for Ecologists. 2004.

## Government units of study

For GOVT units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

### GOVT1101

#### Australian Politics

**Credit points:** 6 **Teacher/Coordinator:** Dr Anika Gauja **Session:** Semester 1 **Classes:** 3 hours per week (may include a combination of lectures and tutorials) **Assessment:** Essay; Exam; Participation; Paper

This unit introduces students to debates about the nature and limits of Australian democracy, to the major institutions of Australian politics, and to the distribution of power in Australian society. Major institutions and forces such as parliament, executive government, the federal system, political parties and the media are examined as arenas of power, conflict and consensus. Who rules? How? Which groups are excluded?

### GOVT1104

#### Power in Society

**Credit points:** 6 **Teacher/Coordinator:** Assoc Prof Rodney Smith **Session:** Semester 2 **Classes:** 2 lectures and 1 tutorial per week **Assessment:** Critical Reading Exercises; Participation; Case Study; Exam

This unit provides an introduction to the study of politics through a focus on the key organising principle of political science: power. Different ways in which power is theorised and structured are considered, not with the intention of presenting a universal theory or theories, but rather to find some connections and extensions amongst a wide variety of experiences of political power. In particular this unit considers the way power operates in Australian society in relation to political decision making. The unit draws on case studies in order to combine the study of key political ideas and concepts with practical examples from our daily lives (e.g. diet, transport, drugs, clothing, etc.).

### GOVT1105

#### Geopolitics

**Credit points:** 6 **Teacher/Coordinator:** Dr John Brookfield **Session:** Semester 1, Semester 2 **Classes:** 3 hours per week (may include a combination of lectures and tutorials) **Assessment:** Critical reading and bibliographic assignments; essay; exam; tutorial participation

This unit will examine how the contemporary international political order has emerged by focusing upon the interplay of diplomatic and strategic issues in the post-war world. It will begin with an analysis of the Cold War and its origins, tracing the development of Soviet-American rivalry, its manifestations in Europe, Asia, Africa and Latin America, and the different ways in which that rivalry was played out. The collapse of the Soviet Union as both a superpower and a state and the disappearance of the communist bloc will be analysed, before surveying the post-Cold War international scene. Among the issues reviewed in the post-Cold War era will be the question of US hegemony and unilateralism vs. multilateralism, nuclear proliferation, the continuing tension between the first and the third worlds, questions

of civilisational conflict, non-state actors and terrorism, democratisation, and regional conflict.

### GOVT1202

#### World Politics

**Credit points:** 6 **Teacher/Coordinator:** Dr Gil Merom (S1); TBA (S2) **Session:** Semester 1, Semester 2 **Classes:** 3 hours per week (may include a combination of lectures and tutorials) **Assessment:** Assignment; Essay; Exam; Participation

This unit introduces the core content of the field of international relations. The first part of the unit presents the realist, liberal, Marxist and constructivist paradigms of international relations. The second part of the unit discusses the key actors and processes political scientists define in the field, including the state, decision makers, bureaucratic organisations, and classes. The final part of the unit focuses on international security, international political economy, and global problems.

### HORT2002

#### Horticultural Science 2

**Credit points:** 6 **Teacher/Coordinator:** Dr Jenny Jobling and Dr Brian Jones **Session:** Semester 2 **Classes:** (2 lec, 1x3hr prac)/wk **Prerequisites:** BIOL1001 and (BIOL1002 or BIOL1902) **Assumed knowledge:** (AFNR1001 and AFNR1002) or (HORT1001 and HORT1002) **Assessment:** One 2 hr exam (55%), 3 assignments and plant ID quiz (45%).

This unit starts with a major excursion to visit successful horticultural enterprises. This excursion will take in a range of enterprises from large-scale organics to high technology monocultures. The excursion will provide you with the opportunity to put what you have learned so far and what you will learn in the rest of the degree program in the context of the cutting edge of horticultural production. After the excursion, the unit of study introduces the physiology of growth and development of fruit trees, the principles of tissue culture and commercial mushroom growing. The students will learn the principles of setting up a scientific plant-based experiment. The students will gain important information about these aspects of the horticultural industry as well as research and enquiry skills through research-based practical sessions and assignments.

#### Textbooks

Reference books: M.N. Westwood. Temperate-Zone Pomology: Physiology and Culture 3rd Edn (Timber Press, 1993)

H.T. Hartmann, D.E. Kester, F.T. Davies & R.L. Geneve. Plant Propagation: Principles and Practices (Prentice Hall International 1997).

### HORT3005

#### Production Horticulture

**Credit points:** 6 **Teacher/Coordinator:** Dr Jenny Jobling **Session:** Semester 1 **Classes:** (2 lec; 1x3hr prac/workshop)/wk **Prerequisites:** Two of PLNT2001, PLNT2901, PLNT2002, PLNT2902, PLNT2003, PLNT2903 **Assumed knowledge:** AFNR1001, AFNR1002 and HORT2002 **Assessment:** One 3 hr exam (55%), three assignments (45%).

This unit of study covers topics on the production of perennial fruit crops, wine grapes, the sustainable production of vegetables and it also covers the key aspects of the postharvest handling and quality assurance of fresh produce. At the end of this unit students are expected to have a detailed understanding of these areas of horticulture and be able to discuss related literature and the physiological principles underlying the commercial success of these horticultural enterprises. Students will also gain research and enquiry skills through research based practical sessions and assignments.

#### Textbooks

Reference Books:

Louis Glowinski (2008) The complete book of fruit growing in Australian. Lothian Books

Westwood, M.N. (1993) Temperate-zone pomology. Timber Press Inc.

Jackson, J.E (2003) Biology of apples and pears. Cambridge University Press

Gopinadhan Paliyath et al. (Ed.) (2008) Postharvest biology and technology of fruits, vegetables, and flowers. Oxford : Wiley-Blackwell

Decoteau, D/. R (2000). Vegetable Crops. Upper Saddle River, NJ: Prentice Hall

## HORT4004

### Issues in Horticultural Science 4A

**Credit points:** 6 **Teacher/Coordinator:** Dr Brian Jones **Session:** Semester 1 **Classes:** 2 lectures per week for 13 weeks & 6 prac per 13 weeks **Prerequisites:** HORT3001 or HORT3004 **Assessment:** Exam (2 hr) (25%), plant ID practical quizzes (15%), consulting report (45%), seminar presentation (15%).

This unit links a range of horticultural science topics with commercial applications. One element is designed around a "supply chain" framework, applied to multiple "real world" case studies. It will develop skills in data analysis and interpretation, problem identification and problem solving. Students will understand how multiple issues must be integrated in order to provide fresh solutions to technical or commercial challenges and opportunities. A second element exposes students to the research work at the Royal Botanic Gardens at Mt Annan. This illustrates the importance of horticultural science to conservation issues. It also covers opportunities and barriers regarding the commercial use of native flora.

## HORT4005

### Research and Practice in Hort Science

**Credit points:** 6 **Teacher/Coordinator:** Dr Brian Jones **Session:** Semester 2 **Classes:** 2h tut/wk; one 1-week excursion **Prerequisites:** HORT3005 **Assessment:** Tutorial papers (20%); project proposal (20%); project report (50%); peer review (10%).

Upon completion of this unit, students will have participated in a major excursion and a series of discussion workshops based on prescribed readings that will broaden their appreciation of current research themes in horticultural science, industry issues, stimulate critical thinking, enhance professional research skills and give an insight into the career opportunities for horticultural scientists. Attendance at seminars, written reports and presentations made during these workshops will improve student skills in critical analysis and communication.

### Information Systems units of study

For INFS units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

## INFS1000

### Digital Business Innovation

**Credit points:** 6 **Session:** Semester 1, Semester 2, Summer Late **Classes:** 3hrs per week **Prohibitions:** ISYS1003, INFO1000, INFO1003 **Assessment:** Class Tests; Problem-based Group project; Final Exam

The Digital Age, with its focus on information as a key business resource, has changed the way Business Information Systems (BIS) are viewed in organisations. They are now seen as enablers of innovation where people supported by powerful technology are considered to be their most important component. This is because creativity, innovation and critical thinking cannot be outsourced or easily acquired by competitors.

This unit is designed to develop your understanding of how businesses operate and shows how information systems support all aspects of business operations and management through integration of people, business processes and systems. You will be provided with an introduction to the state-of-the-art theories, frameworks and models to assist in understanding the nature and contribution of BIS in a range of organisational contexts including private, public and not for profit as well as virtual communities and social networks. With its emphasis on business rather than IT, this unit is suitable for all business and non business majors and does not require prior IT-related experience. If you want to learn how to use technology to become a more innovative and creative business professional and a global technology-savvy citizen this unit is for you!

## LWSC2002

### Sustainable Land and Water Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Dhia Al Bakri (Coordinator), Dr Willem Vervoort **Session:** Semester 2 **Classes:** Lec 2hr/wk; practical: 3hr/wk (for 8 weeks); field work: 25hr/wk (for 1 wk only) **Assumed knowledge:** AFNR1001, AFNR1002 **Assessment:** One 2 hr exam (50%), laboratory and practical reports (20%), field trip report (30%). **Practical field work:** 1 week field trip

This unit introduces students to the principles and practices of sustainable development and integrated catchment management. Students' appreciation of the principles will be facilitated through theoretical and practical case studies focusing on problems and issues facing land and water users and managers in Australia. This unit builds on knowledge gained in AFNR1001, AFNR1002, and SOIL2001 and establishes the foundation for LWSC3005 (Environmental Water Quality) and GEOG2303 (Groundwater Hydrology). The unit provides one of the essential building blocks for developing the conceptual framework for, and linking the other units to the central themes of, the Bachelor of Land and Water Science. The unit consists of two parts. The first part will involve a series of lectures and practical exercises. The second part of the unit is a 5-day field trip traveling from Sydney to Orange and through the Lachlan valley to the Jemalong irrigation district. During the fieldtrip, students will examine the interactions between the socio-economic and biophysical systems of the landscape, undertake data gathering and perform practical exercises in relation to a wide range of land and water issues and problems. After completion of this unit, students should be able to:

Explain the principles underlying the concepts of sustainable development and ICM

Identify main land and water degradation issues in Australia and define relevant causes, effects and management options;

Describe the relevance of the LG model to sustainable catchment and resource management

Develop an understanding of the link between water quantity and water quality and its implications for management.

Employ a range of basic computational techniques which will allow them to explore the link between water quality and quantity in more detail.

Develop an understanding of flow variability, its causes and assessment and its relation to water quality

Assess landscape-land use interaction in relation to farm productivity, water quality and land management.

#### Textbooks

Al Bakri D 2002. Geoscience and sustainable catchment and resource management: The Ben Chifley Catchment case study, *Environmental Geology*, 42, 588-596.

Al Bakri D 2001. Towards developing a geoscientific approach to sustainable agricultural and rural development, *Journal of Environmental Geology*, 40 (4-5), 543-556.

Heathcote IW 1998. Integrated watershed management, principles and practices, John Wiley and Sons, New York.

## LWSC3005

### Environmental Water Quality

**Credit points:** 6 **Teacher/Coordinator:** Dr D Al Bakri, Professor I Kennedy, Dr R Caldwell **Session:** Semester 1 **Classes:** 2 lec/wk; 3hr lab for 7 weeks; 25hr fieldwork (in 1 wk only) **Prerequisites:** LWSC2002 or GEOG2321 or AGCH2003 or 6 credit points of intermediate Chemistry **Assessment:** One 2 hr exam (40%), laboratory and practical reports (35%), field trip professional report (25%).

The unit of study will provide students with an in-depth understanding of the main water quality problems in Australia, related limnological issues and the underlying causes and processes. The unit builds on knowledge gained in LWSC2002, AGCH2003 and GEOG2321. The study program commences with a field trip module to the productive Macquarie and Namoi Valleys, where irrigated agriculture has been developed. Environmental impacts of agricultural enterprises such as irrigation farming and human settlements on water environments will be assessed. Field observations on pH, nutrient level, salt content, pesticide contamination, and microbial content in aquatic environments will be made with samples returned for more detailed laboratory analysis at the University. The unit will also investigate sources and dynamic of pollutants in receiving water, sediment-nutrient interaction and pollution control strategies. The unit will cover aspects of freshwater ecology with particular emphasis on wetlands ecosystem, riparian vegetation, phytoplankton communities and cyanobacteria.

#### Textbooks

Wetzel R G 2001. *Limnology: Lake and reservoir ecosystems*, 3rd edn, Academic Press London.

**LWSC3006****Landscape Hydrology and Management**

**Credit points:** 6 **Teacher/Coordinator:** Dr Willem Vervoort **Session:** Semester 1 **Classes:** (2 lec, 0.6 on-line 2.4 prac )hr/wk **Prerequisites:** LWSC2002 or GEOG2321 **Assumed knowledge:** LWSC3005 **Assessment:** On-line activities 10%; oral presentation 10%; practical reports 50%; 2 hr exam 30%.

This unit of study is designed to allow students to examine catchment-scale hydrological modeling and groundwater hydrogeochemistry as an investigative tool for water quality and policy making at the catchment level.

It is a core unit for students in BLWSc and builds on the theoretical knowledge gained in GEOG2321 and LWSC2002. In the first part, students will learn how to develop their own simulation model of catchment hydrological processes in R and review the possibilities and impossibilities of using simulation models for catchment management. In the second part students will apply hydrogeochemical techniques to investigate groundwater quality and review recent developments in catchment-based management strategies to control salinity and pollution. At the end of this unit, students will be able to build their own catchment model and calibrate this model, articulate advantages and disadvantages of using simulation models for catchment management, justify the choice of a simulation model for a particular catchment management problem, identify issues in relation to uncertainty, apply hydrogeochemical investigation techniques for groundwater and describe innovative strategies for salinity and pollution control. The students will gain research and inquiry skills through research based group projects, information literacy and communication skills through on-line discussion postings, laboratory reports and a presentation and personal and intellectual autonomy through working in groups.

**Mathematics units of study**

For MATH units of study not listed below please refer to the Faculty of Science Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

**MATH1001****Differential Calculus**

**Credit points:** 3 **Session:** Semester 1, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1011, MATH1901, MATH1906, MATH1111 **Assumed knowledge:** HSC Mathematics Extension 1 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1001 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study looks at complex numbers, functions of a single variable, limits and continuity, vector functions and functions of two variables. Differential calculus is extended to functions of two variables. Taylor's theorem as a higher order mean value theorem.

*Textbooks*

As set out in the Junior Mathematics Handbook.

**MATH1002****Linear Algebra**

**Credit points:** 3 **Session:** Semester 1, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1902, MATH1012, MATH1014 **Assumed knowledge:** HSC Mathematics Extension 1 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1002 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study introduces vectors and vector algebra, linear algebra including solutions of linear systems, matrices, determinants, eigenvalues and eigenvectors.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1003****Integral Calculus and Modelling**

**Credit points:** 3 **Session:** Semester 2, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1013, MATH1903, MATH1907 **Assumed knowledge:** HSC Mathematics Extension 2 or MATH1001 or MATH1011 or MATH1111 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1003 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. This unit of study first develops the idea of the definite integral from Riemann sums, leading to the Fundamental Theorem of Calculus. Various techniques of integration are considered, such as integration by parts. The second part is an introduction to the use of first and second order differential equations to model a variety of scientific phenomena.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1005****Statistics**

**Credit points:** 3 **Session:** Semester 2, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1015, MATH1905, STAT1021, STAT1022, ECMT1010 **Assumed knowledge:** HSC Mathematics **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1005 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit offers a comprehensive introduction to data analysis, probability, sampling, and inference including t-tests, confidence intervals and chi-squared goodness of fit tests.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1013****Mathematical Modelling**

**Credit points:** 3 **Session:** Semester 2, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1003, MATH1903, MATH1907 **Assumed knowledge:** HSC Mathematics or MATH1111 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1013 is designed for science students who do not intend to undertake higher year mathematics and statistics.

This unit of study looks at the solution of equations by bisection and iteration, first and second order difference equations where chaos is met, and examples of modelling using simple first and second order differential equations.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1901****Differential Calculus (Advanced)**

**Credit points:** 3 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1111, MATH1011, MATH1001, MATH1906 **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. It parallels the normal unit MATH1001 but goes more deeply into the subject matter and requires more mathematical sophistication.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1902****Linear Algebra (Advanced)**

**Credit points:** 3 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1002, MATH1012, MATH1014 **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. It parallels the normal unit MATH1002 but goes more deeply into the subject matter and requires more mathematical sophistication.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1903****Integral Calculus and Modelling Advanced**

**Credit points:** 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1003, MATH1013, MATH1907 **Assumed knowledge:** HSC Mathematics Extension 2 or Credit or better in MATH1001 or MATH1901 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1903 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study parallels the normal unit MATH1003 but goes more deeply into the subject matter and requires more mathematical sophistication.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MATH1905****Statistics (Advanced)**

**Credit points:** 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1015, MATH1005, STAT1021, STAT1022, ECMT1010 **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. This Advanced level unit of study parallels the normal unit MATH1005 but goes more deeply into the subject matter and requires more mathematical sophistication.

*Textbooks*

As set out in the Junior Mathematics Handbook

**MICR2024****Microbes in the Environment**

**Credit points:** 6 **Teacher/Coordinator:** Dr Andrew Holmes **Session:** Semester 2 **Classes:** (2 lec, 3h prac)/wk **Prerequisites:** 12 credit points of first year Biology **Prohibitions:** MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2021, MICR2921, MICR 2909 **Assessment:** One 2h end of semester exam, project report, practical quizzes.

This unit introduces the diversity of microbes found in soil, water, air, plants and animal environments. Through an examination of their physiology and genetics it explores their interactions with plants, animals and each other, and their roles as decomposers and recyclers in the environment. The soil is a rich microbial environment, and the concept of soil health and its relationship to plant growth is discussed. Practical classes introduce techniques and skills in isolating, quantifying and culturing microbes, designing and interpreting experiments to study microbial growth, and in preparing and presenting data.

*Textbooks*

Wiley et al. 2007. Prescott/Harley/Klein's Microbiology 7th ed. McGraw-Hill.

**MICR3022****Microbial Biotechnology**

**Credit points:** 6 **Teacher/Coordinator:** Dr Nick Coleman **Session:** Semester 2 **Classes:** Two 1-hour lectures per week and seven 4 hour practicals. **Prerequisites:** At least 6 credit points of MBLG units and 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **Prohibitions:** MICR3922, MICR3002, MICR3902 **Assessment:** One 2-hour theory exam, practical reports, lab book and skills assessment.

Microbes are central to biotechnology as chemical factories, as sources of enzymes and as cloning hosts. The lecture and prac courses in MICR3022/3922 aim to teach basic principles and methods in microbiology in the context of applications in biotechnology - including industrial, medical and environmental biotech. A special focus will be on the importance of microbial diversity as a source of enzyme diversity for biotechnology. The course revolves around three themes, summarized as metabolites, enzymes, and communities. Topic areas to be covered in lectures include production of small molecules (alcohols and antibiotics), production of macromolecules (protein expression, recombinant DNA), and management of microbial proteins in plants and animals (principles, methods, risks), and management of microbial communities (gut microbes, wastewater treatment, bioprospecting). Techniques covered in lectures include fermentation, mutation, making and screening clone libraries, directed evolution, heterologous expression, metabolic engineering, environmental metagenomics, microarrays, and high throughput screening. In one practical project students will purify DNA polymerase from recombinant E.coli cells and test the enzyme for its ability to catalyze polymerase chain reaction (PCR). In the second practical project students will isolate hydrocarbon-oxidizing bacteria from soil and assess their ability to produce a useful metabolite (the blue dye indigo).

**Marketing units of study**

For MKTG units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

**MKTG1001****Marketing Principles**

**Credit points:** 6 **Session:** Semester 1, Semester 2 **Classes:** 1 lecture and 1 tutorial per week **Prohibitions:** MKTG2001 **Assessment:** Marketing plan; Group presentation; Tutorial assignment ; Two exams

This unit examines the relationships among marketing organisations and final consumers in terms of production-distribution channels or value chains. It focuses on consumer responses to various marketing decisions (product mixes, price levels, distribution channels, promotions, etc.) made by private and public organisations to create, develop, defend, and sometimes eliminate, product markets. Emphasis is placed on identifying new ways of satisfying the needs and wants, and creating value for consumers. While this unit is heavily based on theory, practical application of the concepts to "real world" situations is also essential. Specific topics of study include: market segmentation strategies; market planning; product decisions; new product development; branding strategies; channels of distribution; promotion and advertising; pricing strategies; and customer database management.

**MKTG1002****Marketing Research 1**

**Credit points:** 6 **Session:** Semester 2 **Classes:** 1 lecture and 1 tutorial per week **Prerequisites:** MKTG1001 (or MKTG2001) **Prohibitions:** MKTG2003 **Assessment:** Group project; Tutorial participation portfolio; Individual critique; Exams (mid-semester and final)

Fundamental to marketing is a requirement to understand who your customers are and what they want. Marketing research is the essential activity of discovering information and presenting it in a useful format to marketing decision makers. This unit introduces the skills and knowledge necessary to allow students to accurately formulate

research questions and then discover answers ensuring that these are accurate, reliable and timely. Particular focus is given to different approaches to and aspects of data collection, including: qualitative research; secondary data collection; questionnaire design; sampling; experimental design; validity and basic data analysis.

### PLNT2001

#### Plant Biochemistry and Molecular Biology

**Credit points:** 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Prof Les Copeland, Dr Rosanne Quinnett **Session:** Semester 1 **Classes:** 2-3 lec/week, 32 hrs total; tutorials: 5 hrs total; laboratories: 36 hrs total **Prerequisites:** 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **Prohibitions:** PLNT2901, AGCH2001 **Assessment:** One 2hr exam, practical reports, practical quizzes, theory of practical exam, 400 word writing assignment.

This unit of study is designed to develop an understanding of the molecular principles that underlie the structure and function of plants and how these principles relate to the use of plants by humans as a source of food and fibre.

The unit is a core unit for BScAgr and BHortSc students and an elective for BSc and other degree programs. It recognizes the specialized nature of plant biochemistry and molecular biology and is a platform for students who wish to gain a sound knowledge of plant growth and development.

This unit covers the biochemistry of the main carbohydrate, lipid, protein and nucleic acid constituents of plants, metabolic pathways that regulate plant growth and development, the mobilization and deposition of storage reserves, storage and expression of genetic information and plant responses to environmental influences. The role of molecular biology in the manipulation of plant growth and development will also be explored.

At the completion of this unit students will be able to demonstrate theoretical knowledge of the biochemical structure and function of plants and how molecular biology can enhance our use of plants as food and fibres. Students will also be able to demonstrate abilities in the practice of laboratory methods used to analyse plants and the effective communication of experimental findings.

Students enrolled in this unit will gain research and enquiry skills through attendance at lectures and participation in laboratory classes and tutorials, information literacy and communication skills through the synthesis of information used to prepare practical reports, social and professional understanding by participation in groupwork and assessments that seek to understand the role of agriculture in the broader community.

#### Textbooks

No recommended text. A study guide/laboratory manual will be available for purchase from the Copy Centre during the first week of semester. Lecture notes and readings will be available through WebCT.

### PLNT2002

#### Aust Flora: Ecology and Conservation

**Credit points:** 6 **Teacher/Coordinator:** Dr Glenda Wardle, Dr Murray Henwood. **Session:** Semester 1 **Classes:** (2 hrs lec & 3 hrs prac)/wk, audiovisual. **Prerequisites:** 6 credit points of a Junior unit of study **Prohibitions:** PLNT2902 **Assessment:** One 2-hr exam (40%), laboratory reports (20%) herbarium (20%), one 2-hr practical exam (20%).

This unit provides a broad understanding of the evolution, classification and diversity of terrestrial plants, and the principles of plant ecology in an Australian context. The major types of Australian vegetation are discussed across a range of temporal and spatial scales, and their current distribution related to their environment and origins. Selected contemporary issues in plant conservation from Australian natural and managed systems are explored. There is a strong emphasis on practical skills such as phylogenetic inference, plant identification and the collection and analysis of ecological data. The practical component of the unit of study uses examples taken from the Australian flora (including plants of horticultural significance) and major crop plants. Important elements of this unit are half-day field trips to the Royal National Park, and the construction of student herbaria. The practical sessions and interactions with staff encourage students to develop their own learning style and enhance a strong sense of self-reliance.

Critical thinking, effective communication and other vocational and generic skills are emphasized. The content is well suited to students with interests in botany, plant science and ecology, and is often combined with units of study offered through the School of Biological Sciences and the Faculty of Agriculture, Food and Natural Resources. This unit of study also complements a wide range of units of study from: science (e.g. plant science, earth and environmental science, animal science, bioinformatics, molecular and cell biology, genetics and biotechnology); agriculture (e.g. horticulture, land and water science, and natural resources); and broader disciplines (e.g. education, arts, and environmental law).

#### Textbooks

A Laboratory Manual for the unit will be available for purchase from the Copy Centre during the first week of Semester.

### PLNT2003

#### Plant Form and Function

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Robyn Overall, Dr Lindsay Campbell **Session:** Semester 2 **Classes:** 24 lectures; 10 tutorials; 8 x 2 hr and 2x3hr labs; 2x6 hr field trips **Prohibitions:** PLNT2903, BIOL2003, BIOL2903, CROP2001 **Assumed knowledge:** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **Assessment:** One 2hr theory exam (40%), prac exam (20%), anatomy project (10%), quizzes (5%), physiology report (10%), field report (15%).

This unit of study investigates the structure of cells, tissues and organs of flowering plants and relates them to function. Topics include; how photosynthesis, translocation, water transport and nutrition relate to the structures that carry out these processes. Most of the information on plant structure will be provided in self-instructional audio-visual sessions augmented by small group discussions. This is integrated with experiments carried out in the laboratory or on field excursions to investigate the physiological aspects of plant structures. There is a focus on recent advances in plant molecular biology where they have been critical in enhancing our understanding of the form and function of plants. The physiological and anatomical responses of plants to extreme environments such as drought and salinity will also be addressed. Attention will be paid to the anatomy and physiology of crop, horticultural and Australian native plants. This unit of study complements Plant Biochemistry and Molecular Biology, Australian Flora: ecology and conservation and Cell Biology and leads onto senior units of study in plant sciences, including Plant Growth and Development. It is essential for those seeking a career in plant molecular biology.

#### Textbooks

Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sunderland, Mass Sinauer  
Recommended reading:  
Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra. (A new edition is currently being written)  
Buchanan BB, Gruissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockville, Maryland  
A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

### PLNT2901

#### Plant Biochem & Molecular Biology (Adv)

**Credit points:** 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Prof Les Copeland, Dr Rosanne Quinnett **Session:** Semester 1 **Classes:** 2-3 lec/week, 32 hrs total; tutorials: 5 hrs total; research project: 36 hrs total **Prerequisites:** A Distinction average in 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **Prohibitions:** PLNT2001, AGCH2001 **Assessment:** One 2hr exam, practical report, 400 word writing assignment.

This unit of study is designed to develop an understanding of the molecular principles that underlie the structure and function of plants and how these principles relate to the use of plants by humans as a source of food and fibre.

This unit is offered at an advanced level and is available to students in BScAgr, BHortSc, BSc and other degree programs. This unit recognizes the specialized nature of plant biochemistry and is of interest to students who wish to gain a more advanced knowledge of plant growth and development.

## 5. Undergraduate units of study

This unit covers the biochemistry of the main carbohydrate, lipid, protein and nucleic acid constituents of plants, metabolic pathways that regulate plant growth and development, the mobilization and deposition of storage reserves, storage and expression of genetic information and plant responses to environmental influences. The role of molecular biology in the manipulation of plant growth and development will also be explored.

At the completion of this unit students will be able to demonstrate theoretical knowledge of the biochemical structure and function of plants and how molecular biology can enhance our use of plants as food and fibres. Students will also be able to demonstrate abilities in the practice of laboratory methods used to analyse plants and the effective communication of experimental findings by completing a short research project.

Students enrolled in this unit will gain research and enquiry skills through attendance at lectures and tutorials and by completing a small research project and information literacy and communication skills through the synthesis of information used to prepare a report on the findings of the research project.

### Textbooks

No recommended text. A study guide/laboratory manual will be available for purchase from the Copy Centre during the first week of semester. Lecture notes and readings will be available through WebCT.

### PLNT2902

#### Aust Flora: Ecology & Conservation (Adv)

**Credit points:** 6 **Teacher/Coordinator:** Dr Glenda Wardle, Dr Murray Henwood  
**Session:** Semester 1 **Classes:** (2 lec & 3 prac)/wk, audiovisual **Prerequisites:** Distinction average in 6 credit points of Junior units of study **Prohibitions:** PLNT2002 **Assumed knowledge:** The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading **Assessment:** One 2-hr exam (40%), laboratory reports (20%) research project (20%), one 2-hr practical exam (20%).

Qualified students will participate in alternative components of PLNT2002. The content and nature of these components may vary from year to year. See prerequisites for Senior units of study in Biology.

### Textbooks

A Laboratory Manual for the unit will be available for purchase from the Copy Centre during the first week of Semester.

### PLNT2903

#### Plant Form and Function (Advanced)

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Robyn Overall, Dr Lindsay Campbell **Session:** Semester 2 **Classes:** 24 lectures; 10 tutorials; 8 x 2 hr and 2x3hr labs; 2x6 hr field trips **Prohibitions:** PLNT2003, BIOL2003, BIOL2903, CROP2001 **Assumed knowledge:** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **Assessment:** One 2hr theory exam (40%), prac exam (20%), research project oral and written presentation (25%), field report (15%).

The content will be based on PLNT2003 but qualified students will participate in alternative components at a more advanced level. The content and nature of these components may vary from year to year.

### Textbooks

Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sunderland, Mass Sinauer

Recommended reading:

Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.

Buchanan BB, Grissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockville, Maryland

A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

### PLNT3001

#### Plant, Cell and Environment

**Credit points:** 6 **Teacher/Coordinator:** Dr Charles Warren and Dr Brian Jones  
**Session:** Semester 2 **Classes:** Workshops and discussions 2 hr/wk; laboratories: alternate weeks 30 hr total (6 pracs; 5 hr each) **Prerequisites:** 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent **Prohibitions:** PLNT3901 **Assessment:** One 2hr exam (30%, 2 reports (30%), two essays (30%) one group presentation (10%).

This unit of study of comprises lectures/workshops and practical sessions that will explore how plants and ecosystems function. Classes will examine the central role of plants in the function of terrestrial

ecosystems (e.g. global and ecosystem cycles of carbon and nutrients). Plants shape how ecosystems function, and at the same time the environment affects how plants function. Hence, we will also examine the mechanisms plants employ to adapt and acclimate to their (often stressful) environment. Adaptation and acclimation of plants to their environment will be examined at molecular through to whole plant scales. You will need to draw on knowledge from intermediate units of study and explore the published literature to successfully integrate information from areas unfamiliar to yourself. The purpose of this Unit of Study is to develop an understanding of current directions in Plant Science at an advanced level. When you have successfully completed this unit of study, you should be able to: be familiar with modern approaches of physiology, biophysics and molecular biology in the study of plant function; understand how domains of knowledge interact to describe plant function; understand how plants function in stressful environments; carryout a small research project; draft a manuscript for publication in a peer-reviewed journal.

### Textbooks

Students will be drawing on the current research literature for content. A Study Guide for the unit will be available for purchase during the first week of semester from the Copy Centre at a cost to be advised.

### PLNT3002

#### Plant Growth and Development

**Credit points:** 6 **Teacher/Coordinator:** Dr Jan Marc (Executive Officer), Prof Robyn Overall, Prof David Guest, Dr Brian Jones **Session:** Semester 2 **Classes:** 2-3 lec per wk, one 4 hr practical (6 weeks only), one 3 hr presentation of research project in week 13 **Prerequisites:** 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent **Prohibitions:** PLNT3902, BIOL3021, BIOL3931 **Assessment:** One 2 hr exam (60%), project presentation and report (20%), laboratory quizzes, report and book (20%).

This unit explores the mechanisms underlying plant growth and development from seed to maturity. It covers the process of building the plant body from embryogenesis, development and operation of meristems, polarity, patterning, controls of flowering and fruit development to programmed cell death and senescence. It includes the role of signals such as plant hormones in coordinating plant growth and development and the molecular and cellular mechanisms underlying plant responses to environmental signals such as gravity and light. There is a focus on recent plant molecular biology that has been critical in enhancing our current understanding of plant growth and development. The unit uses examples from crop, horticultural and native plants as well as the model plant Arabidopsis. Lectures are augmented by experimental work, including and independent research project. The laboratory work will include plant tissue culture, protoplast production and modern cell biological techniques used to study plant development. This unit of study complements other senior units of study in the Plant Science Major and is essential for those seeking a career in plant molecular biology.

### Textbooks

Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sinauer Associates, Sunderland, Massachusetts

Recommended reading:

Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.

Buchanan BB, Grissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockville, Maryland

A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

### PLNT3901

#### Plant, Cell and Environment (Advanced)

**Credit points:** 6 **Teacher/Coordinator:** Dr Charles Warren and Dr Brian Jones  
**Session:** Semester 2 **Classes:** Workshops and discussions 2 hr/wk; laboratories: alternate weeks 30 hr total (6 pracs; 5 hr each) **Prerequisites:** 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent with average grade of distinction **Prohibitions:** PLNT3001 **Assessment:** One 2hr exam (30%, 2 two essays (30%), one advance student project report (30%), one individual oral presentation (10%).

*Note: Department permission required for enrolment.*

This unit of study of comprises lectures/workshops and practical sessions that will explore how plants and ecosystems function. Classes will examine the central role of plants in the function of terrestrial ecosystems (e.g. global and ecosystem cycles of carbon and nutrients). Plants shape how ecosystems function, and at the same time the environment affects how plants function. Hence, we will also examine the mechanisms plants employ to adapt and acclimate to their (often stressful) environment. Adaptation and acclimation of plants to their environment will be examined at molecular through to whole plant scales. You will need to draw on knowledge from intermediate units of study and explore the published literature to successfully integrate information from areas unfamiliar to yourself. The purpose of this Unit of Study is to develop an understanding of current directions in Plant Science at an advanced level. When you have successfully completed this unit of study, you should be able to: be familiar with modern approaches of physiology, biophysics and molecular biology in the study of plant function; understand how domains of knowledge interact to describe plant function; understand how plants function in stressful environments; carryout a small research project; draft a manuscript for publication in a peer-reviewed journal.

#### Textbooks

Students will be drawing on the current research literature for content. A Study Guide for the unit will be available for purchase during the first week of semester from the Copy Centre at a cost to be advised.

### PLNT3902

#### Plant Growth and Development (Advanced)

**Credit points:** 6 **Teacher/Coordinator:** Dr Jan Marc (Executive Officer), Prof Robyn Overall, Prof David Guest, Dr Brian Jones **Session:** Semester 2 **Classes:** 2-3 lec per wk, one 4 hr practical (6 weeks only), one 3 hr presentation of research project in week 13 **Prerequisites:** 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibitions:** PLNT3002, BIOL3021, BIOL3931 **Assessment:** One 2 hr exam (60%), project presentation and report (20%), laboratory quizzes and book (20%).

Qualified students will participate in alternative components of PLNT3002 Plant Growth and Development, representing 30% of the total assessment, as follows: the students will be exempt from one standard laboratory report and the standard independent group project. Instead, the students will conduct an advanced independent individual practical or theoretical research project under the supervision of a member of the academic staff. The program includes a formal presentation of the results of the project in verbal and written reports.

#### Textbooks

Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sinauer Associates, Sunderland, Massachusetts

#### Recommended reading:

Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.

Buchanan BB, Gruissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockville, Maryland

A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

### PLNT3903

#### Systematics and Evolution of Plants Adv

**Credit points:** 6 **Teacher/Coordinator:** Dr Murray Henwood **Session:** Semester 1 **Classes:** 2 lectures & 1 practical per week. **Prerequisites:** Distinction average in 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** PLNT3003, BIOL3015/3915. **Assessment:** One 2 hr take-home exam (45%), oral presentation (5%), nomenclature exercise (15%), research project (35%).

Qualified students will participate in alternative components of PLNT3003 Systematics and Evolution of Plants. The content and nature of these components may vary from year to year.

#### Textbooks

Same as PLNT3003.

### PPAT3003

#### Plant Disease

**Credit points:** 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** (2 lec, 3h prac)/wk **Prerequisites:** MICR2024 **Assessment:** One 2h end of semester exam (60%), one prac exam (25%), six take-home quizzes (15%).

This unit introduces the pathogens and plant diseases that damage natural ecosystems and limit food, fibre and biofuel production. The lecture component of the unit discusses the aetiology of plant disease and symptom development; diagnosis of plant disease; the biology, epidemiology and management of fungi and other microbes that cause plant disease; breeding for disease resistance; plant-parasite relationships; and disease resistance in plants. The practical component builds skills in the techniques used to handle and identify plant pathogens, and develops skills in experimental design, execution and interpretation of experimental data. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments and lecture discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of practical reports), expand from theoretical principles to practical explanations (through observing and reporting on practical work), use appropriate software for analysing data and reporting on laboratory projects. Students learn to work in a research team, plan effective work schedules (to meet deadlines for submission of assessable work), use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through research based group projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

#### Textbooks

Schumann GL & Darcy CJ 2006. Essential Plant Pathology. APS Press, St Paul, Minn., USA.

### PPAT4004

#### Advanced Mycology and Plant Pathology

**Credit points:** 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** 5h/wk **Prerequisites:** PPAT3003 or BIOL3017 **Assessment:** One 2h takehome exam at the end of semester (60%), one 1500-word critical review (30%), lab book (10%).

This unit investigates the evolution, systematics, taxonomy and biology of fungi and their role as plant pathogens; understanding fungal populations and plant disease epidemiology; infection processes and plant defence. The unit builds on the knowledge introduced in PPAT3003 and BIOL3017. Undertaking this unit will develop skills in isolating and identifying plant pathogenic fungi, diagnosing plant diseases, designing, conducting and analysing experiments. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments, projects and tutorial discussions), think critically, and organise knowledge, and expand from theoretical principles to practical explanations. Students will consolidate their teamworking skills, develop self-directed study skills and plan effective work schedules, use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through individual and group research projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

#### Textbooks

Agrios GN. 2005. Plant Pathology 5th ed. Academic Press

Carlile MJ. 2001. The Fungi 2nd ed. Academic Press

Kendrick B. 2001. The Fifth Kingdom 3rd ed. Mycologue Press, Ontario. [www.mycolog.com](http://www.mycolog.com)

### PPAT4005

#### Soil Biology

**Credit points:** 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** 5 h/wk **Prerequisites:** MICR2024 or 6cp intermediate microbiology **Assessment:** Tutorial papers (30%), project proposal and report (50%), peer review (20%).

## 5. Undergraduate units of study

This unit investigates the diversity of organisms living in the soil, their biology, interactions and ecology, and their roles in soil function. The unit builds on the knowledge introduced in MICR2024, PPAT3003 and BIOL3017 and complements soil science studies. Undertaking this unit will develop skills in monitoring soil microbes, designing, conducting and analysing experiments. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments, projects and tutorial discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of project reports), and expand from theoretical principles to practical explanations (through observing and reporting on project work). Students will consolidate their teamworking skills, develop self-directed study skills and plan effective work schedules, use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through group research projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

### Textbooks

Sylvia et al. 2005. Principles and Applications of Soil Microbiology 2nd ed. Pearson.

## Psychology units of study

For PSYC units of study not listed below please refer to the Faculty of Science Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

### PSYC1001

#### Psychology 1001

**Credit points:** 6 **Session:** Semester 1, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week, plus 1 hour per week of additional web-based (self-paced) material related to the tutorial. **Assessment:** One 2.5hr exam, one 1000w essay, multiple tutorial tests, experimental participation.

Psychology 1001 is a general introduction to the main topics and methods of psychology, and is the basis for advanced work as well as being of use to those not proceeding with the subject. Psychology 1001 covers the following areas: science and statistics in psychology; behavioural neuroscience; applied psychology; social psychology; personality theory; human development.

This unit is also offered in the Sydney Summer School. For more information consult the website:

<http://www.usyd.edu.au/summerschool/>

### Textbooks

Psychology 1001 manual.  
Weiten, W. Psychology. Themes and variations. 7th Ed. Belmont, CA: Thomson Wadsworth. 2007

### PSYC1002

#### Psychology 1002

**Credit points:** 6 **Session:** Semester 2, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week, plus 1 hour per week of additional web-based (self-paced) material related to the tutorial. **Assessment:** One 2.5 hour exam, one 1250 word research report, multiple tutorial tests, experimental participation.

Psychology 1002 is a further general introduction to the main topics and methods of psychology, and it is the basis for advanced work as well as being of use to those not proceeding with the subject. Psychology 1002 covers the following areas: human mental abilities; learning, motivation and emotion; visual perception; cognitive processes; abnormal psychology.

This unit is also offered in the Sydney Summer School. For more information consult the web site:

<http://www.usyd.edu.au/summerschool/>

### Textbooks

Psychology 1002 manual  
Weiten, W. Psychology. Themes and variations. 7th Ed. Belmont, CA: Thomson Wadsworth. 2007

### RSEC1031

#### Resource Economics 1

**Credit points:** 6 **Teacher/Coordinator:** Dr Michael Harris **Session:** Semester 2 **Classes:** (2 lec & 1 tut)/wk **Prohibitions:** AGEC1031 **Assessment:** One mid semester exam (1 hour), one final exam (2 hours), tutorial papers, assignments.

This unit provides a comprehensive introduction to resource and environmental economics, and how particular concepts in economics are used to provide insights into efficient and sustainable natural resource management. Some descriptive content regarding Australia's natural resource assets and industries is included, but the primary focus is analytical. Emphasis is placed on the importance of property rights structures, cost-effective regulations and dynamic considerations in managing natural resource stocks and environmental assets. Some material on economic valuation of environmental assets and benefit-cost analysis is included.

### RSEC4131

#### Benefit-Cost Analysis

**Credit points:** 6 **Teacher/Coordinator:** Dr Michael Harris **Session:** Semester 1 **Classes:** (2 lec & 1 tut)/wk **Prerequisites:** (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) **Prohibitions:** AGEC4037 **Assessment:** 20% written essay, 20% mid semester exam, 60% final exam.

This unit provides a detailed treatment of benefit-cost analysis and its use in public sector decision making and project evaluation. The underpinning concepts in welfare economics are analysed in detail, such as economic efficiency, criteria for assessing social welfare improvements, and economic surplus measures. Procedures of undertaking a benefit-cost analysis are presented, and tools of non-market valuation for environmental assets are covered in detail. These techniques include both stated and revealed preference techniques, including contingent valuation, choice modeling, hedonic pricing and travel cost methods.

### RSEC4132

#### Environmental Economics

**Credit points:** 6 **Teacher/Coordinator:** Dr Tihomir Ancev **Session:** Semester 1 **Classes:** (2 lec & 1 tut)/wk **Prerequisites:** ECON2001 or ECOS2001 or AGEC2103 or AGEC2003 **Prohibitions:** ECON3013, AGEC4035 **Assumed knowledge:** (ECON2001 or ECOS2001), (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 **Assessment:** One 1hr midterm exam, practical report, one 2 hr end of semester exam.

The course provides theoretical and empirical background necessary for a resource economist to be able to successfully function when faced with various environmental problems. The unit investigates economic aspects of a range of environmental issues. The studied concepts are exemplified with environmental problems related to agriculture (soil salinity, algal blooms, overgrazing etc.) as well as with environmental problems typical to Australia. The guiding economic themes are: competing uses of the environment / externalities, market failure, the importance of property rights, optimal allocation of pollution abatement, technical issues in non-market valuation methods (measuring benefits without commodities), and the processes for making choices relating to non-market goods. Some social issues with environmental impacts are studied through exploration of the problems of population size and distribution, economic growth, and environmental regulation.

NB: Only available to 4th year students in the FAFNR. Available to 3rd year students in the FEB. Available to students that have completed RSEC1031 or ENVI3013/ GEOS 3513 with permission from the unit coordinator.

### Textbooks

Perman, R., Y. Ma, J. McGilvray and M. Common. Natural Resource and Environmental Economics. Pearson, 3rd Ed. 2003  
Charles D. Kolstad., Environmental Economics., Oxford University Press, 2000  
Tom Tietenberg., Environmental and Natural Resource Economics., 6th Edition, Addison-Wesley, 2003.  
Grafton, Adamowics, Dupont, Nelson, Hill and Renzetti. The Economics of the Environment and Natural Resources. Blackwell Publishing, 2004  
N.B. Students are advised not to buy the textbook before lectures commence in case there are any changes.



**RSEC4133****Economics of Mineral & Energy Industries**

**Credit points:** 6 **Teacher/Coordinator:** Dr Tihomir Ancew **Session:** Semester 2 **Classes:** (2 lec & 1 tut)/wk **Prerequisites:** (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) **Prohibitions:** ECON3013 **Assumed knowledge:** (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 **Assessment:** One 1hr midterm exam, written report on field trip activities, one 2 hr end of semester exam.

The unit provides theoretical and empirical background on the economics of minerals exploration, extraction and marketing and on the economics of energy generation, distribution and use. The economics of minerals and energy commodity markets will be discussed and analysed. The interactions of mineral extraction and energy generation activities with other natural resources and the environment will be of particular interest (e.g. mine site remediation, land use conflicts). Sustainability and prospects for long term efficient use of these resources, as well as the development and use of alternative technologies will also be discussed. In addition, institutional and policy issues (e.g. regulatory reform), will be analysed. The unit will discuss the main aspects of the markets for minerals and energy, market structure, business environment and price movements. The unit will also provide an introductory discussion on the markets for derivatives (options, futures, forward, swaps) on minerals and energy commodities.

NB: Only available to 4th year students in the FAFNR. Available to 3rd year students in the FEB. Available to students that have completed RSEC1031 or ENVI3013/ GEOS 3513 with permission from the unit coordinator

*Textbooks*

Brennan, T.J., Palmer, L.K. and Martinez, A.S., *Alternating Currents: Electricity Markets and Public Policy*, Resources for the Future Press, Washington D.C., 2002.  
 Tilton, J.E., *On Borrowed Time? Assessing the Threat of Mineral Depletion*, Resources for the Future Press, Washington D.C., 2003.  
 Perman, R., Y. Ma, J. McGilvray and M. Common. *Natural Resource and Environmental Economics*. Pearson, 3rd Ed. 2003.  
 Tom Tietenberg, *Environmental and Natural Resource Economics*, 6th Edition, Addison-Wesley, 2003.  
 Ferdinand E. Banks, *Energy Economics: A Modern Introduction*, Kluwer Academic Publishers, 2000.  
 Stephen E. Kesler, *Mineral Resources, Economics and the Environment*, Maxwell Macmillan International, 1994.  
 N.B. Students are advised not to buy the textbook before lectures commence in case there are any changes.

**RSEC4134****Economics of Water & Bio-resources**

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Dr Tihomir Ancew **Session:** Semester 2 **Classes:** (2 lec & 1 tut)/wk **Prerequisites:** (ECON2001 or ECOS2001) and (AGEC2103 or AGEC2003) **Prohibitions:** ECON3013 **Assumed knowledge:** (ECON2002 or ECOS2002), AGEC3001, AGEC2101, AGEC2105 **Assessment:** One 1hr midterm exam, an essay paper, one 2 hr end of semester exam.

*Note: Only available to 4th year students in the FAFNR. Available to 3rd year students in the FEB. Available to students that have completed RSEC1031 or ENVI3013 with permission from the unit coordinator*

The unit consists of two complementary parts: water economics and economics of biological resources (fisheries, forestry, other wildlife). The main objective of the water economic component is to investigate the economic aspects of water use and water quality. In particular approaches toward efficient use of the water resource over time, optimal allocation of water among competing uses and achievement of the socially optimal level of water quality will be discussed. The demand for water from various sectors will be analysed in both static and dynamic settings. Issues considered include the selection and construction of water storages, aquifer water extraction and alternative water sources. The issues of waste water disposal and water quality, changing water technologies, and water pollution will be also discussed. Particular attention will be devoted to the economic mechanisms for managing the water resources including property rights, water allocation and water markets. The key policy instruments (taxes, quotas, standards) in these areas will be analyzed and discussed. The institutional and policy aspects will also be considered through analysis of water policy reform in Australia and elsewhere.

The main objective of the economics of biological resources will be to introduce students to the bio-economic modelling of the resources that experience biological growth. This will be prominently exemplified through various aspects of fishery economics. The unit will also discuss the economics of wildlife preservation and protection, as well as the economics of biodiversity.

Available to 3rd year students in the FEB. Available to students that have completed RSEC1031 or ENVI3113 with permission from the unit coordinator.

*Textbooks*

Bergstrom, Boule and Poe (Eds.), *The Economic Value of Water Quality*, Edward Elgar Pub., 2001.  
 Easter, Rosegrant and Dinar (Eds.), *Markets for Water: Potential and Performance*, Kluwer Academic Pub., 1998.  
 David Smith, *Water in Australia*, Oxford University Press, 1999.  
 Perman, R., Y. Ma, J. McGilvray and M. Common. *Natural Resource and Environmental Economics*. Pearson, 3rd Ed. 2003.  
 John M. Hartwick and Nancy D. Olewiler, *The Economics of Natural Resource Use*, 2nd Ed., Addison-Wesley, 1998.  
 Conrad, J.M. (1999), *Resource Economics*, Cambridge University Press, Cambridge.  
 N.B. Students are advised not to buy the textbook before lectures commence in case there are any changes.

**RSEC4141****Resource Economics Project A**

**Credit points:** 9 **Teacher/Coordinator:** Dr Paulo Santos **Session:** Semester 1 **Classes:** (2 hr sem)/wk **Prerequisites:** AGEC3104 or AGEC3004 or AGEC4041 **Corequisites:** RSEC4142 **Prohibitions:** AGEC4012, AGEC4112 **Assessment:** Research report and presentation.

In this unit of study, students develop skills in economic research by designing, undertaking and reporting on a single research study (thesis). Student undertake research on an approved topic under the supervision of a member of staff and prepare a report of approximately 25,000 words in length.

**RSEC4142****Resource Economics Project B**

**Credit points:** 9 **Teacher/Coordinator:** Dr Paulo Santos **Session:** Semester 2 **Classes:** (2 hr sem)/wk **Prerequisites:** AGEC3104 or AGEC4112 or AGEC4041 **Corequisites:** RSEC4141 **Prohibitions:** AGEC4013, AGEC4113 **Assessment:** Research report and presentation.

This unit of study is taken in conjunction with the companion unit, RSEC4142 Resource Economics Project A. See RSEC4142 for details.

*Textbooks*

Not applicable as this is a research unit.

**SOIL2003****Soil Properties and Processes**

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Balwant Singh (Coordinator), Prof Alex McBratney, Dr Stephen Cattle **Session:** Semester 1 **Classes:** (3 lec & 3hr prac)/wk, and a compulsory field excursion. **Assessment:** Soil description report (10%), Quizzes (or Essay) (15%), Practical exercise book (20%), Practical exam (15%) and Written exam (40%).

This unit of study is designed to introduce students to the fundamental concepts within pedology, soil physics and soil chemistry. These concepts are part of the grounding principles that underpin crop and animal production, nutrient and water cycling, and environmental sustainability taught by other units of study in the Faculty. Students will participate in a two-day field excursion in the first week of semester to examine some common soils of the Sydney Basin, they will also learn to describe soil, and measure soil chemical and physical properties in the field. Referring to common soil profiles of the Sydney Basin, students will concentrate on factors affecting soil formation, the rudiments of soil description, and analysis of soil properties that are used in soil classification. Students will also develop knowledge of the physics of water and gas movement, soil strength, soil chemical properties, inorganic and organic components, nutrient cycles and soil acidity in an agricultural context. At the end of this unit students will become familiar with the factors that determine a soil's composition and behaviour, and will have an understanding of the most important soil physical and chemical properties. Students will develop communication skills through essay, report and practical exercises.

The final report and laboratory exercise questions are designed to develop team work and collaborative efforts.

### Textbooks

Campbell, K.O. & Bowyer, J.W. (eds) (1988). *The Scientific Basis of Modern Agriculture*. Sydney University Press.  
White, R.E. (2006). *Principles and Practice of Soil Science: the Soil as a Natural Resource*. 4th ed., Blackwell Science, Oxford.  
Charman, P.E.V. & Murphy, B.W. (2000). *Soils: Their properties and management*. 2nd ed. Oxford University Press, Melbourne.

## SOIL2004

### The Soil Resource

**Credit points:** 6 **Teacher/Coordinator:** Dr Stephen Cattle (Coordinator), Prof Alex McBratney, A/Prof Balwant Singh **Session:** Semester 2 **Classes:** (2 lec, 2 pracs)/wk, 24 hr (5 days) field work out of semester time **Assessment:** Fieldtrip participation (5%), soil survey mapping report (30%), laboratory report and poster presentation (25%), three group tutorials (20%), viva voce exam (20%)

This unit will familiarize students with the description and mapping of soil types in the Australian landscape, with common analytical methods for soil and with the various forms of degradation that may alter the quality and function of soil. It is an applied soil science unit which builds on the fundamental soil science concepts learned in the SOIL2003 unit. The first practical component of the unit, a five-day soil survey, will give students experience in soil description and classification in the field, and soil samples collected during this survey will be subsequently analysed for a variety of attributes by the students in laboratory practicals. In the lecture series, topics including soil type distribution, soil quality, soil function, soil fertility and soil degradation will be discussed and linked to practical sessions. By the end of this unit, students will be able to construct maps of soil properties and soil type distribution, describe primary soil functions, soil attributes and types of soil degradation in an agricultural context, and be able to recognize and communicate the ability of a soil profile to sustain plant growth. Students will gain research and inquiry skills by collecting, analyzing and interpreting soil survey data, and will gain communication skills by having to prepare and present a poster.

### Textbooks

Brady NC & Weil RR. (2002) *The Nature and Properties of Soils*. 13th ed. (or any later edition) Prentice Hall, New Jersey.  
Isbell RF McDonald WS & Ashton LJ. (1997) *Concepts and Rationale of the Australian Soil Classification*. Australian Collaborative Land Evaluation Program, CSIRO Publishing, Canberra.  
White RE (2006) *Principles and Practice of Soil Science: the Soil as a Natural Resource*. 4th ed., Blackwell Science, Oxford.  
McKenzie N, Jacquier D, Isbell, R & Brown K. (2004) *Australian Soils and Landscapes: An Illustrated Compendium*. CSIRO publishing, Melbourne.

## SOIL3009

### Contemporary Field and Lab Soil Science

**Credit points:** 6 **Teacher/Coordinator:** Prof Alex McBratney (coordinator), A/Prof Balwant Singh, Dr Stephen Cattle, Dr Budiman Minasny **Session:** Semester 1 **Classes:** (2 lec, 2 prac)/wk, 6-day field excursion **Prerequisites:** SOIL2003 **Assessment:** One 2hr exam; pedology, soil physics and soil chemistry written assessments; group presentation, synthesis paper

This is a theoretical and empirical unit providing specialised training in three important areas of contemporary soil science, namely pedology, soil chemistry and soil physics. The key concepts of these sub-disciplines will be outlined and strengthened by hands-on training in essential field and laboratory techniques. All of this is synthesized by placing it in the context of soil distribution and use in North-Western New South Wales. The unit is motivated by the teaching team's research in this locale. It builds on students existing soil science knowledge gained in SOIL2003. After completion of the unit, students should be able to articulate the advantages and disadvantages of current field & laboratory techniques for gathering necessary soil information, and simultaneously recognise key concepts and principles that guide contemporary thought in soil science. Students will be able to synthesise soil information from a multiplicity of sources and have an appreciation of the cutting edge areas of soil research. By investigating the contemporary nature of key concepts, students will develop their skills in research and inquiry. Students will develop their communication skills through report writing and oral presentations and will also articulate an openness to new ways of thinking which

augments intellectual autonomy. Teamwork and collaborative efforts are encouraged in this unit.

### Textbooks

D. Hillel. 2004. *Introduction to Environmental Soil Physics*. Elsevier Science, San Diego, CA, USA  
R. Schaetzl and S. Anderson 2005. *Soils: Genesis and Geomorphology*. Cambridge University Press, New York, NY, USA  
D.L. Sparks 2003 *Environmental Soil Chemistry* (2nd edn). Academic Press, San Diego, CA, USA

## SOIL3010

### The Soil at Work

**Credit points:** 6 **Teacher/Coordinator:** Prof Alex McBratney (coordinator) A/Prof Balwant Singh, Dr Stephen Cattle (facilitators) plus research-only academics **Session:** Semester 2 **Classes:** Problem-based unit: each student completes 2 problems; 4 x 3 hr workshops per problem (each student attends 8 workshops in total) **Prerequisites:** SOIL2003 or SOIL2004 **Assessment:** For each of two scenarios: Statement of the problem report (12.5%) - shared info, but two team reports; How to tackle problem seminar (12.5%) - team seminars, before fieldwork, analyses done; Results seminar (12.5%) - team seminars; Final report (12.5%) - individual work.

This is a problem-based applied soil science unit. It is designed to allow students to identify soil-related problems in the real-world and by working in a group and with an end-user to suggest short and long-term solutions to such problems. This is a core unit for students majoring or specializing in soil science and an elective unit for those wishing to gain an understanding of environmental problem-solving. It utilises and reinforces soil-science knowledge gained in SOIL2003 and/or SOIL2004 and problem-solving skills gained during the degree program. This unit will address real-world scenarios which involve soil-related problems such as carbon management, structural decline, acidification, salinisation and contamination. Students will gain some understanding of the concept of sustainability, and will be able to identify the causes of problems by reference to the literature, discussion with landusers and by the design and execution of key experiments and surveys. They will gain a focused knowledge of the key soil drivers to environmental problems and will have some understanding on the constraints surrounding potential solutions. By designing and administering strategies to tackle real-world soil issues students will develop their research and inquiry skills and enhance their intellectual autonomy. By producing reports and seminars that enables understanding by an end-user students will improve the breadth of their communication skills.

### Textbooks

I.W.Heathcote 1997. *Environmental Problem Solving: A Case Study Approach*. McGraw-Hill, New York, NY, USA.

## VIRO3001

### Virology

**Credit points:** 6 **Teacher/Coordinator:** Dr Tim Newsome **Session:** Semester 1 **Classes:** Two 1-hour lectures per week, five 2-hour tutorials and six 4-hour practicals per semester. **Prerequisites:** At least 6 credit points of MBLG units and at least 6 credit points in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMed units including BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024. **Prohibitions:** VIRO3901 **Assumed knowledge:** MICR (2021 or 2921 or 2022 or 2922) **Assessment:** One 2-hour exam, practical work, group presentations

*Note: Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.*

Viruses are some of the simplest biological machinery known, being completely dependent on hosts for their replication, yet they are also the etiological agents for some of the most important human diseases. New technologies that have revolutionised the discovery of new viruses are also revealing a hitherto unappreciated abundance and diversity in the ecosphere, and a wider role in human health and disease. Developing new gene technologies have enabled the use of viruses as therapeutic agents, in novel vaccine approaches, gene delivery and in the treatment of cancer. This unit of study is designed to introduce students who have a basic understanding of molecular biology to the rapidly evolving field of virology. Viral infection in plant and animal cells and bacteria is covered by an examination of virus structure, genomes, gene expression and replication. Building upon these foundations, this unit progresses to examine host-virus

interactions, pathogenesis, cell injury, the immune response and the prevention and control of infection. The structure and replication of sub-viral agents: viroids and prions, and their role in disease are also covered. The practical component provides hands-on experience in current diagnostic and research techniques such as molecular biology, cell culture, serological techniques, immunofluorescence and immunoblot and is designed to enhance the students' practical skills and complement the lecture series. Tutorials cover a range of topical issues and provide a forum for students to develop their communication skills.

*Textbooks*

Dimmock, Easton and Leppard. Introduction to Modern Virology. 6th edition. Blackwell.

## Industrial Relations and Human Resource Management units of study

For Industrial Relations and Human Resource Management (WORK) units of study not listed below please refer to the Faculty of Economics and Business Handbook at [www.usyd.edu.au/handbooks](http://www.usyd.edu.au/handbooks).

### WORK1003

#### Foundations of Work and Employment

**Credit points:** 6 **Session:** Semester 1, Semester 2 **Classes:** 2 hours of lectures and 1 tutorial hour per week **Assessment:** Participation, short essay, major essay, exam

*Note: This is the compulsory unit of study for the Industrial Relations/Human Resource Management major.*

This unit draws on concepts from industrial relations and human resource management to examine the interests and strategies of workers, unions, managers, employers and the state. It explores the relationships between these parties as they seek to manage their environments and workplaces and to exercise control over each other. The unit enables students to understand how and why the organisation, regulation and management of work are changing in Australia and globally. As well as providing an introduction to all aspects of the study of the employment relationship, this is the foundation unit for a major in industrial relations and human resource management.



## 6. Undergraduate degree resolutions and policies

### Resolutions of the faculty

### Resolutions of the faculty

#### 1. Admission

- 1.1 All applications for admission to candidature to an undergraduate degree or a combined undergraduate degree in the Faculty of Agriculture, Food and Natural Resources will be subject to the Undergraduate Admissions policy of the University of Sydney.

#### 2. Units of study

- 2.1 The units of study, both core and elective, for the Bachelor of Agricultural Economics, Bachelor of Resource Economics, Bachelor of Science in Agriculture, Bachelor of Environmental Systems, Bachelor of Horticultural Science and Bachelor of Land and Water Science are set out in the degree tables in Chapter 4, together with their:

- 2.1.1 credit point values  
2.1.2 assumed knowledge, corequisites and prerequisites  
2.1.3 the semesters in which they are offered  
2.1.4 the units of study with which they are mutually exclusive

- 2.2 A student who enrolls, in accordance with these resolutions, in a unit or units of study prescribed for a degree other than the Bachelor of Agricultural Economics, Bachelor of Resource Economics, Bachelor of Science in Agriculture, Bachelor of Environmental Systems, Bachelor of Horticultural Science and Bachelor of Land and Water Science, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

#### 3. Requirements for the pass degree

- 3.1 To qualify for the degrees of Bachelor of Agricultural Economics, Bachelor of Resource Economics, Bachelor of Science in Agriculture, Bachelor of Horticultural Science and Bachelor of Land and Water Science, candidates must complete units of study making a total of 192 credit points, including Professional Experience and one Faculty excursion. In a full-time program the normal load will be 48 credit points in each year for four years. The degree program must be completed within 10 calendar years of the first enrolment or re-admission without credit. If a candidate is admitted or re-admitted with credit, the faculty will determine a reduced time limit for completion of the degree.

- 3.2 To qualify for the degree of Bachelor of Environmental Systems, candidates must complete units of study making a total of 144 credit points. In a full-time program the normal load will be 48 credit points in each year for three years. The degree program must be completed within 10 calendar years of the first enrolment or re-admission without credit. If a candidate is admitted or re-admitted with credit, the faculty will determine a reduced time limit for completion of the degree.

#### 4. Restrictions on units

- 4.1 A candidate may choose elective units of study for which there is no prerequisite unit of study or for which the prerequisite/corequisite has been satisfied, provided that the timetable permits attendance at all scheduled classes.

- 4.2 Variations permitted to the requirements specified in Resolutions 2 and 3 include:

##### 4.3 *Talented students*

- 4.3.1 Some variation in units of study required for completion of the degree may be approved by the Dean for exceptionally talented students.

##### 4.4 *Summer School*

- 4.4.1 Units of study completed at the University of Sydney Summer School which correspond to units of study listed for the

undergraduate degrees in the faculty handbook may be credited towards the course requirements.

#### 4.5 *Cross-institutional enrolment*

- 4.5.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:

- 4.5.1.1 the unit of study content is material not taught in any corresponding unit of study in the University, or

- 4.5.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

#### 4.6 *Additional units*

- 4.6.1 A student may enrol in units of study additional to the requirements in an academic year, only with the permission of the Dean.

#### 4.7 *Timetable clashes*

- 4.7.1 A student must obtain written permission of the Degree Coordinator concerned, to enrol in units of study which have timetable clashes. Approval may include conditions of attendance.

#### 4.8 *Restriction on enrolment*

- 4.8.1 A student must obtain the written permission of the Associate Dean (Teaching and Learning) to enrol in level 3000 units of study unless he/she has successfully completed all required level 1000 units of study and has successfully completed or is concurrently enrolled in compulsory level 2000 units of study.

#### 4.9 *Credit transfer*

- 4.9.1 Graduates or students in other faculties or other degrees within the faculty or of other institutions who are admitted to candidature for the degree of bachelor in the faculty may be granted credit for units of study required for the various degrees of the faculty as specified in Resolution 2, as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

- 4.9.2 The Dean may approve credit for a maximum of 36 unspecified credit points for units of study successfully completed elsewhere, but not comparable to units listed in Resolution 2, as part of the 96 credit point maximum credit transfer permitted.

### 5. Assessment policy

- 5.1 Assessment methods for units of study offered in the faculty will be included in unit details in the faculty handbook and made available to students enrolled in the units at the beginning of the semester.

#### 5.2 *Examinations*

##### 5.2.1 *Completion of unit of study*

- 5.2.1.1 A student who has been absent from more than 10 percent of classes in a unit may be deemed to have failed to complete the requirements specified by the faculty for the unit and may be excluded by the Dean from admission to examinations in that unit.

##### 5.2.2 *Further testing*

- 5.2.2.1 A Unit Coordinator may require further testing of students in addition to scheduled assessments and examinations, in accordance with Academic Board policy.

- 5.2.2.2 Further tests may be awarded where the candidate has been prevented by sufficient and duly certified illness or misadventure from completing the assessment for a unit of study. The full range of common result grades is available for these candidates.

- 5.2.2.3 Further tests may be awarded in a unit of study where the examiner requires further evidence to reach a final assessment of a candidate who has failed a unit of study and whose performance is borderline (e.g. a final mark in



the range 45–49 percent). The highest grade of award available is Pass.

- 5.2.2.4 Where possible and practicable, all further tests will be administered and results finalised no later than two weeks after the end of the examination period.
- 5.2.2.5 The Unit Coordinator is responsible for the provision of further tests. Students in a unit of study must be given notice of the proposed date for conducting further tests no later than the date of publication of the final University examinations timetable.
- 5.2.2.6 Individual students granted a further test should wherever possible be given at least three days prior notice. A candidate who is absent from a further test without sufficient reason will be deemed to have failed the test.
- 5.2.2.7 In respect to the notification of students referred to above, students will be deemed to have been notified by the Unit Coordinator as a result of the posting of an email to the student/s official University email address.
- 5.2.2.8 It is the responsibility of the student to provide written evidence of illness or misadventure to the Faculty Office as soon as possible and practicable and in any case before the close of the relevant examination period. Where such evidence is not presented in time for the student to be offered a further test on the advertised date, the evidence will only be considered by the Unit Coordinator where there is sufficient reason why it has not been presented by that date.

## 6. Honours and University Medal

- 6.1 For the Bachelor of Agricultural Economics, Bachelor of Resource Economics, Bachelor of Science in Agriculture, Bachelor of Horticultural Science and Bachelor of Land and Water Science, First Class or Second Class Honours, Division One or Division Two may be awarded at graduation.
- 6.2 First Class Honours candidates whose work is of sufficient merit, in the opinion of the Faculty Committee to Award Prizes, Honours and the University Medal, shall receive a bronze medal.
- 6.3 Award of honours at graduation
- 6.3.1 Honours are awarded in Agriculture and not in an individual subject.
- 6.3.2 To be eligible for the award of Honours;
- 6.3.2.1 Students must have achieved a Year 2/3 WAM of at least 65, and
- 6.3.2.2 Students must have completed a piece of independent research as part of the final year of the degree program.
- 6.3.3 The overall aggregate honours mark shall determine the award of honours at the end of the fourth year.
- 6.3.3.1 Other than for level 3000 units of study attempted in Year 4, as provided for in the resolutions, the marks obtained in each of the units of study at level 2000 and level 3000, provided for in the resolutions, shall be weighted according to credit point value and a weighted average mark (WAM) obtained (Year 2/3 WAM).
- 6.3.3.2 The marks obtained in each of the units of study at level 4000 and in any level 3000 units of study attempted in Year 4, as provided for in the resolutions, shall be weighted according to credit point value and a weighted average mark (WAM) obtained (Year 4 WAM).
- 6.3.3.3 The overall aggregate honours mark shall be the average of the Year 2/3 WAM and the Year 4 WAM.
- 6.3.4 In computing a WAM, the mark to be used for a unit of study that a student has attempted more than once shall be the simple average of the marks from all the attempts.
- 6.3.5 For the award of a particular level of honours a candidate, except in special circumstances, must obtain the relevant minimum aggregate honours mark and the minimum Year 2/3 WAM as set out in the following table:

Level of honours	Minimum overall honours mark	Minimum WAM Years 2/3
First Class	75	65
Second Class, Division 1	70	65
Second Class, Division 2	65	65

- 6.3.6 In the event of a recommendation for the award of honours that departs from these standards, it shall be incumbent upon the Degree Coordinator and section concerned to make out a substantial case for such a departure.
- 6.3.7 Admissible grounds for departure would include medical disability or misadventure early in the course, and of a nature for which allowance could not be made through the normal special consideration processes for units of study.
- 6.4 The Committee to Award Prizes, Honours and the University Medal shall be responsible for the award of the university medal and the award of honours. Achievement of the minimum standards referred to elsewhere in these resolutions is not in itself sufficient justification for these awards.
- 6.4.1 A University medal may be awarded, on the recommendation of the relevant Degree Coordinator, to a student who has a Year 4 WAM of at least 85, an overall aggregate honours mark of at least 80 and a Year 2/3 WAM of at least 80.

## 7. Suspension, withdrawal and discontinuation, re-enrolment and satisfactory progress

- 7.1 *Suspension of candidature*
- 7.1.1 A student, who has enrolled for the degree and who wishes to suspend candidature for more than two semesters, must seek approval of the Dean, who, where appropriate, may consult the Associate Dean (Teaching and Learning) and having considered advice, may determine any conditions for re-enrolment.
- 7.1.2 A student, who has not obtained written permission to suspend candidature for more than two semesters, will be required to apply for re-admission in accordance with procedures determined by the Dean.
- 7.2 *Withdrawal and discontinuation of enrolment*
- 7.2.1 *Withdrawal from Semester 1 units of study*
- 7.2.1.1 A candidate for a degree of bachelor who discontinues enrolment in a March Semester unit of study on or before 31 March in that year shall be recorded as having withdrawn from that unit.
- 7.2.2 *Withdrawal from Semester 2 units of study*
- 7.2.2.1 A candidate for a degree of bachelor who discontinues enrolment in a July Semester unit of study on or before 31 August in that year shall be recorded as having withdrawn from that unit.
- 7.2.3 *Discontinuation*
- 7.2.3.1 A student who wishes to discontinue enrolment in a course or a unit of study must apply to the Dean or the Dean's nominee.
- 7.2.3.2 *Discontinued – Not to count as failure:* A candidate for the degree of bachelor who discontinues enrolment in a unit of study after the relevant withdrawal period and up to the last day of the seventh week of teaching in a one semester unit of study, shall be recorded as Discontinued – Not to count as failure (DNF).
- 7.2.3.3 *Discontinued – Fail:* A candidate for the degree of bachelor who discontinues enrolment in a unit of study after the last day of the seventh week of teaching in a one semester unit of study, shall be recorded as Discontinued – Fail (DF).
- 7.2.3.4 The Dean, Pro-Dean or an Associate Dean of the faculty may determine that a discontinuation of enrolment should be recorded as Discontinued – Not to count as failure (DNF) on the grounds of serious ill health or misadventure.
- 7.3 *Re-enrolment after an absence*
- 7.3.1 A student who wishes to re-enrol after an absence must contact the Dean in writing no less than six weeks prior to the commencement of the semester to allow administrative processes to be carried out.

#### 7.4 *Satisfactory progress – exclusion and re-admission*

- 7.4.1 There are certain circumstances in which a student may be asked to show good cause why he/she should be permitted to repeat any previously attempted study, if, in the opinion of the Associate Dean (Teaching and Learning), he/she has not made satisfactory progress towards fulfilling the requirements of the degree or the unit.
- 7.4.2 Satisfactory progress cannot be defined in all cases in advance but a student who has failed more than 50 percent of the credit points for which enrolled in the most recent two semesters of enrolment shall be deemed not to have made satisfactory progress.
- 7.4.3 In cases where the faculty permits the re-enrolment of a student whose progress has been deemed unsatisfactory, the faculty may require the completion of specified units of study in a specified time, and if the student does not comply with these conditions the student may again be called upon to show good cause why he/she should be allowed to re-enrol in the Faculty of Agriculture, Food and Natural Resources.
- 7.4.4.1 It is not possible to define in advance all the reasons that constitute 'good cause' but serious ill health, or misadventure properly attested, will be considered.
- 7.4.4.2 In addition your general record, for example in other courses, would be taken into account. In particular if you were transferring from another faculty your record in your previous faculty would be considered.
- 7.4.4.3 Not usually acceptable as good cause are such matters as demands of employers, pressure of employment, time devoted to non-university activities and so on, except as they may be relevant to any serious ill health or misadventure.

#### 8.0 **Professional Experience**

- 8.1 Students are required to undertake professional experience in university vacations as an integral and essential part of their overall training in the degrees of Bachelor of Agricultural Economics, Bachelor of Horticultural Science, Bachelor of Land and Water Science, Bachelor of Resource Economics and Bachelor of Science in Agriculture. As part of the Professional Experience program, all students must attend one Faculty excursion.
- 8.1.1 All students who enrolled prior to 2005 are required to complete professional experience in order to graduate.
- 8.1.2 All students who enrolled in 2005, 2006 and 2007 are required to complete professional experience as a unit of study in order to graduate.

- 8.1.3 All students who enrolled since 2008 are required to complete professional experience as the AFNR4001 unit of study in order to graduate.
- 8.1.4 Bachelor of Environmental Systems students are not required to complete the professional experience unit of study.

### Resolutions of the Senate - coursework award courses

The resolutions for all coursework degrees, diplomas and certificates must be read in conjunction with the University of Sydney (Coursework) Rule 2000 (as amended), which sets out the requirements for all coursework courses, and with the relevant Faculty Resolutions

1. The undergraduate degrees in the Faculty of Agriculture, Food and Natural Resources shall be:
  - 1.1 Bachelor of Agricultural Economics (BAgrEc)
  - 1.2 Bachelor of Resource Economics (BResEc)
  - 1.3 Bachelor of Science in Agriculture (BScAgr)
  - 1.4 Bachelor of Environmental Systems (BEnvSys)
  - 1.5 Bachelor of Horticultural Science (BHortSc)
  - 1.6 Bachelor of Land and Water Science (BLWSc)
2. **Requirements for the bachelor's degrees of Agricultural Economics, Resource Economics and Science in Agriculture at pass level**
  - 2.1 To qualify for the award of the degree at pass level students must:
    - 2.1.1 complete successfully units of study giving credit for a total of 192 credit points; and
    - 2.1.2 satisfy the requirements of all other By-laws, Rules and Resolutions of the University.
3. **Requirements for the Bachelor of Environmental Systems degree at pass level**
  - 3.1 To qualify for the award of the Bachelor of Environmental Systems a student must:
    - 3.1.1 complete successfully units of study giving credit for a total of 144 credit points; and
    - 3.1.2 satisfy the requirements of all other relevant By-laws, Rules and resolutions of the University.
4. **Requirements for the Bachelor of Agricultural Economics, Bachelor of Resource Economics, and Bachelor of Science in Agriculture at honours level**
  - 4.1 To qualify for the award of the degree at honours level, students must complete the pass level requirements at the honours level published in the Faculty Resolutions relating to the course.





## 7. Undergraduate scholarships and prizes

The information below outlines scholarships and prizes available to undergraduate students. For information about financial assistance go to [www.usyd.edu.au/stuserv/financial\\_assistance\\_office](http://www.usyd.edu.au/stuserv/financial_assistance_office).

Prize or scholarship	Value (\$)	Qualification
Faculty scholarships for HSC entrants	To 8000 pa	See faculty scholarships in this chapter
Rural Sustainability Scholarships	To 10,000 over 2-3yrs	See faculty scholarships in this chapter
James S Ashton Memorial Scholarship	3000	See undergraduate merit scholarships in this chapter
Horticulture Scholarships	5000	See undergraduate merit scholarships in this chapter
EJ Holtsbaum Scholarship	n.a.	See undergraduate merit scholarships in this chapter
Belmore Scholarships	500	Proficiency in first year
	500	Proficiency in first year chemistry
	500	Proficiency in second year
	500	Proficiency in the units Soil Properties and Processes and either Plant Biochemistry and Molecular Biology or Rural Environmental Chemistry
Brian G Davey Memorial Scholarships in Soil Science	400	Proficiency in the units Soil Properties and Processes and the Soil Resource
Golden Jubilee Scholarship in Agri Science	500	Proficiency in third year
Martin McIlrath Scholarships	3000	Proficiency in HSC and first, second and third years (men only). Preference to sons of ex-servicemen
John Mercer Bursary	1000	See details listed before the prize details
John Arthur Cran Prize	100	Proficiency in HSC
Bruce Davidson Prize in Resource Economics	300	Proficiency in an essay or thesis in natural resource economics
Bruce R Davidson Memorial Prize in Resource Economics	200	Proficiency in first year examinations
Clifford Dawson Holliday Prize	200	Proficiency in third year examinations
John Neil Downing Memorial Prize	550	Proficiency in professional experience
Brian S Fisher Prize	1000	Proficiency in agricultural economics by a non-metropolitan student
John and Beatrice Froggatt Prize	1000	Proficiency in second year entomology and the fourth year agricultural entomology specialisation
WW Froggatt Memorial Prize	200	Proficiency in an agricultural entomology project in fourth year
Goodman Fielder Prize in Plant Nutrition	250	Proficiency in the units Crop and Pasture Agronomy and Sustainable Farming Systems
DL Jackson Prize	400	Proficiency in the units The Rural Environment and Climate and the Environment
FC McCleery Memorial Award	200	Fellowship and leadership in the faculty (third year students)

Prize or scholarship	Value (\$)	Qualification
Theresa G Makinson Prize	100	Proficiency in the horticultural science specialisation in fourth year
Warren F Musgrave Prize in Resource Economics	200	Proficiency in second year examinations
Sibella Macarthur Onslow Prize	200	Proficiency in the agronomy specialisation in fourth year
FL Partridge Prize*	400	For students in third and fourth years in need of financial assistance
Alan Randall Prize in Resource Economics	200	Proficiency in third year examinations
Joyce Winifred Rouse Prize	40	Proficiency in the food science specialisation in fourth year
SUAGA Prize	n.a.	President, AGSOC
James M Vincent Prize	1000	Proficiency in agricultural or environmental microbiology
GW Walker Memorial Essay Prize	100	Most proficient essay or report in the unit Agricultural Marketing Analysis
Professor WL Waterhouse Prize	80	Proficiency in the units Agricultural Genetics 2 and Plant Disease
Sir Robert Watt Memorial Prize	80	Proficiency in the unit Crop and Pasture Systems
Weed Society of NSW Prize	100	Proficiency in weed science
NH White Memorial Prize	100	Proficiency in the plant pathology specialisation in fourth year
AR Woodhill Prize in Entomology	300	Proficiency in entomology in second year
Arthur Yates and Co Pty Ltd Prizes (2)	100	Proficiency in the agricultural genetics or horticultural science specialisation in fourth year

\*Applicant required to submit an application to the Scholarships Office.

### Scholarships for first year students

#### Faculty Scholarships

Scholarships valued at up to **\$8000** per year are available for students entering the Bachelor of Agricultural Economics, Bachelor of Resource Economics and Bachelor of Science in Agriculture. The scholarships are valid for the duration of a degree (usually four years).

To be eligible, you need a minimum UAI of 94 and may be asked to attend an interview.

A small number of entry scholarships valued at \$3000 for one year only may be awarded to applicants who just miss out on full faculty scholarships.

If you apply for the University of Sydney Scholarships and nominate the Faculty of Agriculture, Food and Natural Resources, your application will be considered for a faculty scholarship. Applications close on the 30 September and forms are available from your careers adviser or the University of Sydney website at [www.usyd.edu.au/scholarships](http://www.usyd.edu.au/scholarships).



## Rural Sustainability Scholarships

The Rural Sustainability Scholarship program has been established by the Faculty to support students from a rural area that may have considered undertaking a University degree financially unattainable. A scholarship may be taken either as two-year residential scholarship at one of the residential colleges or as a three-year scholarship. Scholarships are available to students from a non-Sydney metropolitan area with a passion for sustainability in natural and agriculture systems, including the areas of carbon, water and food security and who are eligible for Youth Allowance. Applicants must demonstrate that they are eligible for this award and will be required to supply a written statement supporting their passion for sustainability.

**Value: \$10,000 over two or three years.**

Application forms are available via the Faculty website:  
[www.agric.usyd.edu.au/undergraduate\\_study/fees\\_scholarships/](http://www.agric.usyd.edu.au/undergraduate_study/fees_scholarships/)

## University of Sydney scholarships

The University offers scholarships worth up to **\$10,000** each to students completing their HSC (or equivalent). These scholarships have a minimum UAI requirement of 95 and are between one and five years in length. These scholarships are available across all undergraduate degrees within the University.

## Access scholarships

Access scholarships are for students who have suffered some form of educational disadvantage – usually disability, living in a rural/remote area or by being from a low socio-economic background. They are awarded on the basis of equity and merit and valued at **\$5000** per year for up to five years. Applications close in September each year.

## University bursaries

Bursaries are awarded on the combined grounds of financial need and academic merit and application may be made in March to the Financial Assistance Office (open Monday to Friday from 9.30am to 4.30pm; phone: +61 2 9351 2416, email: [fao@stuserv.usyd.edu.au](mailto:fao@stuserv.usyd.edu.au)).

In addition, interest-free loans are available to students who are able to demonstrate financial need.

## Other scholarships

These include the Council of Education Scholarship, the Freemasons' Scholarship and the Spero Gravas Scholarship. Applications close at the end of April. Information is available from the Scholarships website at [www.usyd.edu.au/scholarships](http://www.usyd.edu.au/scholarships).

## Undergraduate merit scholarships

### Scholarships for continuing undergraduate students

Scholarships for one year only are awarded to continuing students (2nd year or higher) on the basis of merit. No application is required.

### James S Ashton Memorial Scholarship

Established in 1995 by donations through the initiative of Professor Fred and Claire Hilmer with the assistance of Susan and James W Ashton in memory of their son James S Ashton (BScAgr 1993), to encourage and assist outstanding undergraduate students in Agriculture. The scholarship may be awarded annually, on the recommendation of the Dean on the advice of a Faculty Selection Committee, to a student who enrolls full-time in the fourth year of the Bachelor of Science in Agriculture or the Bachelor of Animal and Veterinary Bioscience, provided the student's work is of sufficient

merit. The student will show potential for making a significant contribution to the application of science and technology to the animal industries. While the student's overall academic record must be of sufficient merit, it is not intended that the scholarship be limited to the applicant with the strongest academic record. Additional criteria will include performance in project work and work experience in animal science and related areas and participation in community and University activities which would demonstrate evidence of integrity of character, diligence and regard for fellow students. At the time of award, the recipient may not be in receipt of any other substantial scholarship award. Application forms are available at the Faculty of Agriculture, Food and Natural Resources office.

**Value \$3000**

## Horticulture Scholarships

From 2008, the faculty will offer a number of scholarships to Bachelor of Horticultural Science students. The funding for these scholarships has been provided by Australian United Fresh Fruit and Vegetable Association Ltd (AUF), Horticulture Australia Ltd (HAL) and the Lynch Group. Further information about these scholarships, including the terms and conditions, is available from the faculty office.

**Value approximately \$5000pa.**

## The EJ Holtsbaum University of Sydney Faculty of Agriculture, Food and Natural Resources Scholarship

The EJ Holtsbaum Agricultural Research Station was established in 2003 following the gift by Mr EJ Holtsbaum to the University of his property "Nowley". Mr Holtsbaum, whose family had owned Nowley since 1964, made the gift with the view that the farm would continue to prosper under the University's stewardship, and serve as a centre on the Liverpool Plains for the creation and dissemination of innovative technology for agricultural production and natural resource management. Surplus profits from the operation of Nowley are to be allocated for scholarships. Recipients shall be of high academic merit and show the intention to establish a career in agriculture (in whatever form). The intention of the scholarships is to help students fund their studies, and to encourage in recipients a sense of giving something back to the land through their degree, should they have the opportunity to do so.

## More undergraduate scholarships

### Belmore Scholarships

In 1871, the Earl of Belmore made a gift for the purpose of providing a gold medal for proficiency in geology and practical chemistry with special reference to agriculture. His Lordship stated that should additional branches connected with agriculture be thereafter taught in the University, the examination for the medal might be made to embrace them. Upon the establishment of a Chair of Agriculture in 1910, it was decided to award the income of the fund as a scholarship. Four scholarships of **\$500** each are awarded annually on the recommendation of the Dean of the faculty to students in the faculty. Two are tenable by students enrolling in the second year of the Bachelor of Horticulture Science, Bachelor of Land and Water Science, Bachelor of Resource Economics or Bachelor of Science in Agriculture degree, the first being awarded to the student showing greatest proficiency in the first-year examinations and the second awarded for greatest proficiency in the first-year Chemistry units of study. A further two are tenable by students enrolling in the third year of the Bachelor of Horticulture Science, Bachelor of Land and Water Science, or Bachelor of Science in Agriculture degree, the first being awarded to the student showing greatest proficiency at the second year examinations and the second awarded for greatest proficiency in Soil Properties and Processes and either Plant Biochemistry and Molecular

Biology or Rural Environmental Chemistry. A student enrolling in the third year of the Bachelor of Resource Economics degree is also eligible for the second-year general proficiency scholarship. In each case the student's work must be of sufficient merit. Two scholarships may not be awarded to the same person in any one year.

### Brian G Davey Memorial Scholarships in Soil Science

Established in 1989 at the request of Mrs Leith Davey in memory of her husband Dr Brian G Davey, Senior Lecturer in Soil Science until his death in 1989. Two scholarships may be awarded annually on the recommendation of the Sciences Discipline Leader. One may be awarded to the most proficient student who achieves the highest aggregate mark in the units of study Soil Properties and Processes and the Soil Resource in the Faculty of Agriculture, Food and Natural Resources and who enrolls in the fourth year Soil Science specialisation for a Bachelor of Science in Agriculture or a Bachelor of Land and Water Science degree, provided the student's work is of sufficient merit. The other scholarship may be awarded to the most proficient student who achieves the highest aggregate mark in the units of study Soil Properties and Processes and the Soil Resource in the Faculty of Science who enrolls in Soil Science honours for a Bachelor of Science degree, provided the student's work is of sufficient merit. The scholarships may be shared. If sufficient funds are available more than two scholarships may be awarded in any one year.

**Value: \$400 per annum each**

### Golden Jubilee Scholarship in Agricultural Science

In 1960, which was the golden jubilee year of the foundation of the School of Agriculture in this University and of the Australian Institute of Agricultural Science, a committee was formed to raise a fund to endow an annual scholarship in agricultural science. The scholarship was established in 1961 by the gift of £1574 18s 0d from the Jubilee Scholarship Fund Appeal. Awarded annually for the study of agricultural science in the fourth year to a student at the end of third year, on the basis of academic achievement, application to the course of study and aptitude for agricultural science.

**Value: \$500**

### Martin McIlrath Scholarships for Undergraduates in Veterinary Science and Agriculture

The scholarships tenable in the first year are awarded on the results of the HSC examination and those in higher years on the results of the annual examinations of the preceding years. In the award of the scholarships preference is given to ex-servicemen and male descendants of ex-servicemen. Women are eligible to apply if they are current or ex-members of the armed forces. Each scholarship is tenable for one year. The scholarships are awarded by the Trustees on the recommendation of the faculty concerned and after consideration of the question of preferred eligibility. Please note that these scholarships will only be awarded in any one year when there are eligible applicants in both the faculties of Agriculture, Food and Natural Resources and Veterinary Science.

**Value: Approximately \$3000, tenable for 1 year**

The application form is available from:

[www.usyd.edu.au/study/scholarships](http://www.usyd.edu.au/study/scholarships).

### John Mercer Bursary (Agriculture)

This bursary has been created by donation of the family, friends, colleagues and students of the late John R Mercer, Senior Lecturer in Animal Nutrition at the University. The bursary is available to one or more students enrolled in animal science units of study in third or fourth years of the Bachelor of Science in Agriculture or the Bachelor of Animal and Veterinary Bioscience who have demonstrated sufficient academic merit and are in financial need. Preference may be given to students with a demonstrable interest in Animal Nutrition. The award

will be made on the recommendation of the Dean of the Faculty of Veterinary Science.

**Value \$1000 annually.**

For further information see:

[www.usyd.edu.au/current\\_students/student\\_services/finances/scholarships](http://www.usyd.edu.au/current_students/student_services/finances/scholarships)

### NSW Farmers Association Tertiary Scholarships

You may apply directly to the Association for one of five competitive scholarships available across NSW. To be eligible for a scholarship, you, your partner or your parents must have been full members of the Association for at least the two consecutive years before the date on which you apply. Applicants must be full-time students, in the second or subsequent year of full-time study.

Applicants will be assessed on the basis of:

- academic record and status
- all round ability including leadership qualities
- communication skills and practical application, and
- commitment to agriculture and rural communities.

Applications close in January each year and forms are available from: [www.nswfarmers.org.au](http://www.nswfarmers.org.au).

**Value: \$5000**

## Undergraduate prizes

### John Arthur Cran Prize

Established in 1959 by the offer of an annual donation by Mrs Esther Cran in memory of her husband John Arthur Cran. In 1983 the University received a bequest of \$1000 from Mrs Cran with the intent that the prize be awarded in perpetuity. The prize may be awarded annually on the recommendation of the Dean of the Faculty of Agriculture, Food and Natural Resources to the most proficient candidate at the Higher School Certificate or equivalent examination who enrolls full-time in the first year of candidature for one of the following degrees – Bachelor of Science in Agriculture, Bachelor of Agricultural Economics, Bachelor of Environmental Systems, or Bachelor of Resource Economics – provided that the student's work is of sufficient merit.

**Value: \$100**

### Bruce Davidson Prize in Resource Economics

Established in 1995 by donations from the family of Bruce Robinson Davidson and former students and colleagues in recognition of his pioneering research in water resource economics in Australia, and as a tribute to his outstanding contributions as a teacher and researcher in agriculture and agricultural economics. Awarded annually, on the recommendation of the Agricultural and Resource Economics research group leader, to an undergraduate student enrolled in the Faculty of Agriculture, Food and Natural Resources who submits the best essay or thesis in the area of natural resource economics.

**Value: \$300**

### Bruce R Davidson Memorial Prize in Resource Economics

Established in 2002 by a donation from Dr David Godden in recognition of Dr Davidson, a former member of this faculty, for his extensive research in resource economics in Australia. Awarded annually, on the recommendation of the Agricultural and Resource Economics research group leader, to the Bachelor of Resource Economics student showing the greatest proficiency at the first year examinations.

**Value: \$200**

### Clifford Dawson Holliday Prize

Founded in 1954 by a bequest of £1000 from Andrew Holliday for a prize to be known as the Clifford Dawson Holliday Prize in Agriculture. Awarded annually to the most proficient candidate at the third year annual examinations in the Faculty of Agriculture, Food and Natural Resources.

**Value: \$200**

### John Neil Downing Memorial Prize

Established by RG Downing BSc(Agr), by gifts of £25 in 1948 and £500 in 1949, for a prize in memory of his son, Lieutenant John Neil Downing, who was killed in action. The prize, which may be shared, is awarded annually on the recommendation of the Dean of the Faculty of Agriculture, Food and Natural Resources to the student in the Faculty of Agriculture, Food and Natural Resources who shows greatest proficiency in the professional experience requirement, provided the student's work is of sufficient merit.

**Value: \$550**

### Brian S Fisher Prize

Established in 2009, by a donation from former Dean of the Faculty, Dr Brian S. Fisher. Two prizes to be awarded annually for excellent performance or proficiency by a non-metropolitan student in the first year of the Bachelor of Agricultural Economics.

**Value: \$1000**

### John and Beatrice Froggatt Prize

Established in 1986 by a bequest of \$10,000 from the estate of Mrs Beatrice E Froggatt of Killara who died in 1985. Awarded annually on the recommendation of the Crop and Food Systems research group leader to the student with the highest aggregate in the second year unit of study Entomology and fourth year Entomology specialisation, provided that the student's work is of sufficient merit. The prize may be shared.

**Value: \$1000**

### WW Froggatt Memorial Prize

Established in 1979 by a bequest of \$1000 from the estate of Joyce Chiosso Froggatt in memory of her father. Awarded annually on the recommendation of the Crop and Food Systems research group leader to the student in fourth year Agricultural Entomology who shows the greatest proficiency in a research project in entomology, if the student's work is of sufficient merit.

**Value: \$200**

### DL Jackson Memorial Prize

Established in 1975 by public subscription in memory of DL Jackson, Senior Lecturer in the Department of Agronomy and Horticultural Science. To be awarded annually on the recommendation of the Crop and Food Systems research group leader after consulting the professor most concerned to the most proficient student in the units of study the Rural Environment and Climate and the Environment provided that the candidate's work is of sufficient merit.

**Value: \$400**

### FC McCleery Memorial Award

Established in 1979 by a series of donations over a number of years by the Reverend AB Catley, a graduate of the Faculty of Agriculture, for an award in that faculty. The award honours the memory of FC McCleery, BScAgr (1925), the former Chief Biometrician in the NSW Department of Agriculture. FC McCleery was judged by his peers, both when a student at this University and in his later professional career, to be a man of great integrity who contributed greatly in both fields by his leadership and fellowship. Throughout his professional

career he remained interested in a wide range of subjects from classical Greek literature to modern theology.

The award is made annually after a ballot, conducted by the Dean, of third year students in the Faculty of Agriculture, Food and Natural Resources to the person amongst their number who they judge at that ballot to have contributed most to the life of the Faculty by way of leadership and fellowship. Only those students who have completed the first two years of their degree course in minimum time shall be eligible for nomination.

**Value: \$200**

### Theresa G Makinson Prize

Established in 1972 by the donation of \$500 from Miss KJ Laurence, to establish a prize in memory of her aunt, Theresa Genevieve Makinson, 1885–1939. Awarded annually, on the recommendation of the Crop and Food Systems research group leader after consulting the professor most concerned, to the most proficient student in fourth year specialisation Horticulture, provided that the candidate's work is of sufficient merit.

**Value: \$100**

### Warren F Musgrave Prize in Resource Economics

Established in 2002 by a donation from Dr David Godden in recognition of Professor Musgrave, a former student of this faculty, for his extensive research in resource economics in Australia. Awarded annually, on the recommendation of the Agricultural and Resource Economics research group leader, to the Bachelor of Resource Economics student showing the greatest proficiency at the second year examinations.

**Value: \$200**

### Sibella Macarthur Onslow Memorial Prize

Established in 1944 by a gift of £360 from members of the Victorian League of New South Wales and other friends of Miss Sibella Macarthur Onslow. Awarded annually on the recommendation of the Crop and Food Systems research group leader, after consulting academic staff most concerned, for greatest proficiency in the fourth year specialisation Agronomy, provided the student's work is of sufficient merit.

**Value: \$200**

### FL Partridge Prize

Founded in 1928 by a gift of shares from an anonymous donor to establish the "FL Partridge Endowment" in memory of FL Partridge. The endowment is used to provide a prize in the Faculty of Agriculture, Food and Natural Resources in accordance with the following conditions:

- The FL Partridge Prize shall be awarded to undergraduates in the Faculty of Agriculture, Food and Natural Resources who have passed the second year examination in that faculty.
- The prize shall be of the annual value of **\$400** and shall be tenable in the third and fourth years of the agricultural curriculum, provided the holder is diligent and of good conduct and passes creditably all the examinations of the course.
- The prize will only be awarded to students in such necessitous circumstances that they would have difficulty in completing the agricultural curriculum without some financial assistance.
- Where there are two or more candidates who fulfill the last condition, the prize will be awarded to the student who at the end of the second or third year has the best academic record.
- Any unexpended income shall be used to create a fund for the carrying out of such research work within the faculty as the faculty may determine.
- Applications for the FL Partridge Prize must reach the Registrar before the end of March in each year.

### Alan Randall Prize in Resource Economics

Established in 2002 by a donation from Dr David Godden in recognition of Professor Randall, a former student of this Faculty, for his research in international resource economics. Awarded annually, on the recommendation of the Agricultural and Resource Economics research group leader, to the Bachelor of Resource Economics student showing the greatest proficiency at the third year examinations.

**Value: \$200**

### Joyce Winifred Rouse Prize

The prize was established in 1987 by a donation from Randolph G Rouse on behalf of his wife. Awarded annually on the recommendation of the Crop and Food Systems research group leader to the most proficient student in fourth year specialisation Food Science in the Bachelor of Science in Agriculture degree or the Bachelor of Science degree provided that the candidate's work is of sufficient merit.

**Value: \$40**

### Sydney University Agricultural Graduates' Association Prize

Established in 1994 by an offer of an annual donation from the Sydney University Agricultural Graduates' Association to recognise undergraduates who contribute time and effort to the leadership and fellowship of agricultural students. The prize shall be awarded annually to the student elected as President of the Sydney University Agricultural Society.

**The prize shall be a commemorative object selected by SUAGA.**

### James M Vincent Prize in Agricultural or Environmental Microbiology

Established in 2008 by Professor Paul Vincent and his wife Kerry to commemorate the memory of his father who was a distinguished researcher in agricultural microbiology. Awarded annually at the discretion of the Dean of the Faculty of Agriculture, Food and Natural Resources for the best undergraduate performance in the area of Agricultural or Environmental Microbiology in a unit of study or in a fourth year research thesis.

**Value: \$1000**

### GW Walker Memorial Essay Prize

Founded in 1944 and 1945 by amounts of £50 each received from the New South Wales Council of Agriculture Associations, Lindley Walker Wheat Coy Ltd, and the Flour Mill-Owners' Association of New South Wales, as a memorial to George W Walker. Awarded annually on the recommendation of the Agricultural and Resource Economics research group leader to the student who presents the best essay in the unit of study Agricultural Marketing Analysis, provided the essay is of sufficient merit.

**Value: \$100**

### Professor WL Waterhouse Prize

In 1953 a sum of £150 was handed to the Senate by the Sydney University Agricultural Graduates' Association as part of subscriptions received in making a presentation to Professor WL Waterhouse on his retirement. The money was used to establish a prize to perpetuate the name and work of Professor Waterhouse. Awarded annually to the most proficient student in the units of study Agricultural Genetics 2 and Plant Disease, provided that the candidate's work is of sufficient merit.

**Value: \$80**

### Sir Robert Watt Memorial Prize

Established in 1966 by the gift of \$500 from Lady Madge Watt and her daughter in memory of Emeritus Professor Sir Robert Watt, the first Professor of Agriculture at this University. Awarded annually on the recommendation of the Crop and Food Systems research group leader, after consulting the professor most concerned, to the most proficient student in Crop and Pasture Systems, provided the candidate's work is of sufficient merit.

**Value: \$80**

### Weed Society of New South Wales Prize

Founded in 1971 by the offer of an annual gift from the Weed Society of New South Wales. Awarded annually on the recommendation of the Crop and Food Systems research group leader to the undergraduate student who presents the best essay in the area of Weed Science, provided that the candidate's work is of sufficient merit.

**Value: \$100**

### NH White Memorial Prize

Established in 1995 by donations from the former students and colleagues of Neville Hewlett White as a tribute to his outstanding contributions as a teacher and researcher in Plant Pathology. Awarded annually on the recommendation of the Crop and Food Systems research group leader to the most proficient student in the specialisation of Plant Pathology within the fourth year of the BScAgr program.

**Value: \$100**

### AR Woodhill Prize in Entomology

Established in 1966 by the gift of \$1000 from Mrs Woodhill and the colleagues and students of Dr AR Woodhill. Awarded annually on the recommendation of the Crop and Food Systems research group leader to the most proficient student in the second year unit of study Entomology, provided that the candidate's work is of sufficient merit. The prize may be shared.

**Value: \$300**

### Arthur Yates and Co Pty Ltd Prize

Established in 1977. Two prizes of \$100 each are awarded annually, the first on the recommendation of the Sciences discipline leader after consulting academic staff most concerned to the most proficient student in the specialisation of Horticulture in fourth year, provided that the candidate's work is of sufficient merit, and the second on the recommendation of the Director of the Plant Breeding Institute after consulting academic staff most concerned to the most proficient student in the specialisation of Agricultural Genetics in fourth year, provided that the candidate's work is of sufficient merit.

### Prize compositions

These are prizes for best essays in a variety of fields. Entries usually open around April and close at the end of August. See the Scholarships website ([www.usyd.edu.au/scholarships](http://www.usyd.edu.au/scholarships)) for more information.

### Ineligibility

A candidate who presents for re-examination in any unit of study shall not normally be eligible for any prize or scholarship awarded in connection with such examination.

## Regulations for undergraduate scholarships in Agriculture, Food and Natural Resources

Established in 1991, by funding from companies, organisations and individuals, referred to hereafter as 'cooperating companies', to encourage and assist candidates for the degrees of Bachelor of Agricultural Economics, Bachelor of Horticultural Science, Bachelor of Land and Water Science, Bachelor of Resource Economics or Bachelor of Science in Agriculture.

1. The scholarship shall be awarded under the following conditions:

- 1.1 Each scholarship shall be named an Undergraduate Scholarship in Agriculture, Food and Natural Resources, except where a cooperating company requests that its name be used as an identifier within the scheme.
- 1.2 The scholarships shall be open to citizens and permanent residents of Australia who qualify in the final year of secondary schooling to enter the Faculty of Agriculture, Food and Natural Resources at the University of Sydney.

2. Tenure

- 2.1 Each scholarship shall be tenable for the specific agricultural degree for which it is offered, where applicable, and shall not be transferable to another degree except in exceptional circumstances.
- 2.2 The scholarships shall be tenable for the duration of each recipient's degree program, provided that the scholar meets all the obligations of the program and maintains satisfactory academic progress.

3. Advisory Committee

3.1 There shall be an Advisory Committee consisting of the following persons:

- 3.1.1 no fewer than five representatives of separate cooperating companies;
- 3.1.2 no fewer than two heads of disciplines in the Faculty including the Agricultural and Resource Economics Discipline Leader (or nominees);
- 3.1.3 no more than three members of the Institute of Advanced Studies within the Faculty;
- 3.1.4 the Dean of the Faculty; and
- 3.1.5 the Executive Director of the Undergraduate Scholarships in Agriculture, Food and Natural Resources Program.

3.2 The Advisory Committee shall elect its own chairperson.

3.3 The Advisory Committee shall advise the Faculty on the conduct and management of the program, including scholar selection, the nature and organisation of the professional experience component, and such other matters as it considers pertinent to the effective operation of the program.

3.4 The Executive Director of the program shall be a member of the Faculty, nominated by the Dean, appointed by the Advisory Committee.

3.5 The Executive Officer of the program shall be a member of the University's administrative staff, nominated by the Dean, and shall attend meetings of the Advisory Committee.

4. Annual meeting of cooperating companies

4.1 There shall be an annual general meeting of cooperating companies during the first semester of each academic year, when:

- 4.1.1 the Advisory Committee shall report on the operation of the program over the previous year;
- 4.1.2 the membership of the Advisory Committee for the coming year shall be determined; and
- 4.1.3 any matters relating to the program may be raised and decisions thereon made for implementation by the Advisory Committee.

5. Awarding of the scholarships

5.1 The scholarships shall be awarded on the basis of academic merit (as indicated by the applicants' performance at the NSW Higher School Certificate Examination, or equivalent), leadership potential and personal qualities.

5.2 The scholarships shall be awarded on the recommendation of selection panels consisting of at least one representative from cooperating companies and at least one member of the Faculty appointed by the Dean.

6. There shall be no bonding or other commitment to employment between a cooperating company and any scholar.

7. A scholarship is intended for a continuous four-year degree program, but the Advisory Committee may consider a request for an interruption in a scholar's progress towards the bachelor degree for some exceptional purpose, and, if such request is approved, the scholarship shall be suspended during such interruption.

8. Cost

8.1 Cooperating companies shall make a donation to The University of Sydney Undergraduate Scholarship in Agriculture Program, for each year and for each scholarship place supported, comprising the annual scholarship stipend together with an administration levy of \$600 + GST.

8.2 Transfers of funds from cooperating companies to the University shall be made by 31 January in the year to which the scholarship place applies.

8.3 The administrative levy will be reviewed each year.

9. Benefits to cooperating companies

9.1 Each current cooperating company shall be entitled to:

- 9.1.1 access to the whole pool of Undergraduate Scholars in Agriculture, Food and Natural Resources for professional work experience in the cohort or cohorts contemporaneous with the year or years of its support; and
- 9.1.2 inclusion of the company's name on a roll of cooperating companies to be set up in the Faculty Office.

10. Value and payments

10.1 The value of the scholarship stipend in 2008 was \$7000 per annum.

10.2 The value of the scholarship stipend shall be adjusted annually by the Advisory Committee after considering movements in the consumer price index.

10.3 A scholarship shall run from 1 March to the following 30 November.

10.4 The scholarship payments shall be made at regular intervals.

## 8. Postgraduate course requirements

The higher degrees and qualifications in the faculty are:

- Doctor of Agricultural Economics (DAgrEc)
- Doctor of Science in Agriculture (DScAgr)
- Doctor of Philosophy (PhD)
- Master of Agricultural Economics (MAgrEc)
- Master of Science in Agriculture (MScAgr)
- Master of Agriculture (MAgr)
- Graduate Diploma in Agriculture (GradDipAgr)
- Graduate Certificate in Agriculture (GradCertAgr)

The regulations governing the award of these degrees are printed in this handbook. Prospective candidates should consult with the Associate Dean, Postgraduate Studies concerned before submitting an application for admission to candidature.

All candidates would normally begin in Semester 1 (near the end of February). In some cases candidates may be able to commence in Semester 2 (late July). Teaching in postgraduate courses in the faculty develops skills and graduate attributes. A Statement of Generic Graduate Attributes can be found in this handbook at Section 7 (Other faculty information). The following statements summarise part only of the regulations governing the award of these degrees.

### Doctor of Agricultural Economics and Doctor of Science in Agriculture

The degrees of Doctor of Agricultural Economics and Doctor of Science in Agriculture shall not be conferred until the candidate is a graduate of eight years' standing from the degree which qualified him or her for candidature. The degree may be awarded for published work which, in the opinion of the examiners, has been generally recognised by scholars in the field concerned as a distinguished contribution to knowledge.

### Doctor of Philosophy

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required (mainly in the form of seminars) but in no case is it a major component.

Applicants should normally hold a master's degree with research or a bachelor's degree with first or high second class honours of the University of Sydney, or an equivalent qualification from another university or institution.

The degree may be taken on either a full-time or part-time basis. In the case of full-time candidates, the minimum period of candidature is four semesters for candidates holding a master's degree or equivalent, or six semesters in the case of candidates holding a bachelor's degree with first class or second class honours; the maximum period of candidature is normally eight semesters. The first full year of candidature is normally on probation.

Part-time candidature may be approved for applicants who can demonstrate that they are engaged in an occupation or other activity which leaves them substantially free to pursue their candidature for the degree. They should be able to devote at least 20 hours per week to candidature or an equivalent annual period made up in blocks. Normally the minimum period of candidature will be determined on the recommendation of the faculty but usually will not be less than the equivalent of 6 semesters.

### Master of Agricultural Economics and Master of Science in Agriculture

Graduates of the University of Sydney who have completed units of study acceptable to the Faculty of Agriculture, Food and Natural Resources or persons who, in the opinion of the faculty, have qualifications equivalent to those required of a graduate of the University of Sydney, may apply for admission as candidates for the degree of master.

Candidates engage in research culminating in a thesis for four to six semesters full-time or pro rata part-time. Some honours graduates (or equivalent) may be eligible for a minimum candidature of two semesters full-time. The first full year of candidature is normally on probation.

### Master of Agriculture, Graduate Diploma in Agriculture and Graduate Certificate in Agriculture

Postgraduate studies are available towards a Master of Agriculture, Graduate Diploma in Agriculture and Graduate Certificate in Agriculture.

Admission requirements for the Master of Agriculture, Graduate Diploma in Agriculture and Graduate Certificate in Agriculture are normally a bachelor's degree or an equivalent qualification. In some instances the admission requirements may be met by evidence of general or professional qualifications and appropriate work experience to indicate that the student has the academic preparation and capacity to complete the course in question. With the approval of the Dean, students may be granted admission with advanced standing if they have completed relevant prior learning at an equivalent level elsewhere.

Many units are based on compulsory fieldwork carried out prior to the commencement of semester. All coursework students should be available to participate in fieldwork excursions two weeks prior to the commencement of semester.

Students may transfer between courses and receive credit for any completed units, provided they have not taken out the award from which they are transferring.

The Graduate Certificate, Graduate Diploma and the Master of Agriculture testamur will specify the area of specialisation: Agribusiness, Agricultural Economics, Agricultural Technologies, Natural Resource Management, Resource Economics, Sustainable Agriculture or Turf Management.

### Graduate Certificate in Agriculture

Candidates for the Graduate Certificate complete a total of 24 credit points (cp) made up of 12cp from their selected specialisation as specified in TABLE A and the balance from elective units chosen from any other units listed in TABLE D (subject to meeting prior learning requirements and timetabling). Students who have completed relevant prior learning at an equivalent level may be given up to 6cp advanced standing.



## 8. Postgraduate course requirements

**Table A**

Program	Core units
Agribusiness	At least two of AGEC5301, AGEC5401, AGEC5403, AGEC5404
Agricultural Economics	At least two units of study beginning with the prefix AGEC54
Agricultural Technologies	At least two units of study beginning with the prefix AFNR51 or AFNR52 or AFNR53 or AFNR55
Natural Resource Management	At least two of RSEC5431, RSEC5432, AFNR5501, AFNR5502, AFNR5506, AFNR5507, AFNR5509, AFNR5510
Resource Economics	At least two of RSEC5431, RSEC5432, RSEC5433
Sustainable Agriculture	At least two of RSEC5431, RSEC5432, AFNR5201, AFNR5202, AFNR5204, AFNR5205, AFNR5206, AFNR5207, AFNR5208
Turf Management	At least two units of study beginning with the prefix AFNR56

### Graduate Diploma in Agriculture

Candidates for the Graduate Diploma complete a total of 36cp made up of 12cp from their selected specialisation as specified in TABLE B and the balance from elective units chosen from any other units listed in TABLE D (subject to meeting prior learning requirements and timetabling). Students may choose to undertake a research project of 12 cp by enrolling in AFNR5901 and AFNR 5905 and this will be used to determine their specialisation. All research projects will commence in Semester 1 unless exemption is approved by the Dean. Students who have completed relevant prior learning at an equivalent level may be given up to 12cp advanced standing.

**Table B**

Program	Core units
Agribusiness	At least two of AGEC5301, AGEC5401, AGEC5403, AGEC5404
Agricultural Economics	At least two units of study beginning with the prefix AGEC54
Agricultural Technologies	At least two units of study beginning with the prefix AFNR51 or AFNR52 or AFNR53 or AFNR55
Natural Resource Management	At least two of RSEC5431, RSEC5432, AFNR5501, AFNR5502, AFNR5506, AFNR5507, AFNR5509, AFNR5510
Resource Economics	At least two of RSEC5431, RSEC5432, RSEC5433
Sustainable Agriculture	At least two of RSEC5431, RSEC5432, AFNR5201, AFNR5202, AFNR5204, AFNR5205, AFNR5206, AFNR5207, AFNR5208
Turf Management	At least two units of study beginning with the prefix AFNR56

### Master of Agriculture

Candidates for the Master of Agriculture complete a total of 48cp made up of a research project equating to 24cp (see TABLE C) and the balance from elective units of study chosen from TABLE D (subject to meeting prior learning requirements and timetabling). All research projects will commence in Semester 1 unless exemption is approved by the Dean. The choice of research project will be used to determine the specialisation. Students who have completed relevant prior learning at an equivalent level may be given up to 12cp advanced standing.

**Table C**

Code	Unit	SEM
AFNR5901	Research Review	1
AFNR5904	Research Proposal and Approach	1
AFNR5905	Research Paper	2

Code	Unit	SEM
AFNR5906	Research Communication	2

**Table D**

Code	Unit	Sem
AFNR5003	Biometry	2
AFNR5101	Plant Agricultural Biotechnology	2
AFNR5102	Food Science A	1
AFNR5103	Food Science B	1
AFNR5106	Ecochemistry	2
AFNR5107	Analytical Chemistry A	1
AFNR5109	Plant Breeding	2
AFNR5201	Crop Agronomy	1
AFNR5205	Production Horticulture	1
AFNR5207	Issues in Horticultural Science	1
AFNR5208	Research and Practice in Horticultural Science	2
AFNR5301	Plant Disease	1
AFNR5303	Adv Mycology & Plant Pathology	1
AFNR5304	Soil Biology	1
AFNR5305	Integrated Pest Management	2
AFNR5306	Insect Taxonomy & Systematics	1
AFNR5501	The Soil Resource	2
AFNR5502	Remote Sensing, GIS and Land Management	2
AFNR5506	Limnology and Water Quality	1
AFNR5507	Landscape Hydrology and Management	1
AFNR5509	Contemporary Field & Lab Soil Science	1
AFNR5510	The Soil at Work	2
AFNR5601	Turf Management	1
AFNR5602	Advanced Turf Management	2
AFNR5603	Turf Species and Varieties	1
AFNR5604	Diagnostic Methods in Turf Management	1
AFNR5605	Applied Plant Ecology	2
AFNR5901	Research Review	1
AFNR5904	Research Proposal and Approach	1
AFNR5905	Research Paper	2
AFNR5906	Research Communication	2
AGEC5301	Agribusiness Management	1
AGEC5303	Applied Optimisation	1
AGEC5304	Research Methods	1
AGEC5402	Agricultural Development Economics	2
AGEC5404	Agribusiness Analysis	1
AGEC5405	Quantitative Planning Methods	1
RSEC5431	Benefit-Cost Analysis	1
RSEC5432	Environmental Economics	1
RSEC5433	Economics of Mineral & Energy Industries	2



## 9. Postgraduate units of study

### AFNR5003

#### Biometry

**Credit points:** 6 **Teacher/Coordinator:** Dr Thomas Bishop **Session:** Semester 1 **Classes:** 5 hrs workshops/wk, individual consultation and research 1 hr/wk **Assumed knowledge:** BIOM2001 or equivalent **Assessment:** Reports (25%), assignment (20%), presentation (5%), exam (50%). All open book.

This unit is an elective available to students enrolled in either the GradCertAgr, GradDipAgr or MAgr degrees. It is designed for students who are interested in research and is intended to further develop your skills in experimental design and statistical modeling. It builds on the topics introduced in the undergraduate unit Biometry 2, and aims to give students sufficient skills and confidence to complete the analysis of their own research data. As such it is particularly useful for MAgr students completing the Research Project, AFNR5903. We start by learning how to determine the number of replicates to use in an experiment. We revise multiple regression and extend the linear model to a time series system. We then examine how normally distributed data from designed experiments can be analysed in a general linear model framework, and hence how to cope with missing or incomplete data. The difference between maximum likelihood and residual maximum likelihood (REML) is studied for a single sample. A REML analysis is obtained for complete and incomplete factorial designs; for fixed, random and mixed models; for data collected from repeated observations on the same experimental unit. Next, we consider various techniques for the analysis of non-normal data, specifically: logistic regression for binary and proportion data; Poisson regression for count data; loglinear modelling for multi-way contingency tables; ordinal and nominal logistic regression for scores & ratings. The assignment is to design and analyse data from either an undergraduate 4th year or postgraduate coursework student research project.

#### Textbooks

Clewer, A.G. and Scarisbrick, D.H. (2001). *Practical Statistics and Experimental Design for Plant and Crop Science*. West Sussex: John Wiley & Sons.

Dytham, C. (2003). *Choosing and Using Statistics: A Biologist's Guide*. Oxford: Blackwell.

Mead, R., Curnow, R.N. and Hasted, A.M. (2003). *Statistical Methods in Agriculture and Experimental Biology*, 3rd ed. Boca Raton: Chapman & Hall/CRC.

### AFNR5101

#### Plant Agricultural Biotechnology

**Credit points:** 6 **Teacher/Coordinator:** Prof Peter Sharp **Session:** Semester 2 **Classes:** 24hrs lectures and 36 hours of other work (practicals, computer database examination, seminars) **Prohibitions:** GENE4013 **Assessment:** 3hr exam, reports, assignment.

Lectures and other work covering the structure and function of plant genomes and genes, the technology and results of DNA transformation and the analysis of plant traits by molecular techniques including by genetic mapping using molecular and other genetic markers.

### AFNR5102

#### Food Science A

**Credit points:** 6 **Teacher/Coordinator:** Dr Meredith Wilkes, (Coordinator), Dr Robert Caldwell, Prof Les Copeland **Session:** Semester 1 **Classes:** 36 hrs of lectures and 24 hrs of laboratory during the semester **Prohibitions:** AGCH3025 **Assessment:** One 2hr exam, laboratory reports, assignment.

This unit of study aims to give students an understanding of the constituents of foods and fibres.

The lecture topics cover the chemistry, biochemistry and processing behaviour of major food constituents - oligosaccharides, polysaccharides, lipids and proteins; the relationship between molecular structure of constituents and their functionality in foods; anti-nutritional and toxic constituents of plants and foods; chemistry of dietary fibre; wheat flour doughs and protein chemistry during baking

and cooking; foams and emulsions, thickening agents; enzymes in foods and food processing.

The laboratory exercises aim to give students an understanding of the methods used in the analysis of foods and other biological materials, and will include analysis of carbohydrates including starch; wheat flour swelling volume and the RVA; analysis of edible oils; spectroscopic and enzymic methods.

### AFNR5103

#### Food Science B

**Credit points:** 6 **Teacher/Coordinator:** Dr Robert Caldwell (Coordinator), Dr Meredith Wilkes, Prof Les Copeland **Session:** Semester 1 **Classes:** 36 hrs of lectures and 24 hrs of laboratory during the semester **Prohibitions:** AGCH3026 **Assessment:** One 2hr exam, laboratory reports, oral presentation.

This unit aims to give students an understanding of the chemistry, biochemistry and biotechnology of analytical and diagnostic methods and manufacturing processes used in the conversion of raw products into foods. In the lecture component topics covered will include the sustainable production of major food crops; the role of genetically modified crops in food sustainability and quality; principles and methods in food quality control and assessment; chemical and biochemical aspects of food quality in relation to food processing and nutritional values. The laboratory exercises aim to give students an understanding of the methods used in the analysis of foods and other biological materials, and of the functionality of food components and ingredients. On completing this unit, students will have gained an enhanced understanding of food production and manufacturing systems, the processing of raw ingredients into food products, and food analysis and evaluation.

### AFNR5106

#### Ecochemistry

**Credit points:** 6 **Teacher/Coordinator:** Professor Ivan Kennedy, Dr Robert Caldwell **Session:** Semester 2 **Classes:** 20 hr lectures and tutorials, 25 hr prac and 5-day field trip in the AVCC break **Prohibitions:** AGCH3030, AGCH3031, AGCH3032 **Assumed knowledge:** Intermediate level material in the areas of agricultural chemistry, chemistry, biochemistry **Assessment:** One 2 hr exam (50%), field trip report(s) (25%), prac reports (25%).

This field-oriented unit will develop professional expertise in rural ecochemistry, measuring impacts on sustainability and seeking solutions to chemical problems at the catchment scale. AFNR5106 builds on intermediate and senior units in environmental chemistry or biochemistry. It will promote knowledge and professional skills related to key chemical processes in ecosystems causing risks to soil and water resources, the quality of agricultural produce and to ecological biodiversity. These will be examined by quantitative risk analysis, targeted monitoring and remediation, seeking innovative solutions (e.g. IPM and genetic modification).

A field trip in the AVCC break and professional report will investigate relevant case studies at selected centres in eastern Australia doing innovative research on global warming and climate change, soil and water quality and environmental protection. Lectures will provide knowledge in the environmental C, N and S cycles important for sustaining action in ecosystems, the nature of greenhouse gases and mitigation of their production including C sequestration, risks to biota (soil, water, plants, animals) from acidification and innovative means of remediation, environmental risk from pesticides and other pollutants, monitoring and their remediation. In laboratory exercises, students will gain skills in relevant analyses using GC, LC, mass spectrometry and ELISA. The assessment procedures are designed to provide students with skills in definition of research problems and risk



assessment, quality in analyses, risk management and remediation, and effective communication of outputs.

#### AFNR5107

##### Analytical Chemistry A

**Credit points:** 6 **Teacher/Coordinator:** Dr Robert Caldwell (Coordinator) **Session:** Semester 1 **Classes:** 22 hrs of lectures and 32 hrs of laboratory during the semester **Prohibitions:** AGCH4007 **Assessment:** One 2-hr exam (30%), laboratory reports (30%), major assignment (40%).

Lecture, reading list and laboratory topics will cover the theory and fundamentals of both common and advanced instrumentation used in analytical chemistry. Topics will cover ion selective electrode technology, pH meters, and other electrochemical devices; centrifuge and ultracentrifuge instrumentation, maintenance and applications, instrumentation in atomic and molecular spectrophotometry, gas and liquid chromatography, gel and capillary electrophoresis; automated derivatization methods; mass spectrometry, and immuno-analytical technology.

#### AFNR5108

##### Plant Cytogenetics

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Dr Norm Darvey **Session:** Semester 2 **Classes:** 24hrs lectures and 36 hours of other work (practicals, computer database examination, seminars) **Prohibitions:** GENE4011 **Assessment:** 3hr exam, reports, assignment.

Lectures in cytology and cytogenetics, with special emphasis on cereals and the application of chromosome engineering to plant breeding. The laboratory unit includes routine cytological procedures and tissue culture technology.

#### AFNR5109

##### Plant Breeding

**Credit points:** 6 **Teacher/Coordinator:** Prof Richard Trethowan **Session:** Semester 2 **Classes:** 24hrs lectures and 36 hours of other work (practicals, computer database examination, seminars) **Prohibitions:** GENE4012 **Assessment:** 3hr exam, reports, assignment.

Lectures and practical work devoted to the theory, philosophy and practice of plant breeding, screening techniques, conservation of genetic variability, breeding for disease resistance, the use of tissue culture in breeding, with examples from both field and horticultural crops.

#### AFNR5201

##### Crop Agronomy

**Credit points:** 6 **Teacher/Coordinator:** Dr Lindsay Campbell **Session:** Semester 1 **Classes:** Block intensives/workshops, excursion **Assumed knowledge:** Equivalent of (AGRO3004 or AGRO3002) and (PLNT2003 Plant Form and Function or PLNT2903 Plant Form and Function (Advanced)) **Assessment:** Report, oral presentations and exam.

This unit examines agronomy as the discipline that underpins agricultural production. Two industries are studied to gain appreciation of the main agronomic principles of crop production. Most principles can be applied to dryland crops even though the emphasis in this unit is on irrigated crops. As a case study, the cotton industry is examined in detail to understand the end-user and social demands on agricultural production, the technical issues that challenge the farmer and the diversity of other specialist information from relevant disciplines such as entomology, pathology and soil science that must be integrated into the farming system. Likewise the rice industry provides a contrasting farming system as another case study. The unit includes a one-week excursion to cotton growing areas in northern NSW, specialist intensive instruction provided by the Cotton CRC and a series of workshops) tutorials that provides analysis and synthesis of the major farming systems in this industry.

#### AFNR5202

##### Professional Practice in Agronomy

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Dr Lindsay Campbell **Session:** Semester 1 **Classes:** Pracs, workshops as advised, field work **Assumed**

**knowledge:** Equivalent of BIOM2001 Biometry 2 and (AGRO3001 Agronomy 3 or AGRO3002 Agronomy 3). Students should have a grasp of experimental design and analysis **Assessment:** Reports.

This unit provides training in the professional skills specific to the practice of agronomy. Students will design and execute field experiments for a sustainable agricultural system. A challenge is to undertake experiments within the field constraints eg soil, previous cropping history etc. Several case studies involving client-driven experimental or R&D projects both in the field and laboratory will be used to illuminate sound professional practice, including budget management, in field and laboratory experimental design and methodology, data acquisition and assimilation and compilation of professional reports. Assessment will be based on professional involvement in the case studies and on the final reports. Students participate in a long-term experiment that involves planning, decision making and management of a farming system.

#### AFNR5204

##### Crop Water Management

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Prof Bruce Sutton **Session:** Semester 2 **Classes:** (3 tut, 2hr prac)/wk **Assumed knowledge:** PLNT2003 or PLNT2903 **Assessment:** One 2 hr exam (45%), consultancy report (45%), practical reports (10%).

This unit of study provides a scientific understanding and practical working knowledge of water management in dryland and irrigated agricultural systems, with most of the emphasis at the field scale. The first section of the unit examines the mechanisms underlying a crop water balance, its calculation and measurement and management options for using rainfall as effectively as possible. The second section examines the major forms of irrigation, the scientific principles involved in each, their benefits and shortcomings and management to maximize water use efficiency. The practical classes will develop key skills appropriate to irrigation system management and use of current decision support systems. Postgraduate students will be expected to understand the details of the scientific concepts that underpin this unit at a greater depth than undergraduates pursuing AGRO4005 and should be able to reflect this in a more sophisticated and richer and hence significantly longer consultancy report and a demonstration of greater grasp of knowledge in the examination.

##### Textbooks

M.E. Jensen (1980). Design and Operation of Farm Irrigation Systems (ASAE). Allen, R.G, Periera, L.S., Raes, D. and Smith, M. (1998). Crop Evapotranspiration. Guidelines for computing crop water requirements. FAO Irrigation and Drainage Paper 56.  
Hillel, D. (2004). Introduction to Environmental Soil Physics. Elsevier Academic Press.

#### AFNR5205

##### Production Horticulture

**Credit points:** 6 **Teacher/Coordinator:** Dr Jenny Jobling **Session:** Semester 1 **Classes:** (2 lec; 1 x 3hr prac/workshop)/wk **Assumed knowledge:** Equivalent of (AFNR1001 and AFNR1002) or (HORT1001 and HORT1002) and HORT2002. **Assessment:** One 3 hr exam (55%), three assignments (45%).

This unit of study covers topics on the production of perennial fruit crops, wine grapes, the sustainable production of vegetables and it also covers the key aspects of the postharvest handling and quality assurance of fresh produce. At the end of this unit students are expected to have a detailed understanding of these areas of horticulture and be able to discuss related literature and the physiological principles underlying the commercial success of these horticultural enterprises. Students will also gain research and enquiry skills through research based practical sessions and assignments.

##### Textbooks

Reference Books:  
Louis Glowinski (1991) The complete Book of Fruit Growing in Australian. Lothian Books  
Baxter, P. (1997) Growing Fruit In Australia. MacMillan Australia  
Westwood, M.N. (1993) Temperate-Zone Pomology. Timber Press Inc.

**AFNR5206****Postharvest Biology and Technology**

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Dr Robyn McConchie **Session:** Semester 1 **Classes:** (2 lec & 4 prac)/wk **Assumed knowledge:** HORT1001, HORT1002, HORT2002 **Assessment:** Exam 2 hr (60%), laboratory reports (25%), assignment (10%), seminar (5%).

The unit develops understanding and skills relevant to the maintenance of quality during the harvesting, handling, storage and marketing of fresh plants and plant parts. The subject integrates the postharvest physiology of products that are handled or marketed in a living state, with the technological and economic challenges associated with delivering them from the field to the consumer. Supply chain analysis of crops will be examined via case study examples, drawn from fruits, vegetables, cut flowers, nursery and foliage crops, turf and edible fungi. Students will study all operations from harvesting to consumer evaluation.

**Textbooks**

Wills, R., McGlasson, B., Graham, D. and Joyce, D. "Postharvest: An Introduction to the Physiology and Handling of Fruit, Vegetables and Ornamentals." UNSW Press 4th Edition.

**AFNR5207****Issues in Horticultural Science**

**Credit points:** 6 **Teacher/Coordinator:** Dr Brian Jones **Session:** Semester 1 **Classes:** 2 lectures per week for 13 weeks & 6 prac per 13 weeks **Assumed knowledge:** HORT3004 or equivalent. **Assessment:** Exam (2 hr) (25%), plant ID practical quizzes (15%), consulting report (45%), seminar presentation (15%).

This unit links a range of horticultural science topics with commercial applications. One element is designed around a "supply chain" framework, applied to multiple "real world" case studies. It will develop skills in data analysis and interpretation, problem identification and problem solving. Students will understand how multiple issues must be integrated in order to provide fresh solutions to technical or commercial challenges and opportunities. A second element exposes students to the research work at the Royal Botanic Gardens at Mt Annan. This illustrates the importance of horticultural science to conservation issues. It also covers opportunities and barriers regarding the commercial use of native flora.

**AFNR5208****Research and Practice in Hort Science**

**Credit points:** 6 **Teacher/Coordinator:** Dr Brian Jones **Session:** Semester 2 **Classes:** 2h tut/wk; one 1-week excursion **Assessment:** Tutorial papers (30%), project proposal (10%), project report (50%), peer review (10%).

Upon completion of this unit, students will have participated in a major excursion and a series of discussion workshops based on prescribed readings that will broaden their appreciation of current research themes in horticultural science, industry issues, stimulate critical thinking, enhance professional research skills and give an insight into the career opportunities for horticultural scientists. Attendance at seminars, written reports and presentations made during these workshops will improve student skills in critical analysis and communication.

**AFNR5209****Sustainable Cropping Systems**

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Prof Bruce Sutton, Dr Daniel Tan, Dr Brett Whelan **Session:** Semester 1 **Classes:** (3 tut, 2hr prac)/wk **Assumed knowledge:** PLNT2003 or PLNT2903 or equivalent. **Assessment:** One 2 hr exam (45%), consultancy report (45%), practical reports (10%).

*Note: Department permission required for enrolment.*

Agronomy studies the practices and underlying concepts of sustainable crop and pasture production. The scientific basis of modern practices used in crop production, particularly those relevant to New South Wales, is explored. This knowledge is used to appreciate the scale of future problems such as climate change, soil degradation and increased costs of petrochemical-based inputs like fuel and fertilizer. Possible responses to these problems that will help maintain productivity will be examined. The relationship between agricultural production and natural resource management is also considered as

part of a modern production environment, with the impact of recent legislation supporting Ecologically Sustainable Development on agriculture and the agricultural response to it as the focus of discussion. The practical classes will develop key skills appropriate to precision agriculture and use of current decision support systems. Postgraduate students will be expected to understand the details of the scientific concepts that underpin this unit at a greater depth than undergraduates pursuing AGRO4005 and should be able to reflect this in a more sophisticated and richer and hence significantly longer consultancy report and a demonstration of greater grasp of knowledge in the examination.

**AFNR5301****Plant Disease**

**Credit points:** 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** (2 lec, 3 labs)/wk **Assumed knowledge:** MICR2024 or equivalent. **Assessment:** One 2hr end of semester exam (60%), one prac exam (25%), six take-home quizzes (15%).

This unit introduces plant disease and the pathogens that limit agricultural and horticultural production. The unit is core to the BScAgr and BHortSc degrees and is available as an elective to BLWS and BSc students. It builds on the material introduced in MICR2024. The lecture component of the unit discusses the aetiology of plant disease and symptom development; diagnosis of plant disease; the biology, epidemiology and management of fungi and other microbes that cause plant disease; breeding for disease resistance; plant-parasite relationships; and disease resistance in plants. The practical component introduces techniques used in handling and identifying fungi and in studying plant disease, and develops skills in experimental design, execution and interpretation of experimental data. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments and lecture discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of practical reports), expand from theoretical principles to practical explanations (through observing and reporting on practical work), use certain computer software for analysing data and reporting on laboratory projects. Students learn to work in a research team, plan effective work schedules (to meet deadlines for submission of assessable work), use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through research based group projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

**Textbooks**

Schumann GL & Darcy CJ 2006. Essential Plant Pathology. APS Press, St Paul, Minn., USA.

**AFNR5303****Adv Mycology and Plant Pathology**

**Credit points:** 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** (2 tut, 3 hrs prac)/wk **Assumed knowledge:** PPAT3003 or equivalent **Assessment:** Two hour end of semester exam (70%), 1500-word review paper (30%).

This unit investigates evolution, systematics, taxonomy and biology of fungi and their role as plant pathogens; plant disease epidemiology and understanding fungal populations; infection processes and plant defence. The unit is an elective for BScAgr, BHortSc and BSc students. It builds on the material introduced in PPAT3003 and BIOL3017. Undertaking this unit will develop skills in isolating and identifying plant pathogenic fungi, diagnosing plant diseases, designing, conducting and analysing experiments. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments, projects and tutorial discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of project reports), and expand from theoretical principles to practical explanations (through observing and reporting on project work). Students will consolidate their teamworking skills, develop self-directed study skills and plan effective work schedules, use statistical analysis in research, keep appropriate records of

laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through individual and group research projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

#### Textbooks

Agrios GN. 2005. Plant Pathology 5th ed. Academic Press  
Plant pathogens and plant diseases / edited by J.F. Brown and H.J. Ogle; endorsed by the Australasian Plant Pathology Society Inc. Armidale, N.S.W.: Rockvale Publications for the Division of Botany, School of Rural Science and Natural Resources, University of New England, 1997.  
Carlile MJ. The Fungi 2nd ed. Academic Press  
Kendrick B. 2001. The Fifth Kingdom 3rd ed. Mycologue Press, Ontario. www.mycology.com

### AFNR5304

#### Soil Biology

**Credit points:** 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** (2 tut, 3 hrs prac)/wk **Assessment:** Tutorial papers (30%), project proposal (10%), project report (50%), peer review (10%).

This unit investigates the diversity of organisms living in the soil, their biology, interactions and ecology, and their roles in maintaining and improving soil function. The unit is an elective for BScAgr, BHortSc and BSc students. It builds on the material introduced in MICR2024, PPAT3003 and BIOL3017. Undertaking this unit will develop skills in monitoring soil microbes, designing, conducting and analysing experiments. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments, projects and tutorial discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of project reports), and expand from theoretical principles to practical explanations (through observing and reporting on project work). Students will consolidate their teamworking skills, develop self-directed study skills and plan effective work schedules, use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through group research projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

#### Textbooks

Sylvia et al. 2005. Principles and Applications of Soil Microbiology 2nd ed. Pearson.  
Schjonning PJ. 2001. Managing Soil Quality. CAB International.

### AFNR5305

#### Integrated Pest Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Sarah Mansfield **Session:** Semester 2 **Classes:** (1x2hour lec/tut, 1x3hour prac, 1x1hour insect collection)/wk **Assumed knowledge:** ENTO2001 or equivalent. **Assessment:** 1 x 2hr exam (40%), 1 x field diary (15%), 1 x group assignment (15%), 1 x insect collection (15%), 1 x essay (15%).

Applied entomology deals with the control of insect pests and the use of beneficial insects. The primary focus of this unit is the development and adoption of integrated pest management within Australian agriculture. The biology of major pest (herbivores and disease vectors) and beneficial (predators, parasitoids, pollinators) insect groups is covered in depth. The advantages and disadvantages of biological, cultural and chemical pest control methods are described using examples from Australian cropping systems. The role of host plant resistance and genetically modified crop varieties is also examined. Students will consider the relative importance of insect ecology, pest control methods and socio-economic factors to successful adoption of integrated pest management. The practical component of the course includes an individual insect collection, some laboratory sessions and day field trips. Students will work in small groups to prepare an oral presentation. Knowledge of ENTO2001 or an equivalent introductory entomology course is assumed.

#### Textbooks

Pedigo, LP and Rice, ME. 2009. Entomology and Pest Management, 6th edn. Pearson Prentice Hall, 784 pp.

### AFNR5306

#### Insect Taxonomy and Systematics

**Credit points:** 6 **Teacher/Coordinator:** Dr Sarah Mansfield **Session:** Semester 1 **Classes:** (1x2hr lec/tut, 1x2hr museum project, 1x2hr insect collection)/wk **Assumed knowledge:** ENTO2001 or equivalent. **Assessment:** 1 x 2hr exam (30%), 1x museum project (20%), 1 x insect collection (20%), 1 x class participation (10%), 1 x essay (20%).

Correct taxonomic identification of insect species is essential for all areas of entomological research. Knowledge of the evolutionary relationships between insect groups contributes to our understanding of insect biology and ecology. Key concepts that underpin the study of insect systematics, biogeography and phylogeny are described using examples from the evolutionary development of insects. The role of morphological, genetic and molecular studies in the classification of insects is examined including the use of specialist software for data analysis. This unit extends the student's knowledge of insect taxonomy through field collections and museum studies of a particular insect group (chosen by the student). Knowledge of ENTO2001 or an equivalent introductory entomology course is assumed.

#### Textbooks

No Required textbook. Recommended: Naumann, I 1993. CSIRO Handbook of Australian Insect Names. 6th edition, CSIRO Entomology, Melbourne, Vic. 200 pp.  
Triplehorn, CA & Johnson, NF 2005. Borror and DeLong's introduction to the study of insects. 7th edition, Thomson Brooks/Cole, Belmont, CA, 864 pp.

### AFNR5501

#### The Soil Resource

**Credit points:** 6 **Teacher/Coordinator:** Dr Stephen Cattle (Coordinator), Prof Alex McBratney, A/Prof Balwant Singh **Session:** Semester 2 **Classes:** (2 lec, 2 pracs)/wk, 24 hr (5 days) field work out of semester time **Assessment:** Fieldtrip participation (5%), soil survey mapping report (30%), laboratory report and poster presentation (25%), three group tutorials (20%), viva voce exam (20%)

The unit of study is designed to provide a detailed knowledge of the important features and problems of Australian soils. By the end of this unit of study, students will develop skills in describing and interpreting soil profile features in the field. They will become familiar with quantitative soil data handling procedures and be able to do quantitative soil mapping; and measure common soil properties in the laboratory. They will also learn to work in a team environment and write a report on soil mapping and laboratory analysis.

The lecture topics include- Features, geography and management of Australian soils; Digital soil mapping - concepts and spatial prediction of soil classes; Soil quality, soil health and soil function - physical, biological and chemical indicators of soil sustainability; Soil structure: The elements of soil structure and methods of their assessment; The degradation and amelioration of soil structure and its effect on agriculture; Soil water erosion - detachment, entrainment, runoff and deposition; Soil acidification: effects of soil acidity in soils, forms of soil acidity, sources of soil acidity, buffering mechanisms in soils, soil pH and Al availability, extent of soil acidity in Australia and remediation of soil acidity; Soil salinity: causes, sources of salts, nature of soil salinity, salinity parameters in soil and water, effects of salinity on plant growth, management of soil salinity; Soil contamination: concepts/definitions, sources of contaminants, effects of contaminants, major contaminants in soil, remediation of contaminated soils; soil carbon accounting.

### AFNR5502

#### Remote Sensing, GIS and Land Management

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Inakwu Odeh **Session:** Semester 2 **Classes:** 2 lec, 1tut & 4hr prac/wk (wks 1-6); Project: (wks 7-12) **Prerequisites:** Recommended courses include ENVX3001 (Environmental GIS), SOIL2004 (The Soil Resource), GEOS3007 (Remote Sensing: Imaging the Earth), GEOS3014 (GIS in Coastal Management), GEOG5001 (Geographic Information Science A) and GEOG 5002 (Geographic Information Science B) **Assumed knowledge:** Some knowledge of GIS and spatial information systems and/or some knowledge of soil science, geomorphology and environmental science **Assessment:** Lab prac reports, group work, presentation and project report.

This unit of study is aimed at advanced techniques in Remote Sensing (RS), linked with Geographical Information Systems (GIS), as applied to land management problems. We will review the basic principles of GIS and then focus on advanced RS principles and techniques used for land resource assessment and management. This will be followed by practical training in RS techniques, augmented by land management project development and implementation based on integration of GIS and RS tools. The unit thus consists of three separate but overlapping parts: 1) a short theoretical part which focuses on the concepts of RS; 2) a practical part which aims at developing hands-on skills in using RS tools, and 3) an application-focused module in which students will learn the skills of how to design a land management project and actualise it using integrated GIS and RS techniques.

Syllabus summary: Lectures will cover: Overview of the basic principles of Geographical Information Science (GISc), Advanced principles of remote sensing, Land resource information and data capture using RS, Digital elevation modelling and terrain analysis using remote sensing; Image enhancement and visualization; Image classification and interpretation; RS data interpretation for land resource inventory; RS and GIS for land use and land cover change analysis; Coupling of models of land resource assessment with GIS and RS. Fifty percent of learning time will be devoted to the design and implementation of projects, which can be selected from GIS and RS applications in: agricultural land management, vegetation studies, water and catchment (hydrological) studies; land-cover and land-use change modelling, pesticide and herbicide environmental risk assessment, environmental impact analysis, land degradation modelling including soil salinity, soil erosion, etc.

#### Textbooks

van Dijk, A. and Bos, M.G. 2001. GIS and remote sensing techniques in land- and water-management. Kluwer Academic Publisher, Dordrecht.  
Skidmore, A. 2002. Environmental modelling with GIS and remote sensing. Taylor & Francis, London.  
Jesen J. R. 2007. Remote sensing of the environment: an earth resource perspective. 2nd ed. Pearson Prentice Hall Upper Saddle, New Jersey.

### AFNR5506

#### Limnology and Water Quality

**Credit points:** 6 **Teacher/Coordinator:** Dr Dhia Al Bakri (Coordinator), Prof Ivan Kennedy, Dr Robert Caldwell **Session:** Semester 1 **Classes:** 6-day field trip in orientation week, 26 hr lec/tut, 20 hr prac **Prohibitions:** AGCH3030 **Assumed knowledge:** GEOG2303, LWSC2002, AGCH2003 or equivalent **Assessment:** 2 hr exam (50%), laboratory reports (25%), field trip professional report (25%).

This unit of study will provide students with an understanding of the main Australian water quality problems, related limnological issues and the underlying causes and processes. The unit commences with a field trip module to the productive Namoi and the Macquarie Valleys, where agriculture based on irrigation, environmental impacts on vegetation, soil and water of agricultural enterprises such as cotton farming and human settlements will be assessed. Field observations on pH, nutrient and salt content, pesticide contamination, and microbial content will be made on water, sediment, soils and in constructed wetlands, with samples returned for more detailed laboratory analysis at the University. The unit will also investigate sources and pathways of pollutants reaching streams, lakes and reservoirs, determine the interactions between runoff and water quality, and identify pollution control measures within the context of integrated catchment management (ICM). The unit will cover aspects of freshwater ecology with particular emphasis on wetlands ecosystem, riparian vegetation, macrophytes, phytoplanktonic communities and cyanobacteria. At the completion of this unit, the students will be able to determine different water quality and pollution problems in Australian water bodies; explain underlying causes and processes, relate the interaction between flow and water quality and evaluate their implications on catchment management. The students will also be able to employ limnological modeling to predict heat budget distribution; catchment loading and mass balance of given pollutants, and select appropriate pollution control and management strategies.

#### Textbooks

Wetzel R G 2001. Limnology: Lake and reservoir ecosystems, 3rd edn, Academic Press London.  
Dodson S. I. 2005. Introduction to Limnology. McGraw-Hill Book Company, New York.

### AFNR5507

#### Landscape Hydrology and Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Willem Vervoort (Coordinator), Dr. Dhia Al Bakri **Session:** Semester 1 **Classes:** (2 lec, 0.6 on-line 2.4 prac )hr/wk **Assumed knowledge:** Basic hydrology, AFNR5506 or equivalent **Assessment:** On-line activities 10%; oral presentation 10%; practical reports 50%; 2 hr exam 30%

This unit of study is designed to allow students to examine catchment-scale hydrological modeling and groundwater hydrogeochemistry as an investigative tool for water quality and policy making at the catchment level. It assumes a background in basic hydrology, water quality and chemistry.

In the first part, students will learn how to develop their own simulation model of catchment hydrological processes in R and review the possibilities and impossibilities of using simulation models for catchment management. In the second part students will apply hydrogeochemical techniques to investigate groundwater quality and review recent developments in catchment-based management strategies to control salinity and pollution. At the end of this unit, students will be able to build their own catchment model and calibrate this model, articulate advantages and disadvantages of using simulation models for catchment management, justify the choice of a simulation model for a particular catchment management problem, identify issues in relation to uncertainty, apply hydrogeochemical investigation techniques for groundwater and describe innovative strategies for salinity and pollution control. The students will gain research and inquiry skills through research based group projects, information literacy and communication skills through on-line discussion postings, laboratory reports and a presentation and personal and intellectual autonomy through working in groups.

#### Textbooks

Beven, K.J. Rainfall-Runoff modeling, The Primer, John Wiley and Sons, Chichester, 2001  
Kumagai, M. and Warwick, W. F. 2003. Freshwater management: Global versus local perspectives, Springer-Verlag, Tokyo.

### AFNR5509

#### Contemporary Field and Lab Soil Science

**Credit points:** 6 **Teacher/Coordinator:** Prof Alex McBratney (coordinator), Associate Professor Balwant Singh, Dr Stephen Cattle, Dr Budiman Minasny **Session:** Semester 1 **Classes:** 6-day field excursion; 2 lec & 2 prac/wk **Assessment:** One 2hr exam; pedology, soil physics and soil chemistry written assessments; group presentation, synthesis paper.

This is a theoretical and empirical unit providing specialised training in three important areas of contemporary soil science, namely pedology, soil chemistry and soil physics. The key concepts of these sub-disciplines will be outlined and strengthened by hands-on training in essential field and laboratory techniques. All of this is synthesised by placing it in the context of soil distribution and use in North-Western New South Wales. The unit is motivated by the teaching team's research in this locale. It builds on students existing soil science knowledge. After completion of the unit, students should be able to articulate the advantages and disadvantages of current field & laboratory techniques for gathering necessary soil information, and simultaneously recognise key concepts and principles that guide contemporary thought in soil science. Students will be able to synthesise soil information from a multiplicity of sources and have an appreciation of the cutting edge areas of soil research. By investigating the contemporary nature of key concepts, students will develop their skills in research and inquiry. Students will develop their communication skills through report writing and oral presentations and will also articulate an openness to new ways of thinking which augments intellectual autonomy. Teamwork and collaborative efforts are encouraged in this unit.

#### Textbooks

D. Hillel. 2004. Introduction to Environmental Soil Physics. Elsevier Science, San Diego, CA, USA.

R. Schaetzl and S. Anderson 2005. *Soils: Genesis and Geomorphology*. Cambridge University Press, New York, NY, USA.  
D.L. Sparks 2003 *Environmental Soil Chemistry* (2nd edn). Academic Press, San Diego, CA, USA.

#### AFNR5510

##### The Soil at Work

**Credit points:** 6 **Teacher/Coordinator:** Prof Alex McBratney (coordinator), A/Prof Balwant Singh, Dr Stephen Cattle (facilitators), plus research-only academics **Session:** Semester 2 **Classes:** Problem-based unit: each student completes 2 problems; 4 x 3 hr workshops per problem (each student attends 8 workshops in total) **Assessment:** For each of two scenarios: Statement of the problem report (12.5%) - shared information, two team reports How to tackle problem seminar (12.5%) - team seminars, before fieldwork, analyses done Results seminar (12.5%) - team seminars Final report (12.5%) - individual work.

This is a problem-based applied soil science unit. It is designed to allow students to identify soil-related problems in the real-world and by working in a group and with an end-user to suggest short and long-term solutions to such problems. It utilises and reinforces soil-science knowledge and problem-solving skills gained during the program. This unit will address real-world scenarios which involve soil-related problems such as carbon management, structural decline, acidification, salinisation and contamination. Students will gain some understanding of the concept of sustainability, and will be able to identify the causes of problems by reference to the literature, discussion with landusers and by the design and execution of key experiments and surveys. They will gain a focused knowledge of the key soil drivers to environmental problems and will have some understanding on the constraints surrounding potential solutions. By designing and administering strategies to tackle real-world soil issues students will develop their research and inquiry skills and enhance their intellectual autonomy. By producing reports and seminars that enables understanding by an end-user students will improve the breadth of their communication skills.

##### Textbooks

I.W.Heathcote 1997. *Environmental Problem Solving: A Case Study Approach*. McGraw-Hill, New York, NY, USA.

#### AFNR5601

##### Turf Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Peter Martin **Session:** Semester 1 **Classes:** External studies and residential block **Assumed knowledge:** Practical knowledge of turf cultural practices; basic chemistry and basic biology **Assessment:** One 3 hr examination, two 2,000 word assignments, tutorial papers and practical reports.

This unit examines the scientific basis of turf management for both warm climate and cool climate grasses. Topics include the history and economic importance of managed grass surfaces; the macro- and micro-environment of turf both above and below ground; the physiology of growth under turf conditions including the effects of water, traffic, mowing, cultivation and nutrition; establishment of turf by seed and vegetative methods; and the objective assessment of turf quality.

##### Textbooks

Beard, J.B. *Turfgrass: Science and Culture* (Prentice Hall)  
Atwell, B., Kriedemann, P. and Turnbull, C. *Plants in Action: adaptation in nature; performance in cultivation* (Macmillan Australia)  
Glendinning, J (ed.) *Australian Soil Fertility Handbook* (CSIRO Publications Collingwood).

#### AFNR5602

##### Advanced Turf Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Peter Martin **Session:** Semester 2 **Classes:** External studies and residential block **Prerequisites:** AFNR5601 Turf Management and AFNR5603 Turf Species and Varieties **Assumed knowledge:** Practical knowledge of turf cultural and construction practices; basic chemistry; basic biology **Assessment:** One 3hr examination, one oral presentation, one 2,000 word assignment, tutorial papers and practical reports.

Readings, discussions and practical experiments to gain advanced expertise in laboratory and field aspects of selected areas of plant and soil sciences underlying turf management. Topics include germination and establishment, stress physiology, minimization of water use while maintaining acceptable turf quality, use of saline and downgrade waters for turf irrigation, root growth, growth analysis,

fertilizer and pesticide management, environmental legislation relevant to turf facilities, turf construction materials and techniques, design of turf facilities, quality assurance in turf construction and maintenance of turf constructions.

##### Textbooks

Adams, W.A. and Gibbs, R.J. *Natural Turf for Sport and Amenity* (CAB International, Wallingford).  
Atwell, B., Kriedemann, P. and Turnbull, C. *Plants in Action: adaptation in nature; performance in cultivation* (Macmillan Australia).

#### AFNR5603

##### Turf Species and Varieties

**Credit points:** 6 **Teacher/Coordinator:** Dr Peter Martin **Session:** Semester 1 **Classes:** External studies and residential block **Corequisites:** AFNR5601 Turf Management **Assumed knowledge:** Practical knowledge of main turf species, basic biology **Assessment:** One 3hr examination, one 2,000 word assignment, tutorial papers, practical report and plant collection.

This unit has three main aims: (a) to provide an overview of plant variation, ecotypic differentiation and the principles of plant taxonomy, with special reference to grasses, (b) to teach skills in identification of members of the grass family and related families including detailed morphological terminology and the use of conventional and vegetative taxonomic keys, and (c) to provide an introduction to the methods of development of new turf cultivars by breeding and/or selection. Information is also provided on biochemical methods of identifying grass varieties, comparative testing of turf grasses, plant breeders' rights and cultivar registration.

##### Textbooks

Hubbard, C.E. *Grasses*, 3rd Edition, (Penguin Books, London)  
Wheeler, D.J.B., Jacobs, S.W.L. and Whalley, R.D.B., *Grasses of New South Wales*, 3rd. Edition, (University of New England Printery, Armidale)  
Reference book: Briggs, D. and Walters, S.M. *Plant Variation and Evolution*, 3rd Edition (Cambridge University Press, Cambridge).

#### AFNR5604

##### Diagnostic Methods in Turf Management

**Credit points:** 6 **Teacher/Coordinator:** Dr Peter Martin **Session:** Semester 1 **Classes:** External studies and residential block **Assessment:** One 3hr examination, one 2,000 word assignment, tutorial papers and a laboratory book.

Following an overview of the main chemical, physical and biological diagnostic tests used in the formulation of advice by turf consultants and in decision making by turf managers, the course will cover the theory and practice of sampling and of the conduct of tests (including interpretation guidelines) using selected methods in the three areas. Chemical testing will include the more important diagnostic methods for soils, irrigation and effluent waters and tissues; physical testing will cover particle size analysis, bulk density, pore space, moisture characteristic and infiltration rates for gravels, sands and soils used in turf construction; biological testing will cover the techniques used for the identification of the major pests and diseases of turf grasses. The unit includes an extensive laboratory component. Reference will also be made to quality assurance procedures in sampling and laboratory practice and the importance of statistical procedures in the interpretation of results.

##### Textbooks

Rayment, G.E. and Higginson, F.R. *Australian Laboratory Handbook of Soil and Water Chemical Methods* (Inkata Press, Adelaide).  
Peverill, K.I. et al., *Soil Analysis: an Interpretation Manual* (CSIRO publishing, Collingwood)  
Smiley, R.W., Dernoeden, P.H. and Clarke, B.B. *Compendium of Turfgrass Diseases*, 2nd Edition, (APS Press, St Paul).

#### AFNR5605

##### Applied Plant Ecology

**Credit points:** 6 **Teacher/Coordinator:** Dr Peter Martin **Session:** Semester 2 **Classes:** External studies and residential block **Prerequisites:** AFNR5601 or equivalent AFNR foundation unit of study **Assumed knowledge:** Practical awareness of pesticide use in the amenity horticulture industries. Basic chemistry, basic biology. **Assessment:** One 3hr exam, one 2,000 word assignment, one oral presentation, tutorial papers and practical reports.

Intended primarily for students in the amenity horticulture field, this unit explores the effects of the management practices used in the industry on the micro- and macro- environments, both biological and

physical. Input factors such as water, nutrients, organic amendments and pesticides will be considered in relation to their modes of action and their effects on soil sustainability (including acidification and salinification), macro- and micro-biodiversity, contamination of runoff water and ground water, and safety for staff and members of the community. Issues such as the use of selective versus broad-spectrum pesticides, the development of resistance to pesticides and enhanced bio-degradation of pesticides will be considered from the ecological perspective. Physical management methods such as scarification and coring in turf management and canopy reduction in tree management will be evaluated in terms of the net ecological benefits of the practices. During the semester each student will be required to choose a topic in consultation with the lecturer and subsequently present a seminar to the class in the form of a case study or situation analysis.

#### Textbooks

Atwell, B., Kriedemann, P and Turnbull, C. *Plants in Action: adaptation in nature, performance in cultivation.* (Macmillan, Melbourne) (selected chapters)  
 Gibson, D.J. *Methods in Comparative Plant Population Ecology.* (Oxford University Press, Oxford).  
 Coleman, D.C. and Crossley, D.A. *Fundamentals of Soil Ecology* (Academic Press, London)  
 Smith, L.W. *Notes on the Ecology of Weed Management* (Plant Breeding Institute, Camden).

#### AFNR5901

##### Research Review

**Credit points:** 6 **Teacher/Coordinator:** Dr Damien Field **Session:** Semester 1 **Classes:** No scheduled classes **Corequisites:** AFNR5905 **Assessment:** Written Research Review

This aims to develop a student's ability to review the literature with the view of developing a major research project in an area of specialization. The student will work with an academic advisor on a mutually agreed topic for research to be undertaken and the subsequent writing of a literature review. The literature review will advance the student's ability to identify existing knowledge, define research problems, demonstrate a sound grasp for presenting a research question, and begin to define a research strategy. Students will develop their research and inquiry skills through sourcing a wide range of literature and improve their written communication skills.

#### AFNR5904

##### Research Proposal and Approach

**Credit points:** 6 **Teacher/Coordinator:** Dr Damien Field **Session:** Semester 1 **Assessment:** Written Research Proposal & Oral Presentation

This unit of study aims to develop a student's ability to write a detailed research proposal and develop a strategy combined with the appropriate methodology to execute their research. Working with their academic advisor students will prepare a proposal describing; the background and aims, its significance and innovation, the justification of the methodology, the national benefit, and considerations of the required budget and project timeline. This unit will enable students to develop their ability to define a research project to be managed within a suitable research framework. Students will develop their skills in solving research problems and enhance their intellectual and personal autonomy through managing a research program.

#### AFNR5905

##### Research Paper

**Credit points:** 6 **Teacher/Coordinator:** Dr Damien Field **Session:** Semester 2 **Corequisites:** AFNR5901 **Assessment:** Written Research Paper

This unit of study builds on the major research project proposed in AFNR5904. Working with their academic advisor students will execute their research strategy that provides data and subsequent data analysis towards solving the research question. The results and analysis will be presented in a format suitable for submission as a research paper to a relevant journal. Students will build their research skills, develop a strong analytical capacity, demonstrate a sound grasp of the topic, and ability to interpret results in a broad framework. Students will demonstrate their ability to draw reliable conclusions and identify future areas of research. Students will continue to develop their skills in solving research problems and enhance their intellectual

and personal autonomy by means of managing a research program. Students will improve their communication skills through presentation of the research paper.

#### AFNR5906

##### Research Communication

**Credit points:** 6 **Teacher/Coordinator:** Dr Damien Field **Session:** Semester 2 **Assessment:** Written Popular Article, Poster Presentation & Oral Presentation

This unit of study provides the students with the opportunity to present the research findings of their major research project using several communication media appropriate for different audiences, for example, external stakeholders and /or popular media. Using poster and oral presentations students will communicate their research to the academic community in a professional conference environment. Students will also be required to attend the Faculty's seminar program that is relevant to their research topic. Students will build on their skills to use several modes of communication to demonstrate their ability to produce high quality results, draw reliable conclusions and identify future areas of research.

#### AGEC5300

##### Business Topics in Amenity Horticulture

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** Dr Michael Harris **Session:** Semester 1 **Classes:** Intensive course 26 lectures plus supporting workshops **Assessment:** 2 hr examination; 2 assignments.

This unit is focussed on managerial economics of profit and non-profit organisations involved in providing turf-related, and more generally horticulture-based, products and services, such as active and passive recreation and amenity services. Market priced and non-priced goods and services are considered. Topics may include accounting concepts, budgeting, financial planning and control, capital management, resource management, demand assessment, marketing and pricing strategies, environmental externalities and other market failures, regulation and other forms of government intervention, and non-market valuation.

#### AGEC5301

##### Agribusiness Management

**Credit points:** 6 **Teacher/Coordinator:** Ms. Lynn Henry **Session:** Semester 2 **Classes:** (3 lec & 2 workshop)/wk **Assessment:** One mid semester exam (1 hour) one final exam (2hr), assignments.

This unit of study deals with the application of economic principles and techniques of business management to agribusiness firms, with a particular focus on farms. The topics covered will include: management goals and objectives; budgeting; gross margins analysis; parametric budgeting; sources of management information and its analysis; simple systems simulation; applications of linear programming to farm and agribusiness planning; financial management; risk in planning and management; cash, credit, debt and taxation management; evaluation of investment and firm growth alternatives; acquisition and transfer of assets; the role of financial institutions in the agricultural credit market. Students develop skills in computer-based farm planning.

While the unit covers material dealt with at the third year level, additional workshops, seminars, tutorials, assignments and/or assessment will be provided as appropriate to the postgraduate program.

#### Textbooks

J.B. Hardaker et al. *Coping with Risk in Agriculture*, 2nd edn (CABI, 2004).

#### AGEC5302

##### Agricultural and Resource Policy

*This unit of study is not available in 2010*

**Credit points:** 6 **Session:** Semester 1 **Classes:** (2-3 lec, 1x1 hour tutorial)/week **Assessment:** One mid semester exam (1 hour); one final exam (2 hours); assignments; tutorial papers.

This unit is designed to cover basic theoretical and modelling frameworks for economic evaluation of policy formation (including

Pareto welfare economics and public choice theory); market and government failure; the institutional structure of agricultural and resource policy formulation in Australia; micro and macroeconomic issues in agricultural and resource policy; and issues arising from linkages between agriculture and the resource industries and with the rest of the economy. Students will be expected to read widely.

While the unit covers material dealt with at the third year level, additional workshops, seminars, tutorials, assignments and/or assessment will be provided as appropriate to the postgraduate program.

### AGEC5303

#### Applied Optimisation

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Ross Drynan **Session:** Semester 1 **Classes:** (2 lec and 2 tut)/wk **Assessment:** One end-of-semester exam (2 hours), assignments, class work.

This unit of study deals with constrained optimization problems in which one or more constraints are inequalities. Such problems are explored/solved by "mathematical programming" techniques. The main focus of the unit is on linear programming (LP) problems, i.e. ones in which both the objective and the constraints are linear functions, and its application in agricultural and other planning contexts. Topics include graphical and mathematical representation of LP problems, solution methods, solution information, stability of optimal solutions, primal and dual formulations and parametric programming. After covering the basics of LP, the focus shifts to modelling real world scenarios as optimization problems. Students are streamed: one group deals with specialized LP formulations (e.g. transportation model) and extensions of LP (e.g. integer programming). The other examines dynamic optimization for problems that involve inter-temporal resource allocation. Students develop experience and confidence in the use of spreadsheet-based optimizer routines, and with specialised optimization packages (e.g. LINDO).

### AGEC5304

#### Research Methods

**Credit points:** 6 **Teacher/Coordinator:** Ms Elizabeth Nolan **Session:** Semester 2 **Classes:** (2 lec, 1-2 hour tut)/week **Assessment:** One mid semester exam (1 hour), one final exam (2 hours), assignments, research proposal.

This unit deals with the nature of research and inquiry in applied economics. Topics covered will include: alternative philosophical perspectives on inquiry; scientific method; inductive thought and deductive logic; creativity; research as an orderly process of enquiry; preparation of research proposals; secondary data sources for agricultural and resource economists; collection of primary data; statistical design of sample surveys; questionnaire construction; interviewing techniques; and methods of analysis of survey data. Topics are illustrated with examples of research in theoretical economics, empirical discipline-advancing research, empirical exploratory research, and research using policy-evaluation modelling. Students are expected to read widely.

While the unit covers material dealt with at the third year level, additional workshops, seminars, tutorials, assignments and/or assessment will be provided as appropriate to the postgraduate program.

### AGEC5401

#### Agricultural Marketing Analysis

*This unit of study is not available in 2010*

**Credit points:** 6 **Session:** Semester 2 **Classes:** (2-3 lec, 1x1 hour tut)/wk **Assessment:** One mid semester exam (1 hour) one final exam (2 hours), case studies.

Performance of the agricultural and resource marketing systems, marketing margins, transportation, storage, advertising, wholesaling, and retailing. The structure, conduct and performance of marketing firms, and government and public interest in the food system will also be addressed via a number of case studies. Extensive readings will be required. The unit is designed to focus on analysing applied

strategic management problems facing marketing firms. Students will be required to read widely.

*Textbooks*

Collections of readings

### AGEC5402

#### Agricultural Development Economics

**Credit points:** 6 **Teacher/Coordinator:** Dr Paulo Santos **Session:** Semester 2 **Classes:** (2-3 lec, 1x1 hour tut)/wk **Assessment:** One mid semester exam (1 hour) one final exam (2 hours), case studies.

This unit focuses on the microeconomic analysis of development, with a special emphasis on the importance of market failures in financial markets as origin of persistent poverty. The unit also addresses policy interventions to overcome such failures and the challenges in their evaluation. A special emphasis is put in the discussion of the role of agriculture in development, and the evidence supporting its importance in poverty reduction.

*Textbooks*

Debraj Ray, Development Economics, Princeton University Press.

Abhijit Banerjee, Roland Bénabou and Dilip Mookherjee, Understanding Poverty, Oxford University Press.

World Bank, Agriculture for Development - World Development Report 2008, World Bank and Oxford University Press

N.B. Students are advised not to buy the textbooks before lectures commence in case there are any changes.

### AGEC5403

#### Agricultural Trade

*This unit of study is not available in 2010*

**Credit points:** 6 **Session:** Semester 1 **Classes:** (2-3 lec, 1x1 hour tut)/wk **Assessment:** One mid semester exam (1 hour) one final exam (2 hours), case studies.

In this unit of study the basic economic principles underlying international trade in agricultural and resource commodities and the policies involved will be presented. Issues related to trade and development will also be considered. The main topics covered will include: trends in agricultural and resources trade; economics and politics of protection, economic integration and impacts on international commodity trade; international trade policy making. An understanding of globalisation, including foreign direct investment, will also be required. Extensive reading will be required.

*Textbooks*

Collections of readings.

### AGEC5404

#### Agribusiness Analysis

**Credit points:** 6 **Teacher/Coordinator:** Dr Shyamal Chowdhury **Session:** Semester 1 **Classes:** (2-3 lec, 1x1 hour tut)/wk **Assessment:** One mid semester exam (1 hour) one final exam (2 hours), case studies.

This unit focuses on applications of economic theory and methods in agribusiness decision making. It provides advanced treatment of the industrial organisation of agribusiness firms. Case studies will be used to examine the economic complexities of global agribusiness systems. Extensive readings make up the central component of the unit.

*Textbooks*

Collections of readings.

### AGEC5405

#### Quantitative Planning Methods

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Ross Drynan **Session:** Semester 1 **Classes:** (2 lec & 2 tut/lab session)/wk **Assessment:** One end-of-semester exam (2 hours), 2 assignments.

*Note: Department permission required for enrolment.*

This unit examines the use of mathematical methods and models in planning at both the individual firm level and the sectoral level. While the principal focus is on formal optimization, simulation and Monte Carlo methods are briefly discussed. Topics include non-linear programming, elements of input-output analysis, computable general equilibrium analysis, dynamic problems and methods (eg. dynamic programming and optimal control). Sectoral level planning applications considered include transportation and plant location studies; spatial



equilibrium; and resource utilization across time. Firm level applications include multi-period planning, queuing problems, inventory analysis, and replacement problems. Extensive use is made of computer-based optimization.

The unit includes material dealt with at the advanced undergraduate level. Additional workshops, seminars, tutorials, assignments and/or assessment are provided as appropriate to the postgraduate program.

#### AGEC5406

##### Agricultural Finance and Risk

*This unit of study is not available in 2010*

**Credit points:** 6 **Teacher/Coordinator:** A/Prof Ross Drynan **Session:** Semester 2 **Classes:** (2 lec & 2 tut/lab session)/wk **Assessment:** One end-of-semester exam (2 hours), 2 assignments.

This unit has two related components. One component concerns risk and risk management in agriculture; the other deals with issues of agricultural producer finance. Risk topics include: risk measurement, subjective probability, adjusting beliefs as a result of new information; risk attitudes; decision making under risk; expected utility theory; valuing information; generalizations of expected utility theory; E-V analysis; stochastic dominance; internal measures to cope with risk including diversification and flexibility; insurance, futures, options and other market instruments for managing risk. Finance topics include the implications of capital market imperfections and consequential differences between corporate and small business finance; financial relationships between debt/equity levels and risk, optimal debt levels; cost of capital; short term working capital management; and longer term capital (investment) budgeting. Techniques of valuation of projects in risk-free and risk situations are examined. Financial and risk management practices in Australian agriculture are reviewed.

The unit includes material dealt with at the advanced undergraduate level. Additional workshops, seminars, tutorials, assignments and/or assessment are provided as appropriate to the postgraduate program.

#### AGEC5407

##### Professional Skills

*This unit of study is not available in 2010*

**Credit points:** 3 **Teacher/Coordinator:** A/Prof Fredoun Ahmadi-Esfahani **Session:** Semester 1 **Classes:** One 2 hour seminar/week **Assessment:** Discussion papers, 1x2 hour exam, essay.

*Note: Department permission required for enrolment.*

A series of lectures, seminars and workshops designed to provide students with enhanced professional skills. Sessions will focus on communication skills, including report writing, preparation of policy briefs, seminar and workshop presentations. Other sessions will be focused on aspects of professional ethics, attitudes and responsibilities and leadership. Participatory activities such as team debates and mock inquiry hearings addressing issues of current relevance to agricultural /resource economists are used to develop the student's communication skills and knowledge of issues.

#### AGEC5408

##### Contemporary Issues

*This unit of study is not available in 2010*

**Credit points:** 3 **Teacher/Coordinator:** Dr Michael Harris **Session:** Semester 2 **Classes:** One 2 hour seminar/week **Assessment:** 1x2hour final exam, 1xgroup presentation, 1x assignment.

Through regular seminars by guest speakers and occasional workshops or other participatory activities, students examine a broad range of national and international issues of current relevance to Australian agricultural and resource economists.

#### RSEC5431

##### Benefit Cost Analysis

**Credit points:** 6 **Teacher/Coordinator:** Dr Michael Harris **Session:** Semester 1 **Classes:** (2 lec, 1 tut)/wk **Assessment:** 20% written essay, 20% mid semester exam, 60% final exam

This unit provides a detailed treatment of benefit-cost analysis and its use in public sector decision making and project evaluation. The

underpinning concepts in welfare economics are analysed in detail, such as economic efficiency, criteria for assessing social welfare improvements, and economic surplus measures. Procedures of undertaking a benefit-cost analysis are presented, and tools of non-market valuation for environmental assets are covered in detail. These techniques include both stated and revealed preference techniques, including contingent valuation, choice modeling, hedonic pricing and travel cost methods.

#### RSEC5432

##### Environmental Economics

**Credit points:** 6 **Teacher/Coordinator:** Dr Tihomir Ancew **Session:** Semester 1 **Classes:** (2 lec, 1 tut)/wk **Assessment:** One 1hr midterm exam, practical report, one 2 hr end of semester exam.

The course provides theoretical and empirical background necessary for a resource economist to be able to successfully function when faced with various environmental problems. The unit investigates economic aspects of a range of environmental issues. The studied concepts are exemplified with environmental problems related to agriculture (soil salinity, algal blooms, overgrazing etc.) as well as with environmental problems typical to Australia. The guiding economic themes are: competing uses of the environment / externalities, market failure, the importance of property rights, optimal allocation of pollution abatement, technical issues in non-market valuation methods (measuring benefits without commodities), and the processes for making choices relating to non-market goods. Some social issues with environmental impacts are studied through exploration of the problems of population size and distribution, economic growth, and environmental regulation.

##### Textbooks

Perman, R., Y. Ma, J. McGilvray and M. Common. Natural Resource and Environmental Economics. Pearson, 3rd Ed. 2003

Charles D. Kolstad., Environmental Economics., Oxford University Press, 2000  
Tom Tietenberg., Environmental and Natural Resource Economics., 6th Edition, Addison-Wesley, 2003.

Grafton, Adamowicz, Dupont, Nelson, Hill and Renzetti. The Economics of the Environment and Natural Resources. Blackwell Publishing, 2004

N.B. Students are advised not to buy the textbook before lectures commence in case there are any changes.

#### RSEC5433

##### Economics of Mineral & Energy Industries

**Credit points:** 6 **Teacher/Coordinator:** Dr Tihomir Ancew **Session:** Semester 2 **Classes:** (2 lec, 1 tut)/wk **Assessment:** One 1 hr midterm exam, written report on field trip activities, one 2 hr end of semester exam.

The unit provides theoretical and empirical background in the economics of minerals exploration, extraction and marketing and in the economics of energy generation, distribution and use. The economics of the minerals and energy commodity markets will be discussed and analyzed. The interactions of mineral extraction and energy generation activities with other natural resources and the environment will be of particular interest (e.g. mine site remediation, land use conflicts). Sustainability and prospects for long term efficient use of these resources, as well as the development and use of alternative technologies will also be discussed. In addition, institutional and policy issues (e.g. regulatory reform), will be analyzed. The unit will discuss the main aspects of the markets for minerals and energy, market structure, business environment and price movements. The unit will also provide an introductory discussion on the markets for derivatives (options, futures, forward, swaps) on minerals and energy commodities.

##### Textbooks

T. J. Brennan, L. K. Palmer, and A. S. Martinez, Alternating Currents: Electricity Markets and Public Policy, Resources for the Future Press, Washington D.C., 2002.

J. E. Tilton, On Borrowed Time? Assessing the Threat of Mineral Depletion, Resources for the Future Press, Washington D.C., 2003.

R. Perman, Y. Ma, J. McGilvray and M. Common. Natural Resource and Environmental Economics. Pearson, 3rd Ed. 2003.

T. Tietenberg., Environmental and Natural Resource Economics., 6th Edition, Addison-Wesley, 2003.

F. E. Banks., Energy Economics: A Modern Introduction., Kluwer Academic Publishers, 2000.

S. Kesler., Mineral Resources, Economics and the Environment, Maxwell Macmillan International, 1994. N.B. Students are advised not to buy the textbook before lectures commence in case there are any changes.

#### **RSEC5434**

##### **Economics of Water and Bio-resources**

*This unit of study is not available in 2010*

**Credit points:** 6 **Session:** Semester 2 **Classes:** (2 lec, 1 tut)/wk **Assessment:** 1hr midterm exam, an essay paper, 2 hr end of semester exam.

The main objective of the economics of biological resources will be to introduce students to the bio-economic modeling of the resources that experience biological growth. The unit consists of two complementary parts: water economics and economics of biological resources (fisheries, forestry, other wildlife). The main objective of the water economic component is to investigate the economic aspects of water use and water quality. In particular approaches toward efficient use of the water resource over time, optimal allocation of water among competing uses and achievement of the socially optimal level of water quality will be discussed. The demand for water from various sectors will be analysed in both static and dynamic settings. Issues considered include the selection and construction of water storages, aquifer water extraction and alternative water sources. The issues of waste water disposal and water quality, changing water technologies, and water pollution will be also discussed. The unit will also discuss the economics of wildlife preservation and protection, as well as the economics of biodiversity. Particular attention will be devoted to the economic mechanisms for managing the water resources including property rights, water allocation and water markets. The key policy instruments (taxes, quotas, standards) in these areas are analyzed and discussed. The institutional and policy aspects will also be considered through analysis of water policy reform in Australia and elsewhere.

##### *Textbooks*

Bergstrom, Boule and Poe (Eds.), The Economic Value of Water Quality, Edward Elgar Pub., 2001.

Easter, Rosegrant and Dinar (Eds.), Markets for Water: Potential and Performance, Kluwer Academic Pub., 1998.

D. Smith, Water in Australia, Oxford University Press, 1999.

R. Perman, Y. Ma, J. McGilvray and M. Common. Natural Resource and Environmental Economics. Pearson, 3rd Ed. 2003.

J. M. Hartwick and Nancy D. Olewiler., The Economics of Natural Resource Use., 2nd Ed. , Addison-Wesley, 1998.

J. M. Conrad, (1999), Resource Economics, Cambridge University Press, Cambridge.

N.B. Students are advised not to buy the textbook before lectures commence in case there are any changes.

# 10. Postgraduate degree resolutions and policies

## Resolutions of the faculty

### Graduate Certificate, Graduate Diploma and Master of Agriculture

- 1.1 Graduate Certificate, Graduate Diploma and Master of Agriculture candidates will proceed by coursework.
- 1.2 Students may undertake part-time candidature.
- 1.3 Students may commence candidature in either first or second semester subject to the candidate being able to meet the requirements for the degree as described in Clause 4 of these resolutions.
2. **Admission requirements**
  - 2.1 Admission requirements for the Graduate Certificate, Graduate Diploma and Master of Agriculture are normally a bachelor's degree or an equivalent qualification.
  - 2.2 In some instances the admission requirements may be met by evidence of general or professional qualifications and appropriate work experience to indicate that the student has the academic preparation and capacity to complete the course in question.
  - 2.3 With the approval of the Dean, students may be granted admission with advanced standing if they have completed relevant prior learning at an equivalent level elsewhere.
3. **Periods of candidature**
  - 3.1 The period of candidature for a full-time candidate for the Graduate Certificate will be one semester.
  - 3.2 The period of candidature for a full-time candidate for the Graduate Diploma will be one year.
  - 3.3 The Master of Agriculture will normally take three semesters (18 months) of full time study to complete, but may be completed in two semesters with Faculty approval.
4. **Coursework to be completed**
  - 4.1 Candidates for the Graduate Certificate complete a total of 24 credit points made up from a selection of units specified in the units of study Tables listed in the Postgraduate Course Requirements chapter of the Faculty Handbook.
    - 4.1.1 Students who have completed relevant prior learning at an equivalent level may be given up to 6 credit points advanced standing with the approval of the Dean.
  - 4.2 Candidates for the Graduate Diploma complete a total of 36 credit points made up of electing units as specified in Tables listed in the Postgraduate Course Requirements chapter of the Faculty Handbook (subject to meeting prior learning requirements and timetabling).
    - 4.2.1 Students who have completed relevant prior learning at an equivalent level may be given up to 12 credit points advanced standing with the approval of the Dean.
  - 4.3 Candidates for the Master of Agriculture complete a total of 48 credit points made up of a research project equating to 24 credit points and the balance from electing units as specified in units of study in Tables listed in the Postgraduate Course Requirements chapter of the Faculty Handbook (subject to meeting prior learning requirements and timetabling) or with the Dean's approval, two appropriate credit point units offered from outside the Faculty. All research projects will commence in Semester 1 unless exemption is approved by the Dean.
    - 4.3.1 Students who have completed relevant prior learning at an equivalent level may be given up to 12 credit points advanced standing with the approval of the Dean.
  - 4.4 The specified requirements (excluding total credit points) for the completion of degrees maybe reviewed by the Faculty on a case-by-case basis, based on academic grounds. Any recommended changes arising must be approved by the Dean.
  - 4.5 Advanced standing is given only when:
    - 4.5.1 no unit of study for which credit is granted has been a basis for the award of any other degree or diploma;
    - 4.5.2 the unit or units were passed at a level of competence or with such additional assessment or other requirements as may be determined by the Board in each case;
    - 4.5.3 the unit or units were completed within six years immediately preceding the commencement of candidature for the Master of Agriculture, the Graduate Diploma or the Graduate Certificate.
  - 4.6 Students may transfer between programs and receive credit for any completed units, provided they have not taken out the award from which they are transferring.
    - 4.6.1 To achieve the objectives of the courses, especially for students seeking training in a new discipline, some classes may be taught in conjunction with advanced undergraduate units.
    - 4.6.2 However, postgraduate coursework students will engage in additional consultation and more advanced assignment work than their undergraduate counterparts.
    - 4.6.3 They will also be assessed against a higher standard.
5. **Subject Areas**
  - 5.1 The Graduate Certificate, Graduate Diploma and Master of Agriculture may be awarded in Faculty defined subject areas.
6. **Satisfactory progress**
  - 6.1 The Faculty requires students to demonstrate satisfactory progress with their studies.
  - 6.2 A student may be deemed not to have made satisfactory progress in any semester if the student:
    - 6.2.1 fails to complete at least half the credit point he/she is enrolled; or
    - 6.2.2 obtains a WAM of less than 50 based on units of study for a given semester; or
    - 6.2.3 fails a unit of study for the second time; or
    - 6.2.4 has an unsatisfactory attendance record; or
    - 6.2.5 is unable to complete the degree in the maximum time.
  - 6.3 A student who fails to demonstrate satisfactory progress in any semester of enrolment may become subject to the relevant Academic Board policy on progression.
  - 6.4 In accordance with the relevant University and Faculty policies, a student who has repeatedly failed to demonstrate satisfactory progress may be called upon to show good cause why he or she should be allowed to re-enrol in the degree course.
  - 6.5 Where a student fails to show good cause why he or she should be allowed to re-enrol, the Dean may exclude the student from re-enrolment in the degree.
7. **Withdrawal from units of study**
  - 7.1 A candidate for a Graduate Certificate, Graduate Diploma or Master of Agriculture who discontinues enrolment in a Semester 1 unit of study on or before 31 March in that year, will be recorded as withdrawn from that unit.
  - 7.2 A candidate for a Graduate Certificate, Graduate Diploma or Master of Agriculture who discontinues enrolment in a Semester 2 unit of study on or before 31 August in that year, will be recorded as withdrawn from that unit.
8. **Discontinuation**
  - 8.1 A candidate for a Graduate Certificate, Graduate Diploma or Master of Agriculture who discontinues enrolment in a unit of study after the withdrawal period but before the end of classes in that unit, will be recorded as 'Discontinued - Not to count as failure' in that unit.
9. **Completion of course**
  - 9.1 Except by permission of the Dean, no student will be allowed to sit for any examination unless the requirements specified by the Faculty have been completed.
  - 9.2 The Dean may call upon any student who has been absent from more than 10 per cent of classes in any semester to show cause for such absence.
  - 9.3 Students who fail to show sufficient cause may be excluded from admission to examinations. No excuse for absence from lectures, demonstration or practical work will be received unless



tendered in writing to the Faculty Office within one week after attendance is resumed.

#### 10. Authority

- 10.1 In accordance with Senate Resolutions, the Board of Postgraduate Studies exercises the Faculty's powers and functions in regard to Faculty's management of each higher degree candidature.
- 10.2 The Board of Postgraduate Studies may authorise the Associate Dean (Postgraduate Studies) to take executive action on behalf of the Board when, in his or her opinion, timely action is necessary and unlikely to be contentious in discussion by the Board, with such actions taken and relevant documents to be reported and tabled at the next meeting of the Board of Postgraduate Studies for consideration and formal approval. Allowable actions include approval of:
  - 10.2.1 admission to candidature
  - 10.2.2 suspension of candidature
  - 10.2.3 variations of requirements for candidature
  - 10.2.4 award of the Graduate Certificate, Graduate Diploma and Master of Agriculture.

### Master of Science in Agriculture, Master of Agricultural Economics and Doctor of Philosophy

These resolutions should be read in conjunction with The University of Sydney (Doctor of Philosophy (PhD)) Rule 2004 as outlined in The University of Sydney Calendar and the Resolutions of the Academic Board relating to the degree of Doctor of Philosophy.

#### 1. Candidature

- 1.1 A candidate for the degree of Master of Science in Agriculture, Master of Agricultural Economics or Doctor of Philosophy, will proceed by research and submission of a thesis.

#### 2. Admission requirements

- 2.1 An applicant for admission to candidature for a research degree will:
  - 2.1.1 hold a degree of Bachelor of the Faculty with First or Second Class Honours or equivalent of the University of Sydney; or for the Master of Agricultural Economics or Master of Science in Agriculture, hold a degree of Bachelor of the Faculty with a credit grade or above in the fourth year in the field in which the candidate is proceeding; or
  - 2.1.3 have completed courses in another faculty or institution, these courses being deemed by the Faculty to be equivalent.
- 2.2 Demonstrated research ability will be considered when determining eligibility; applicants proposing to proceed primarily by research and thesis should provide evidence such as publications in scientific journals.
- 2.3 A research topic, which is satisfactory in terms of research interests, resources and availability of supervision within the discipline, must be agreed upon between the applicant and the supervisor.
- 2.4.1 The Faculty will require a person admitted as a candidate for the degree of Master of Science in Agriculture, Master of Agricultural Economics or Doctor of Philosophy to serve a period of probation for not more than two semesters and to complete such work during the period as it may prescribe, and at the completion of the period, the Faculty will review the candidature and the work completed, and may confirm or terminate the candidature.
- 2.4.2 If the Faculty confirms the candidature, it will be deemed to have commenced at the beginning of the period of probation.
- 2.5.1 Applicants may be required to provide evidence of adequate financial resources for personal support and compulsory fees during candidature.
- 2.5.2 They may be required to demonstrate to the satisfaction of the Faculty a proficiency in the English language adequate to undertake the proposed candidature.

#### 3. Availability

- 3.1 The number of students admitted may be limited and will be determined by:
  - 3.1.1 availability of resources, including space, library, equipment and computing facilities, and
  - 3.1.2 availability of adequate and appropriate supervision.
- 3.2 In considering an application for admission to candidature the Faculty will take account of resource limitations and will select in preference applicants who are most meritorious in terms of section 2 above.

#### 4. Periods of candidature

- 4.1 The minimum period of candidature for a full-time candidate for the degree of Master of Science in Agriculture or the degree of Master of Agricultural Economics will be four semesters, except in the case of a candidate who holds the degree of Bachelor of the Faculty with first- or second-class Honours or another qualification accepted by the Faculty as equivalent, for whom the minimum period will be two semesters.
- 4.2 The maximum period of full-time candidature for the Master of Science in Agriculture or the Master of Agricultural Economics will be six semesters, but the Faculty may, in special circumstances, extend a candidature.
- 4.3 The minimum period of candidature for a full-time candidate for the degree of Doctor of Philosophy will usually be six semesters.
- 4.4 The Faculty will determine the minimum and maximum periods of candidature for part-time candidates on a pro-rata basis.
- 4.5 The Faculty may deem time spent or work done for another research degree of The University of Sydney to be time spent or work done for the degree of Master of Science in Agriculture or the degree of Master of Agricultural Economics if the candidate has ceased to be a candidate for the other degree, and the Faculty may reduce the minimum and maximum periods of candidature accordingly.

#### 5. Part-time candidature

- 5.1 The Faculty may permit candidates to enrol in part-time candidature provided they supply a satisfactorily detailed plan of their proposed program and attend at the University for such consultation with the supervisor and participate in such faculty activities as are required by the Associate Dean (Postgraduate).
- 5.2 The Faculty may permit part-time candidates for the Master of Agricultural Economics, Master of Science in Agriculture or Doctor of Philosophy admitted under the provisions of chapter 10 of the by-laws to complete the investigation elsewhere, after four semesters have been spent in this or equivalent candidature within the University.
- 5.3 Candidates admitted to part-time candidature are expected to devote a minimum of 20 hours per week (or equivalent) to their candidature.
- 5.4 Research assistants or associate lecturers in the University will enrol part-time unless they can demonstrate to the satisfaction of the Faculty that they have sufficient time to pursue full-time candidature.

#### 6. Control of candidature

- 6.1 Each candidate for the Master of Agricultural Economics, Master of Science in Agriculture or Doctor of Philosophy will pursue his or her course of advanced study and research wholly under the control of the Faculty.
- 6.2 Where a candidate is employed by an institution other than the University, the Faculty may require a statement by that employer acknowledging that the candidature will be under the control of the Faculty.

#### 7. Appointment of supervisor

- 7.1 The Faculty will appoint a member of the full-time academic or research staff of the Discipline in which a candidate for the Master of Agricultural Economics, Master of Science in Agriculture or Doctor of Philosophy is proceeding to be the candidate's supervisor.
- 7.2 The Faculty will also appoint one or more associate supervisor/s of the candidate who may be a member of the academic or research staff of the University, an Honorary Research Associate, or a person with appropriate qualifications in another institution or organisation.

#### 8. Progress

- 8.1 Each candidate will report regularly to the Faculty on his or her progress towards completing the requirements for the degree.
- 8.2 The Faculty will consider the report of each candidate and may, if it considers that a candidate has not made satisfactory progress towards completing the requirements for the degree, terminate the candidature.

#### 9. Discontinuation of enrolment and readmission after discontinuation

- 9.1 A Master of Agricultural Economics, Master of Science in Agriculture or Doctor of Philosophy candidate will be presumed to have discontinued enrolment in a unit of study or the degree from the date of application to the Faculty unless evidence is produced

- 9.1.1 that the discontinuation occurred at an earlier date, and
- 9.1.2 that there was good reason why the application could not be made at the earlier time.
- 9.2 A candidate who discontinues enrolment in a unit of study or degree before 31 March or 31 August will be recorded as having withdrawn from that unit or degree.
- 9.3 A candidate who discontinues enrolment in a unit of study or degree after 31 March or 31 August will be recorded as 'Discontinued - Not to count as failure'.
- 9.4 A candidate who at any time discontinues enrolment from a degree will not be entitled to re-enrol in that degree unless the candidate is readmitted to candidature for that degree.
- 9.5 Subject to section 9.1, candidates may not discontinue enrolment in a unit of study after the end of classes in that unit, unless the degree regulations permit otherwise.
- 9.6 The Dean, Pro Dean or an Associate Dean of a Faculty may act on behalf of that Faculty in the administration of these resolutions.
- 10. Lodgement of thesis**
- 10.1.1 Not earlier than the end of the minimum period of candidature, each candidate proceeding by research and thesis will lodge with the Faculty copies of a thesis embodying the results of an original investigation carried out by the candidate.
- 10.1.2 Three copies of a thesis are required from Masters candidates and four copies from PhD candidates.
- 10.2 The candidate will state in the thesis, generally in a preface and specifically in notes, the sources from which the information was derived, the extent to which the candidate has made use of the work of others, and the portion of the thesis the candidate claims to be original.
- 10.3 The thesis will be accompanied by a certificate from the candidate's supervisor stating whether, in the supervisor's opinion, the form of presentation of the thesis is satisfactory.
- 10.4 A candidate must be enrolled at the time of submission of the thesis.
- 11. Form of a thesis**
- 11.1 A thesis may be bound for submission in either a temporary or a permanent form.
- 11.2 Temporary binding must be strong enough to withstand ordinary handling and postage. The preferred form of binding is the 'Perfect Binding' system; ring-back or spiral binding is not permitted.
- 11.3 The cover of a temporarily bound thesis must have a label with the candidate's name, name of the degree, the title of the thesis and the year of submission.
- 11.4 The requirements for permanent binding are set out in the Statutes and Regulations in the Academic Board's resolutions for binding of PhD theses.
- 11.5 Following examination, and emendation if necessary, at least one copy of a thesis (the Rare Book Library copy) must be bound in permanent form on archive paper.
- 11.6 If emendations are required, all copies of a thesis which are to remain available within the University must be amended.
- 12. Examination**
- 12.1 The Faculty will appoint three examiners for a PhD thesis, of whom at least two will be external to the University. An internal examiner need not be expected and the supervisor can not be an examiner.
- 12.2 The Faculty will generally appoint two examiners for a Masters thesis of whom at least one will be external to the University. The supervisor can not be an examiner.
- 13. Result of candidature**
- 13.1 The Board of Postgraduate Studies awards, or for the PhD degree the PhD Awards Sub Committee of the University's Research and Research Training Committee recommends the award of, the degree whenever:
- 13.1.1 the examiners have recommended without reservation that the degree be awarded and the Pro Dean concurs; or
- 13.1.2 all of the examiners have recommended that the degree be awarded or awarded subject to emendations to all copies of the thesis which are to remain available within the University and the Pro Dean concurs; or
- 13.1.3 the Board of Postgraduate Studies unanimously accepts a recommendation from the Discipline Leader to award or award subject to emendations despite reservations expressed by one or more of the examiners; or
- 13.2 The Board of Postgraduate Studies may permit an unsuccessful candidate to prepare for re-examination if, in its opinion, the candidate's work is of sufficient merit to warrant this concession and the Pro Dean has so recommended.
- 14. Authority**
- 14.1 In accordance with Senate Resolutions, the Board of Postgraduate Studies exercises the Faculty's powers and functions in regard to Faculty's management of each higher degree candidature.
- 14.2 The Board of Postgraduate Studies may authorise the Associate Dean (Postgraduate Studies) to take executive action on behalf of the Board when, in his or her opinion, timely action is necessary and unlikely to be contentious in discussion by the Board, with such actions taken and relevant documents to be reported and tabled at the next meeting of the Board of Postgraduate Studies for consideration and formal approval. Allowable actions include approval of:
- 14.2.1 award of the degree of Doctor of Philosophy under conditions approved by the University's Academic Board.
- 14.2.2 award of the Master of Science in Agriculture and Master of Agricultural Economics degrees.
- 14.2.3 nomination of examiners
- 14.2.4 admission to candidature
- 14.2.5 supervisory arrangements
- 14.2.6 variation of candidature
- 14.2.7 extension of candidature
- 14.2.8 completion of candidature away from the University
- 14.2.9 suspension of candidature
- 14.2.10 the award of Faculty scholarships, the Faculty Research Support Scheme(FRSS) and the Postgraduate Research Support Scheme(PRSS) monies.
- 14.2.11 continuance following receipt of annual progress reports.
- 15. Board of Postgraduate Studies**
- 15.1 Pursuant to the resolutions of Senate the Faculty appoints the following to the Board of Postgraduate Studies:
- 15.1.1 Dean
- 15.1.2 Pro Dean
- 15.1.3 Associate Dean (Postgraduate Studies)
- 15.1.4 Professors of the Faculty
- 15.1.5 Postgraduate Coordinators or their nominees

## Resolutions of the Senate

### Resolutions of the Senate - postgraduate courses

The resolutions for all coursework degrees, diplomas and certificates must be read in conjunction with the University of Sydney (Coursework) Rule 2000 (as amended), which sets out the requirements for all coursework courses, and with the relevant Faculty Resolutions.

1. The postgraduate degrees in the Faculty of Agriculture, Food and Natural Resources shall be:
  - 1.6 Master of Science in Agriculture (MScAgr)
  - 1.7 Master of Agricultural Economics (MAgrEc)
  - 1.8 Master of Agriculture (MAgr)
  - 1.9 APEC Master of Sustainable Development (APEC MSDevel)
  - 1.10 Doctor of Philosophy (PhD)
  - 1.11 Doctor of Science in Agriculture (DScAgr)
  - 1.12 Doctor of Agricultural Economics (DAgrEc)
2. The diplomas in the Faculty of Agriculture shall be:
  - 2.1 Graduate Diploma in Agriculture (GradDipAgr)
  - 2.2 Graduate Diploma in Agricultural Science (GradDipAgrSc)
  - 2.3 Graduate Diploma in Agricultural Economics (GradDipAgrEc)
  - 2.4 Graduate Certificate in Agriculture (GradCertAgr)



# 11. Postgraduate scholarships and prizes

On the recommendation of the faculty, the University of Sydney awards postgraduate scholarships to candidates proceeding by research and thesis to the degrees of Doctor of Philosophy, Master of Science in Agriculture and Master of Agricultural Economics. The terms and conditions for the Thomas Lawrence Pawlett Postgraduate Scholarship, the Christian Rowe Thornett Scholarship, the Alexander Hugh Thurburn Scholarship, the WC Turland Postgraduate Scholarship and the FH Loxton Studentship are listed below. They are normally

offered annually, when available, as soon as possible after the award of the Australian Postgraduate Awards upon which value the stipend is based.

## Summary of scholarships and prizes

The following table is a summary only; for full details concerning the conditions governing the awards of these prizes and scholarships contact the Research Office.

Scholarship	Value \$	Closing date	Other information
<b>Tenable at the University of Sydney</b>			
Australian Postgraduate Awards	22,500 in 2010	31 October	Graduates with Hons I. For research in any field.
University of Sydney Postgraduate Awards	as for APA	31 October	Graduates with Hons I. For research in any field.
Henry Bertie and Florence Mabel Gritton Postgraduate Research Scholarships	as for APA	January and July	For research in chemistry in relation to industry and agriculture.
Richard Claude Mankin Scholarship à Postgraduate	as for APA	January	For research into water conservation.
James Vincent Scholarship in Microbiology	up to 1000	31 March	APA or similar scholarship holders working in applied microbiology.
<b>Awards restricted to candidates in Agriculture</b>			
McCaughey Memorial Institute Scholarship	as for APA	as advertised	Graduates to conduct research in agricultural sciences with particular relevance to rice.
Norman Scott Noble Scholarship	up to 1000	mid-May	Travel grant or grant-in-aid to candidates in the discipline of agricultural entomology.
Irvine Armstrong Watson Scholarship	up to 500	mid-May	Travel grant or grant-in-aid to candidates in the disciplines of agricultural genetics, biometry, plant breeding or plant pathology.
<b>Faculty scholarships</b>			
The following five are identical (except that the FH Loxton is restricted to males) and are awarded annually depending on the availability of funds.			
Thomas Lawrence Pawlett Postgraduate Scholarship	as for APA	30 November	Graduates for full-time research within faculty (preference to Hons I or II Div. 1 or equivalent).
Christian Rowe Thornett Scholarship	as above	30 November	as above
Alexander Hugh Thurburn Scholarship	as above	30 November	as above
WC Turland Postgraduate Scholarship	as above	30 November	as above
FH Loxton Postgraduate Scholarship	as above	30 November	as above. Restricted to males.

## General terms and conditions

The scholarships are awarded under the following general terms and conditions:

1. The object of the scholarships shall be the encouragement and promotion of the scientific study of agriculture within the Faculty.
2. The scholarships shall be awarded by the Faculty of Agriculture, Food and Natural Resources, to University graduates, graduands or persons holding equivalent qualifications who are eligible for admission to candidature for a higher degree by research and thesis and who enrol as full-time candidates.
3. In awarding the scholarships, consideration shall be given to the work of the applicants during their undergraduate courses, their postgraduate careers, if any, and their special aptitude and ability to carry out the object of the scholarship.
4. The annual value of the scholarship shall be equal to the value of the Australian Postgraduate Awards and shall provide the same allowances as those awards
5. The maximum tenure of the scholarships shall be, in the case of a candidate:
  - 5.1 for the degree of Master, for up to two years, or
  - 5.2 for the degree of Doctor of Philosophy, for three years and in exceptional circumstances may be extended by up to six months.
6. The tenure of the scholarships may be, in the case of a candidate:
  - 6.1 who has been enrolled previously for a higher degree in the Faculty, reduced by the time credited towards the degree for which the candidate enrolls, or
  - 6.2 who is or has been enrolled for the same degree for which the scholarship is awarded, reduced by the time the candidate has been enrolled for that degree.
7. The scholar shall furnish progress reports to the Faculty annually at the end of the academic year and at other times if directed.
8. The scholar shall acknowledge the tenure of the scholarship in any thesis or other publication which shall result from such tenure.
9. No scholar shall, except with the approval of the Faculty, occupy any salaried position or hold any other award during the term of appointment. The scholar may undertake teaching assistance consistent with the University Postgraduate Research Award conditions.



## Specific terms of awards

The following specific terms and conditions of award apply to the postgraduate scholarships listed.

### Thomas Lawrance Pawlett Scholarships

Dr Thomas Lawrance Pawlett of Cremorne bequeathed the income from his residuary estate to the University for the purpose of encouraging and promoting the scientific study of agriculture in connection with the said University for the founding of a research or travelling scholarship or scholarships in agriculture, to be called the Thomas Lawrance Pawlett Scholarship.

There are three types of scholarship established under the foundation: the Thomas Lawrance Pawlett Postgraduate Scholarship, the Thomas Lawrance Pawlett Postdoctoral Scholarship and the Thomas Lawrance Pawlett Visiting Scholarship.

### Thomas Lawrance Pawlett Postgraduate Scholarship

The scholarship is awarded under the following specific condition:

1. The name of the scholarship shall be the Thomas Lawrance Pawlett Postgraduate Scholarship.

### Christian Rowe Thornett Scholarship

The scholarship was established in 1975 by a bequest from Mrs Christian Rowe Thornett for the teaching and development of agricultural science.

The scholarship is awarded under the following specific condition:

1. The name of the scholarship shall be the Christian Rowe Thornett Scholarship.

### Alexander Hugh Thurnburn Scholarship

In 1972 the Faculty of Agriculture received a bequest from Mary Esme Thurnburn, who established a scholarship in memory of her husband.

The scholarship is awarded under the following specific condition:

1. The name of the scholarship shall be the Alexander Hugh Thurnburn Scholarship.

### WC Turland Postgraduate Scholarship

The scholarship was established in 1976 by a bequest from WC Turland.

It is awarded under the following condition:

1. The name of the scholarship shall be the WC Turland Postgraduate Scholarship.

### FH Loxton Postgraduate Scholarship

Established in 1960 under the will of FH Loxton, who bequeathed a portion of the income of his residuary estate to the University for the purpose of establishing and maintaining studentships and or scholarships tenable in the Faculties of Veterinary Science, Agricultural Science and Engineering in particular in the Department of Chemical Engineering. These studentships and scholarships shall be awarded to male persons only by the Faculty of Veterinary Science, the Faculty of Agriculture, Food and Natural Resources or the Department of Chemical Engineering.

The scholarships shall be awarded in any of the following categories, at faculty discretion:

- Postgraduate Research Scholarships
- Postgraduate Supplementary Scholarships
- Postgraduate Short term Research/Thesis Completion Scholarships
- Undergraduate Scholarships
- Postdoctoral Fellowships

1. The name of the scholarships shall be the FH Loxton Postgraduate Studentships.
2. The scholarships are for postgraduate research and shall be awarded on the basis of academic merit.
3. The scholarships are of the annual value of an Australian Postgraduate Award (APA). A relocation allowance and a thesis allowance are payable in line with APA entitlements.
4. The scholarships are tenable for up to two years for a masters degree and up to three years for a PhD degree subject to satisfactory annual progress judged by the faculty concerned, or the Department in the case of Chemical Engineering. In exceptional circumstances, a further extension of six months may be granted to PhD candidates. Periods of study already undertaken towards the degree prior to the commencement of the award will be deducted from the maximum period of tenure.

### Norman Scott Noble Scholarship

Established in 1987 by a donation of \$14,000 by Mrs Mabel Noble in memory of her husband, Dr Norman Scott Noble, a distinguished graduate of the Faculty of Agriculture.

The scholarship is awarded under the following conditions:

1. The name of the scholarship shall be the Norman Scott Noble Scholarship.
2. The objects of the scholarship shall be to further studies in agricultural entomology and to encourage and promote the discipline at the University of Sydney.
3. The scholarship shall be awarded by the Faculty of Agriculture, Food and Natural Resources on the recommendation of the Dean, who shall act on the advice of the appropriate professors, associate professors, readers and the candidate's supervisor in recommending the award and in determining the value of the scholarship.
4. The scholarship may only be awarded to a candidate enrolled in the Faculty of Agriculture, Food and Natural Resources for a higher degree or a diploma in the discipline of agricultural entomology.
5. The scholarship may be held in conjunction with any other postgraduate award and may be in the form of a travel grant or a grant-in-aid for the holder for expenses incurred in connection with the holder's research.
6. More than one scholarship may be awarded in any one year if sufficient funds are available. The maximum amount available for the award of the scholarships in any year shall be \$1000.
7. A candidate may be awarded the scholarship more than once, provided that the total value of the awards to any one candidate does not exceed \$3000.

Applications for the scholarship shall be lodged at the Research Office by mid-May each year.

### Irvine Armstrong Watson Scholarship

The scholarship was established in 1987 by a donation of \$5000 by Mrs Loloma Watson and family in memory of their husband and father, Emeritus Professor Irvine Armstrong Watson.

The scholarship is awarded under the following conditions:

1. The name of the scholarship shall be the Irvine Armstrong Watson Scholarship.
2. The object of the scholarship shall be to further studies in the disciplines of agricultural genetics, biometry, plant breeding or plant pathology.
3. The scholarship shall be awarded by the Faculty of Agriculture, Food and Natural Resources on the recommendation of the Dean, who shall act on the advice of the appropriate professors, associate professors, readers and the candidate's supervisor in recommending the award and in determining the value of the scholarship.
4. The scholarship may only be awarded to a candidate enrolled in the Faculty of Agriculture, Food and Natural Resources for a higher degree or a diploma in one of the disciplines of agricultural genetics, biometry, plant breeding or plant pathology.
5. The scholarship may be held in conjunction with any other postgraduate award and may be in the form of a travel grant or a grant-in-aid for the holder for expenses incurred in connection with the holder's research.



6. More than one scholarship may be awarded in any one year if sufficient funds are available. The maximum amount available for the award of the scholarships in any year shall be \$500.
7. A candidate may be awarded the scholarship more than once, provided that the total value of the awards to any one candidate does not exceed \$1000.

Applications for the scholarship shall be lodged at the Research Office by mid-May each year.

## Awards not restricted to graduates in Agriculture

- Travelling scholarships
- Baillieu Research Scholarship\*
- HS Carslaw Memorial Scholarship
- William and Catherine McIlrath Scholarship
- The Rhodes Scholarship
- The Gowrie Postgraduate Research Scholarships
- The JB Watt Travelling Scholarship
- The James King of Irrawang Travelling Scholarship\*
- The Charles Gilbert Heydon Travelling Fellowship in Biological Sciences
- The Eleanor Sophia Wood Travelling Fellowships
- The Herbert Johnson Travel Grants\*
- The Commonwealth Scholarship and Fellowship Plan Awards

\*Grants in aid

## Grants in aid

Grants-in-aid are designed to provide supplementary living allowances, travel grants or grants-in-aid. Applicants must be:

1. enrolled full-time in a higher degree at the University of Sydney (some grants-in-aid are also open to part-time students and graduates), and
2. citizens or permanent residents of Australia.

Applicants are required to complete a single application form for the awards and they will be considered for the award(s) for which they are eligible.

If seeking one of the awards designed to support overseas travel, it is essential that applicants justify in their applications why support for overseas travel is being sought. Applicants should state whether their research can be undertaken in Australia and, if not, why it is necessary for them to travel overseas for purposes of study. Applicants should provide an outline of their proposed travel plans, indicating the extent to which the period of overseas study is necessary and is regarded to be integral to their total research program, in addition to details of current financial support and the amount of funding sought from the scholarships. If necessary, a separate sheet should be attached to the application form.

Applications must be lodged no later than the closing date of mid-May in each year.

These awards, details of which follow, are currently offered as grants-in-aid only in the Faculty of Agriculture, Food and Natural Resources.

Award	Maximum value \$
Norman Scott Noble Scholarship	1000
Irvine Armstrong Watson Scholarship	500

Note: The selection committees reserve the right to share any of the above awards.

## Further information

Other scholarships are available. Enquiries about scholarships should be made at the Research Office. International students should make their enquiries at the International Office. Enquiries about scholarships offered by other universities should be addressed to the registrar of the university concerned. Scholarship conditions may change without notice.



## 12. Other Faculty information

This chapter contains information specific to the faculty and some general information. For further details about discontinuation and examinations, as well as general information about the organisation of the University, assistance for students with disabilities, child care facilities, accommodation, health, counselling, financial assistance, careers advice and a range of other matters go to [www.usyd.edu.au](http://www.usyd.edu.au).

### Enrolment

Students who do not satisfy the pre-enrolment conditions should contact the faculty office at:

Suite 401, Biomedical Building  
1 Central Avenue  
Australian Technology Park  
Eveleigh NSW 2015

Phone: +61 2 8627 1000

Fax: +61 2 8627 1099

### Confirmation of enrolment

All the information provided when you enrol is added to the University's computerised student record system. This includes your degree, academic year and the units you are taking. It is important that this information be recorded correctly at the beginning of the year, and amended should a change occur in any of the details during the year. Any subject enrolment has a financial implication under the Higher Education Contribution Scheme (HECS).

To enable you to see what enrolment data has been recorded, you will be sent a "Confirmation of enrolment" notice shortly after completion of enrolment. You should check this carefully. If the information is correct you should keep the notice as a record of your current enrolment. Should the notice be incorrect in any detail, you should apply at the faculty office immediately to have your record amended. A new confirmation will then be prepared and sent to you. You will also receive, about two months after the beginning of each semester, a statement showing your HECS/fee assessment for that semester. If there appears to be an error in this assessment, you should follow the directions for correction of the assessment which are included on the statement.

### Changing or discontinuing your enrolment

If you wish to change a unit of study in which you are enrolled, or discontinue a unit of study, you may do so on the University website at MyUni within a limited range of dates, prior to and early in each semester. Outside those dates, you should apply at the faculty office. Your record at the University will not be correct unless you do this. It is not sufficient, for instance, to tell a professor or the lecturer, or even the faculty office that you discontinued a unit. Unless an enrolment change is approved on MyUni or at the faculty office (both of which should generate a new confirmation of enrolment form) it will not be accepted by the University and in some cases you will still incur a financial liability under HECS.

If you wish to discontinue enrolment totally you must provide written advice to the faculty office.

### Classes

The faculty takes all possible care to avoid timetable clashes between the core units in each year of the degrees, but it is the responsibility of each student to ensure they do not have any timetable clashes when taking repeat or elective units of study.

### Examinations

There are two formal examination periods each year.

Period	Held	Approximate duration
Semester 1	June	2 weeks
Semester 2	November	2 weeks

In addition, individual faculties and departments may examine at other times and by various methods of assessment, such as essays, assignments, viva voce, practical work. Some departments do not examine during the February semester.

The following information applies to the Bachelor of Agricultural Economics, Bachelor of Environmental Systems, Bachelor of Horticultural Science, Bachelor of Land and Water Science, Bachelor of Resource Economics and Bachelor of Science in Agriculture degrees.

#### Notification of examination results

The results of semester examinations are available on MyUni and posted to you at the end of each semester.

#### Disclosure of examination marks

Final marks will appear on your semester result notice. Marks may also be obtained from the faculty for the major components of assessment which make up the final marks. You are entitled to information about any details of the assessment procedures used to determine the final result.

Your examination scripts may be retrieved for up to six months after the completion of assessment in each unit. This does not apply to examination papers which involve the repeated use of the same material in successive examinations.

#### Examination grades

Each unit taken will be allotted one of the following grades at examinations.

Grade	Percent
High Distinction	85–100
Distinction	75–84
Credit	65–74
Pass	50–64
Fail	0–49



## Plagiarism

Plagiarism can be broadly defined as knowingly presenting another person's ideas, findings or written work as one's own by copying or reproducing them without due acknowledgment of the source. Plagiarism may involve copying the work of another student, or it may involve paraphrasing or copying a published author's text or argument without giving a reference. At its worst, plagiarism is theft.

Please read the University policy on plagiarism which may be viewed on the University website at:  
[www.usyd.edu.au/senate/policies/Plagiarism.pdf](http://www.usyd.edu.au/senate/policies/Plagiarism.pdf).

Students are required to submit a signed statement of compliance for all work submitted to the University for assessment, presentation or publication certifying that no part of the work constitutes a breach of this policy.

## The need to seek early advice

Many students in need of advice fail to make full use of the assistance available to them. If you believe that your performance during a course, or your preparation for your examinations, has been adversely affected by medical, psychological or family circumstances, you should seek advice as early as possible. Members of the teaching staff, especially your degree coordinator, the University Counselling Service and the University Health Service are all available for consultation and can give advice on appropriate action to take. Students can seek initial guidance from the faculty office about available help.

## Special consideration procedure

If you believe that your performance has been adversely affected by illness or other misadventure, you should submit a special consideration form to the faculty office. Only well-attested serious illness or misadventure during a semester or occurring at the time of an examination will warrant special consideration for academic performance. Occasional brief or trivial illness would not normally be regarded as sufficient to explain an absence or a poor performance and students are discouraged from submitting certificates for absences totaling less than one week, although frequent recurrent short absences would need documentation.

To apply for special consideration:

1. Obtain a special consideration application pack from the faculty office, University or faculty website or the Student Centre
2. Complete the special consideration forms (for consideration due to serious illness have a registered medical practitioner or counsellor complete the Professional Practitioner's Certificate; for consideration due to misadventure attach the appropriate documentation)
3. Lodge the form with the faculty office
4. Applications must be received within one week from the end of the period (i.e. assignment due date or date of examination) for which consideration is being sought
5. Retain the receipt that will be given on lodgement of the form.

Any application must be accompanied by appropriate medical certificates or other relevant documents. The Professional Practitioner Certificate must include:

1. dates of consultation
2. an evaluation by the practitioner, psychologist, etc, as to the severity, duration and effect on the student's ability to attend classes, learn or complete assessment requirements
3. a description of the nature and seriousness of the student's problems, within the limits of confidentiality, so that an academic assessment can be made of the possible effects of the illness or accident on the student's performance
4. any other relevant information relating to the student's illness, trauma, etc
5. any other documentation that may be relevant

6. confirmation the Practitioner authorises the University to contact them to verify the authenticity of the certificate.

## Statement of generic graduate attributes

The University states that our graduates' attitude towards scholarship, global citizenship and lifelong learning will set them apart from other graduates. Further, these broad attributes can be understood as a combination of five overlapping clusters of skills and abilities. These skills and abilities (contextualised for FAFNR) are shown below.

### 1. Research and Inquiry. Graduates of the University will be able to create new knowledge and understanding through the process of research and inquiry.

- Recognise and master appropriate theories, concepts and principles from a range of disciplines
- Collect and integrate several lines of evidence and apply them in a balanced way in an argument
- Design an experiment, investigation, survey or other means to test an hypothesis or proposition
- Critically analyse information, synthesising and summarising the outcomes
- Be able to clearly identify problems
- Apply knowledge and understanding to address familiar and novel problems
- Demonstrate awareness of the provisional nature of the facts and principles associated with a field of study
- Appreciate the issues of sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data
- Demonstrate ability to assess data quality
- Understand and manage the nature of risk and uncertainty in decision making
- Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques and packages
- Solve numerical problems using computer-based and non-computer based techniques

### 2. Information Literacy. Graduates of the University will be able to use information effectively in a range of contexts.

- Collect and record electronic or non-electronic information or data in the library, laboratory or field and summarise it using appropriate qualitative and/or quantitative techniques
- Appreciate and analyse financial and other management information, both current and historical, and use it in decision making
- Appreciate the difficulties of having incomplete information on which to base decisions
- Identify, evaluate and respond to a variety of information sources (e.g. electronic, textual, numerical, verbal, graphical)
- Identify, evaluate and respond to a variety of data types (e.g. scientific, non-scientific, primary and secondary)
- Demonstrate competence in the use of computer-based information handling and data processing tools
- Appreciate the economic, legal, social, ethical and cultural issues in the gathering and use of information

### 3. Personal and Intellectual Autonomy. Graduates of the University will be able to work independently and sustainably, in a way that is informed by openness, curiosity and a desire to meet new challenges.

- To be intellectually curious
- To be open to new ideas, methods and ways of thinking
- Identify individual and collective goals and responsibilities
- Devise strategies to achieve goals
- Assume responsibility for one's actions
- Reflect on and evaluate own performance as an individual and as a team member, and identify areas for future improvement

- Identify and work towards targets for personal, academic and career development
- Develop an adaptable and flexible approach to study and work
- Develop the skills necessary for self-managed and lifelong learning (e.g. working independently, time management and organisational skills)
- Develop independent thinking

**4. Ethical, Social and Professional Understanding. Graduates of the University will hold personal values and beliefs consistent with their role as responsible members of local, national, international and professional communities.**

- Recognise the complementary roles of leadership and management in an organisation
- Recognise and respect the views, opinions and contributions of other team members
- Recognise moral and ethical issues related to the subject
- Appreciate the need for professional codes of conduct where applicable
- Display the potential for competence, behaviour and attitudes required in a professional working life including initiative, leadership, team skills, and professional responsibility
- Devise, plan and undertake investigations in a responsible and safe manner, paying due attention to risk assessment, rights of access, relevant health and safety regulations, legal requirements and sensitivity to the impact of investigation on the environment and stakeholders
- Understand the role of agriculture, food and natural resources within the Australian society and economy, as well as being aware of the opportunities for international contributions and collaboration
- Display the capacity to be informed, responsible and critically discriminating participants in academic, social, cultural and moral issues, in the community of scholars, in the workforce and as citizens of both Australia and the world

**5. Communication. Graduates of the University will recognise and value communication as a tool for negotiating and creating new understanding, interacting with others, and furthering their own learning.**

- Communicate accurately, clearly, concisely, confidently and appropriately to a variety of audiences in written, verbal and graphical forms
- Contribute constructively to group discussions
- Listen to, appreciate and evaluate the views of others
- Use the internet critically and exhaustively as a means of communication and a source of information
- Use computer packages to create effective ways to communicate information

## Faculty computer laboratories

The faculty currently has four computer laboratories. They are used by undergraduate and postgraduate students undertaking units given by the Faculty of Agriculture, Food and Natural Resources. They can be used by arrangement with the faculty's Office at 9351 2936. Please consult the timetable on the entrance doors before proceeding into the laboratory. During some small classes casual access may be permitted, but please check with supervising staff first.

**Watt Computer Laboratory**, located in room 307 of the Watt Building A04. This laboratory has 27 PCs and is opened automatically at 7am and closed automatically at 7pm Monday to Friday (except for public holidays). After hours access is available to fourth year and postgraduate students on application to the faculty office.

**Environmentrics Laboratory**, located in room 202 of the Watt Building, A04. This laboratory has 35 PCs and is open automatically at 7:00 a.m. and closed automatically at 7:00 p.m. Monday to Friday (except for public holidays).

**Woolley Computer Laboratory**, located on the ground floor of the Woolley Building A20, and consisting of 16 PCs. This laboratory is not opened automatically, but fourth year and postgraduate students can be given a code for out-of-hours use from the faculty office.

**GIS Computer Laboratory**, located in Room XXX of the ATP C81. This laboratory has 16 computers and is not opened automatically and is generally restricted to students in certain units of study.

## Summer School

Most faculties at the University offer units of study from degree programs during January/February. As the University uses all of its HECS quota in first and second semester, these units are full fee-paying and entirely voluntary. However, Summer School units enable students to accelerate their degree progress, make up for a failed unit or fit in a unit which otherwise would not suit their timetables. New students may also gain a head start by completing requisite subjects before they commence their degrees. Units start in January and run for up to six weeks (followed by an examination week). Notice of the units available is contained in the various faculty handbooks and is usually circulated to students with their results notices. Fee waiver scholarships are available. See [www.summer.usyd.edu.au](http://www.summer.usyd.edu.au) for further details.

## Ancillary fees and charges

The following fees and charges should be used as a guide only.

### Printing charges

All students have free access to the Watt and Woolley computer laboratories of the faculty. Each year a printing allocation is set to cover what may be expected by way of assignments and computer output from practical classes. Currently the limits are 125 pages per year for external students to the faculty undertaking units of study with the faculty and 250 pages for first to third year students undertaking a degree with the faculty. Students may top up their print limit once their print quota is reached (e.g. \$10 per 125 pages). Information on how to top up printing can be found in the respective computer laboratories. Postgraduate research and fourth year honours students are provided with unlimited printing (within reason) to cover their research projects.

### Manuals and notes

Students are usually provided with unit of study material in class or through WebCT. Some manuals and lecture notes are sold at the University Copy Centre and students are advised of charges at the beginning of the respective unit.

### Excursions

Students are required to pay a fee towards the cost of excursions in some elective Year 3 and 4 units. Fees are determined by taking into account the cost of basic accommodation and adequate meals. Fees for these units of study can be ascertained from the unit of study coordinator.

## Libraries

### University of Sydney Library

The University of Sydney Library is a network of 12 libraries across eight campuses. Visit the Library website at: [www.library.usyd.edu.au](http://www.library.usyd.edu.au).

The specialist libraries for research in Agriculture are:

**Badham Library** – visit [www.library.usyd.edu.au/libraries/badham/](http://www.library.usyd.edu.au/libraries/badham/) and **Camden Library** – [www.library.usyd.edu.au/libraries/camden/](http://www.library.usyd.edu.au/libraries/camden/).

Your student card will allow you to borrow from any of the libraries in the system. Location maps, opening hours and contact details for each library are listed on the website (see below). Many of the other libraries will have information of interest to you too. Visit: [www.library.usyd.edu.au/libraries](http://www.library.usyd.edu.au/libraries).

The website also provides access to services including the library catalogue (at <http://opac.library.usyd.edu.au>) and a range of databases, which are used to find references to journal articles See [www.library.usyd.edu.au/databases](http://www.library.usyd.edu.au/databases).

It is possible to access many of these databases from off campus. Visit [www.library.usyd.edu.au/databases/wam.html](http://www.library.usyd.edu.au/databases/wam.html) for more information, or contact your Faculty Liaison Librarian.

Both the **Agriculture, Food and Natural Resources Subject Guide** ([at http://libguides.library.usyd.edu.au/agriculture](http://libguides.library.usyd.edu.au/agriculture)) and the animal science information-based **VEIN – Veterinary Education and Information Network** (see <http://vein.library.usyd.edu.au>) contain pointers to useful information sources.

## Faculty Liaison Librarians

Information specialists are available to assist you with your information needs.

### Camden and Narrabri campuses

Karen Black  
Email: [k.black@library.usyd.edu.au](mailto:k.black@library.usyd.edu.au)  
Phone: +61 2 9351 1627  
Fax: +61 2 4655 6719

### Camperdown Campus

Lea Dawson (Mon, Thur, Fri)  
Judy Reading (Tue, Wed)  
Email: [fafnr@library.usyd.edu.au](mailto:fafnr@library.usyd.edu.au)  
Ph: +61 2 9351 3629  
Fax: +61 2 9351 3852

## Mathematics Learning Centre

*Head – Jacqueline M Nicholas*

The Mathematics Learning Centre offers help to undergraduate students who enter the University with insufficient preparation in mathematics, to enable them to cope with the mathematical requirements of their chosen course. In the Faculty of Agriculture, Food and Natural Resources, units in Agricultural Economics, Biometry, Economics and Econometrics all assume a certain level of knowledge of mathematics. Generally, students entering the faculty are assumed to have taken HSC 2-unit mathematics or its equivalent. If you know that you lack this assumed knowledge, or if you are doubtful whether you are well enough prepared, you should contact the Mathematics Learning Centre.

Staff at the centre can help you decide which topics you need to do extra work on. Resources are provided for individual study, with guidance from the centre's staff, and small tutorials can be arranged for students who are having difficulties. Introductory and bridging courses are organised during the summer.

The centre is on the fourth floor of the Carslaw Building (Room 455). Any student seeking assistance should visit us at the centre, contact us by phone on +61 2 9351 4061 or see the information on our website at [www.usyd.edu.au/math\\_learning\\_centre](http://www.usyd.edu.au/math_learning_centre).

## Faculty societies

### The Sydney University Agricultural Society (AgSoc)

AgSoc is an association for the undergraduates of the Faculty of Agriculture, Food and Natural Resources, as well as students from rural backgrounds and anyone with an interest in agriculture. It is run by a student-elected committee from within the faculty, which organises social and sporting events. Details of how to join are explained during Orientation Week.

#### Why should you join?

There is a small annual membership fee to become part of AgSoc, which entitles you to vote, hold office, participate in faculty sports and obtain great discounts to all social functions as well as on the large range of "Agger" merchandise. Functions include formal events such as the annual ball, as well as numerous harbour cruises, barbecues and other informal occasions.

Membership of many other faculty societies is compulsory. This is not the case in Agriculture, yet large numbers of students join for every year of their degree – an indication of the close social interaction and love of a good time that makes Agriculture the envy of the larger faculties. The AgSoc Committee encourages all members of the faculty to become involved.

### Faculty of Agriculture Postgraduate Association (FAPA)

The Faculty of Agriculture Postgraduate Association (FAPA), a student-led committee, was formed in 2002, with the aim of facilitating a culture of social fraternity amongst postgraduate students in the faculty. FAPA builds upon proud traditions of former postgraduate societies that have enriched the student experience in the faculty since the 1920s. As a part of this commitment, all postgraduate students are automatically enrolled as members at no cost for a tenure lasting the duration of their degree.

Throughout the year FAPA holds social events open to all postgraduate students, such as trivia nights, lawn-bowling and lunch-time barbecues which are often subsidised by funding from the Faculty. The committee is always open to suggestions from all postgraduate students, and encourage students to participate in the proposal, planning and implementation of these social events.

### Sydney University Agricultural Graduates' Association (SUAGA)

SUAGA is a graduate society. All graduates of the Faculty of Agriculture, Food and Natural Resources, and all current and former members of the academic staff of the faculty, are eligible for membership. Some of the more important aims of the Association are to maintain and foster the relationship between agriculture graduates and the University, to promote social and cultural relationships among the graduates and to take an interest in any matters that may be of benefit to the faculty.

## Institutes and advisory councils

### The Institute of Advanced Studies within the Faculty of Agriculture, Food and Natural Resources

1. The name of the Institute shall be the Institute of Advanced Studies within the Faculty.
- 2.1 The Institute shall advise the Senate regarding the funds of the Joane Josephine Harris Bequest, the Thomas Lawrance Pawlett Bequest, the Mrs Christian Rowe Thornett Bequest, the Alexander Hugh Thurburn Fund, the Turland Endowment and the portion of the funds of the FH Loxton Bequest which has been allocated to the Faculty.

- 2.2 The Institute shall promote the attraction of additional income.
- 3.1 The Institute shall further the development of postgraduate studies and research in the Faculty.
- 3.2 The Institute shall be responsible for the administration of the scholarship program in the Faculty.
4. The names of the donors shall be perpetuated by their association with the various projects that the Institute initiates.
5. The Directors of the Institute will be:
  - 5.1 Ex officio
  - 5.2 Dean (Chair)
  - 5.3 Pro-Dean
  - 5.4 Associate Dean (*Postgraduate*)
  - 5.5 Postgraduate Coordinators, Director of the Plant Breeding Institute
  - 5.6 Two academic staff representatives, elected biennially at the final Faculty meeting of a year in which a term ends; a casual vacancy shall be filled on nomination by the Dean.
6. The directors shall submit recommendations for postgraduate activities to the Faculty for consideration and recommendation to Senate for approval.

### EJ Holtsbaum University of Sydney Agricultural Research Station

The EJ Holtsbaum University of Sydney Agricultural Research Station (HARS) has been established in conjunction with the gift by Mr EJ Holtsbaum to the University of his property "Nowley". Mr Holtsbaum, whose family had owned Nowley since 1964, made the gift with the view that the farm would continue to prosper under the University's stewardship, and serve as a centre on the Liverpool Plains for the creation and dissemination of innovative technology for agricultural production and natural resource management.

Nowley is located in the Spring Ridge district on the central/north west slopes of NSW, in a versatile and reliable dryland cropping region. The property of 2083 hectares supports a successful mixed farming enterprise centred on crops of wheat, barley and canola in winter, sorghum and sunflower in summer, and a Shorthorn cattle herd of breeders, replacement heifers and bulls.

Nowley has mostly fertile basaltic soils, an average annual rainfall of about 600 mm with a relatively even summer and winter distribution. The extreme variation in soil types and parent materials, and the proximity of a large, natural water body (Lake Goran), means that the property offers unique opportunities to study the impacts of parent material and topography on soil type, and consequently on agricultural opportunities. Stands of remnant native forest on sections of the property provide invaluable undisturbed reference sites for comparative studies of agricultural and native ecosystems, and the influence of human impacts.

Nowley will considerably enhance the faculty's academic programs by giving students a strong sense of the interaction of landscape and agriculture. While continuing to operate as a fully commercial enterprise, Nowley will provide an excellent field site for undergraduate and postgraduate students to learn and research about crop and livestock management in mixed farming systems, plant improvement, and natural resource management.

#### Objectives of the Holtsbaum Agricultural Research Station (HARS)

The objectives of the HARS are aligned with a Statement of Intention made by Mr Holtsbaum in conjunction with his gift.

*"Nowley is to be used for the purposes of the Faculty of Agriculture, Food and Natural Resources (hereafter referred to as 'the faculty') including in particular but not limited to:*

- *research for the benefit of primary producers, researchers, students and other parties interested in agriculture*
- *provision of funds for scholarships to the faculty.*

*A wide range of enterprises should be trialled and evaluated as the need or otherwise arises in conjunction with the 'bread and butter' activities of the day.*

The results of these activities to be carried out at 'Nowley' to be available to farmers, faculty students, research workers and other parties with an interest in agriculture. The future mix of enterprises on the property will be determined to produce a viable income. After retention of profits or part thereof to provide working capital, any surplus is to be directed into a scholarship fund for the faculty or for the benefit of teaching and research in agriculture as determined by the Dean in consultation with the Management Advisory Board. The property's well-being is of paramount importance and number one priority.

#### Management of the Holtsbaum Agricultural Research Station

The purchase of plant and equipment, working capital and additional land by the University was financed by the creation of an internal Property Trust known as the "Nowley Property Pool". In recognition of the gift by Mr Holtsbaum, and additional funds invested in the Nowley Property Pool by the faculty, the latter will be allocated approximately 74 per cent of the units in the Pool, with Livingston Farm to purchase the remaining 26 per cent of the units in the Pool.

Net operating surpluses will be distributed proportionately to unit holders in the Nowley Property Pool. The Properties and Investments Office will be responsible to the Management Advisory Committee for the day to day operation of the property, which will be managed as part of the rural property portfolio. Research and innovative trials by the faculty will be oversighted by the Management Advisory Board.

In the event a situation arises where the Advisory Board recommends that the property be disposed of, it will be done so in a manner that will realise the faculty the highest sum of money attainable on the day. The proceeds may be invested in a similar venture or one suitable to the faculty and management of the day. Whatever the new venture, the name "EJ Holtsbaum" is to be preserved.

#### Holtsbaum Agricultural Research Station Management Advisory Board: Terms of Reference

To oversight the management of the Holtsbaum Agricultural Research Station in order to ensure that it:

- operates as a financially viable enterprise
- facilitates research for the benefit of primary producers, researchers, students and other parties interested in Agriculture
- provides funds for the provision of scholarships and other activities for the benefit of teaching and research in the faculty.

The Management Advisory Board will:

- receive financial statements relating to the property
- receive reports from the Dean of the faculty relating to the use of the property for teaching, research and outreach activities.
- receive reports from the Properties and Investments Office relating to operational and financial aspects of the enterprise.
- advise the Dean of the faculty on the distribution of the EJ Holtsbaum Trust's share of the profits from the Nowley Property Pool for scholarships and other activities for the benefit of teaching and research programs.

The Management Advisory Board will meet at least twice per year.

The HARS Management Advisory Board will consist of:

- The Dean of the faculty
- A representative of the faculty
- The working Manager
- Two practising agriculturists within reasonable proximity of 'Nowley'
- The Director, University Properties and Investments

According to Mr Holtsbaum's Statement of Intention, "practising agriculturists" are to provide local knowledge. Their term of appointment should be at least three years, and they should be "quiet achievers" in their own right, demonstrating an ability to run a sound and profitable enterprise or having exceptional expertise in a field or fields relevant to the prevailing pursuit/s on Nowley. The initial

appointments have been made by Mr Holtsbaum, and will be made subsequently by the Advisory Board. They shall not be nominated by former bodies, Boards or vested interests or politicians. The positions are honorary, apart from reimbursement for out-of-pocket expenses.

### **Scholarships**

Should the Management Advisory Board determine there is sufficient money available for scholarship allocation Mr Holtsbaum made the following suggestions, in addition to conditions that normally apply in the University for the award of scholarships. The recipient shall be of

high academic merit and show the intention to establish a career in agriculture (in whatever form). The Scholarship would be known as "The EJ Holtsbaum University of Sydney Faculty of Agriculture, Food and Natural Resources Scholarship".

The intention of the scholarships is to help students fund their studies, and to encourage in recipients a sense of giving something back to the land through their degree, should they have the opportunity to do so. Allocation of money for scholarships will be determined by the faculty, in consultation with the Management Advisory Board.



# The Sydney Summer and Winter Schools

2010	Dates
Summer School	December 2009 to February 2010
Winter School	28 June to 24 July 2009

## The Summer School

The Summer School is a full fee-paying, intensive program offering high quality undergraduate and postgraduate subjects from nine faculties. These subjects are the same as those offered in Semesters One and Two, but are taught as an intensive program over summer.

Some classes commence in December; others commence in the first week of January; others in the third week and continue into February (including the exam week). Some subjects run for six weeks; others are shorter. Students can take a maximum of two subjects.

## The Winter School

The Winter School is a smaller, more intensive program that runs for four weeks, including the exam week, during July.

## Advantages

Attending classes at the University of Sydney during the summer and winter holidays offers many advantages. You can:

- accelerate your academic career and finish your degree sooner
- devote your full attention to a single area of study
- take subjects that are outside your normal degree
- reduce your workload throughout the rest of the year
- repeat subjects in which you may have been unsuccessful
- combine study with a field trip in Australia or a tour overseas.

High school graduates can sample a university subject, and get an early start on their degree.

## How to apply

Applications are only accepted online (at [www.summer.usyd.edu.au](http://www.summer.usyd.edu.au)). Most subjects have limited places and fill very quickly. All places are filled strictly on a first-in, first-served basis so it is recommended that you apply early.

Applications open on:

- 1 October 2009 (Summer School)
- 24 May 2010 (Winter School)

Applications close:
27 November 2009 (Session 1, Summer December)
11 December 2009 (Session 2, Summer Main)
8 January 2010 (Session 3, Summer Late)
11 June 2010 (Winter School)

**Late application fees may apply after these dates.**

## Census dates

Students can withdraw from their subject without academic penalty and receive a full refund until the census date (based on when the class commences). However, a late withdrawal fee may apply.

There is one census date for the Winter School, and three for the Summer School, as classes start between December and February.

ID	Session name	Classes begin	Census date
42*	Summer December	7 December 2009	4 January 2010
43	Summer Main	4 January 2010	11 January 2010
44**	Summer Late	18 January 2010	29 January 2010
11	Winter School	28 June 2010	3 July 2010

\* 42 Summer December: Allows for a unit to run for 3 to 9 weeks, provided that the 20 per cent criterion is met.

\*\* 44 Summer Late: Last exam must be held by 1 March.

## Withdrawal and refund policy

- For Summer School classes starting in **December 2010**, students who withdraw from a subject between 28 November 2009 and the relevant census date will receive a refund of tuition fees but will be liable for a \$500 late withdrawal fee.
- For Summer School classes starting in **January 2010**, students who withdraw from a subject between 12 December 2009 and the relevant census date will receive a refund of tuition fees but will be liable for a \$500 late withdrawal fee.
- For Winter School classes starting on **28 June 2010**, students who withdraw from a subject between 21 June 2010 and the relevant census date will receive a refund of their tuition fees but will be liable for a \$500 late fee withdrawal.

Students may withdraw from their Summer or Winter School subject(s) up until 4pm on the last day of the teaching period for that particular subject. However, there may be an academic penalty (please refer to our website). The teaching period for purposes of this policy is defined in hours of published classes from the first day through to the last day of classes, excluding any final examination or assessment.

Students who withdraw from a subject after 4pm on the relevant census date will receive no refund of their tuition fee.

## Transferring between subjects

Students on a waiting list can transfer between subjects at any time prior to the commencement of class. For all other students, transfers should be completed a week before classes commence. **No** transfers will be allowed after commencement of the class.

## Summer and Winter School scholarships

### Merit scholarships

Three undergraduate merit scholarships and one postgraduate merit scholarship are available. These are automatically awarded to the top four students in their respective faculty (Arts, Science, or Economics and Business) for their Summer School subject.

### Educational/Financial Disadvantage scholarships

Full Summer School scholarships are available to local undergraduate students who have a good academic record. To be eligible for consideration you will need to provide evidence of long-term and serious educational disadvantage based on two or more criteria, one of which must be financial hardship. Please check our website for further details. Scholarship applications close on 30 October 2009 (Summer School), and 9 June 2010 (Winter School).

## For more information

Website: [www.summer.usyd.edu.au](http://www.summer.usyd.edu.au)

Email: [info@summer.usyd.edu.au](mailto:info@summer.usyd.edu.au)

Phone: +61 2 9351 5542 Fax: +61 2 9351 5888





# General University information

For further information or advice, please call our toll-free helpline on **1300 362 006**.

This section includes information on the following:

Academic progression  
 Accommodation Service  
 Admissions Office  
 Applying for a course  
 Attendance  
 Bus service  
 Campuses  
 Careers Centre  
 Centre for Continuing Education (CCE)  
 Centre for English Teaching (CET)  
 Child Care Information Office  
 The Co-op Bookshop  
 Counselling Service  
 Disability Services  
 Employment opportunities for students  
 Enrolment  
 Environmental Policy  
 Equity Support Services  
 Examinations  
 Fees  
 Financial Assistance Office  
 Freedom of information  
 Graduations Office  
 Grievances and appeals  
 HECS and Domestic Fees Office  
 Information and Communications Technology  
 International Office  
 International Student Support Unit (ISSU)  
 Koori Centre and Yooroang Garang  
 Learning Centre  
 Library  
 Mathematics Learning Centre  
 Museums and galleries  
 MyUni student portal  
 Orientation and O-Week  
 Part-time, full-time attendance  
 Policy online  
 Printing service (UPS)  
 Privacy  
 Research Office  
 Revenue Services  
 Scholarships for undergraduates  
 Security Service  
 Service Management, Information and Communications Technology (ICT)  
 Special Consideration  
 Staff and Student Equal Opportunity Unit (SSEOU)  
 Student administration and support  
 Student Centre  
 Student course material (online stores)  
 Student identity cards  
 Sydney Summer School  
 SydneyTalent  
 Sydney Welcome Orientation and Transition Program (SWOT)  
 The University of Sydney Foundation Program (USFP)  
 Timetabling Unit  
 University Health Service

## Academic progression

The University requires students to maintain a minimum rate of progression throughout their candidature. Any student who does not satisfy progression requirements for their degree will be placed on a monitored academic progression program. This program requires students to consult an academic adviser in their faculty, to attend a support services information session, and to fill in a survey. Students will be advised of program requirements by their faculty.

Students who do not sustain the minimum academic progression requirements may be asked to 'show cause' as to why they should not be excluded from their degree. For further information, please see [www.usyd.edu.au/secretariat/students](http://www.usyd.edu.au/secretariat/students)

Student Affairs, Executive Governance  
 Level 5, Jane Foss Russell Building, G02  
 The University of Sydney  
 NSW 2006 Australia

Phone: +61 2 8627 8425  
 Fax: +61 2 8627 8484  
 Email: [appeals@secretariat.usyd.edu.au](mailto:appeals@secretariat.usyd.edu.au)

## Accommodation Service

The Accommodation Service helps students find off-campus accommodation. It maintains an extensive database of accommodation close to campus or with easy access to public transport. For more information visit the Accommodation page: [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

Level 5, Jane Foss Russell Building, G02  
 The University of Sydney  
 NSW 2006 Australia

Phone: +61 2 9351 3312  
 Fax: +61 2 8627 8484  
 Email: [accomm@stuserv.usyd.edu.au](mailto:accomm@stuserv.usyd.edu.au)  
 Website: [www.usyd.edu.au/accommodation](http://www.usyd.edu.au/accommodation)

## Admissions Office

The Admissions Office, located in the Student Centre, is responsible for overseeing the distribution of offers to undergraduate applicants through the Universities Admissions Centre (UAC). They can advise prospective local undergraduate students on admission requirements. Postgraduate students should contact the appropriate faculty.

- If you are an Australian citizen, or permanent resident with qualifications from a non-Australian institution, you can get more information by phoning +61 2 8627 8209.
- For enquiries regarding special admissions (including mature-age entry), phone +61 2 8627 8207.
- Applicants without Australian citizenship or permanent residency should contact the International Office.

Admissions Office, Student Centre  
 Level 3, Jane Foss Russell Building, G02  
 The University of Sydney  
 NSW 2006 Australia

Phone: +61 2 8627 8210 or +61 2 8627 8209  
 Fax: +61 2 8627 8278  
 Email: [admissions@records.usyd.edu.au](mailto:admissions@records.usyd.edu.au)  
 Website: [www.usyd.edu.au/future\\_students/how\\_to\\_apply](http://www.usyd.edu.au/future_students/how_to_apply)



## Applying for a course

### Domestic applicants for undergraduate courses and programs of study

For the purpose of admission and enrolment, 'domestic applicant' refers to citizens and permanent residents of Australia and citizens of New Zealand. If you are in this group and wish to apply for admission to an undergraduate course, you would generally apply through the Universities Admissions Centre (UAC).

The deadline for applications is the last working day in September in the year before enrolment. For more information see [www.uac.edu.au](http://www.uac.edu.au)

Some faculties have additional application procedures, such as the Conservatorium of Music, Sydney College of the Arts, Pharmacy and Dentistry (for the Bachelor of Oral Health).

### Domestic applicants for postgraduate courses and programs of study

For the purpose of admission and enrolment, 'domestic applicant' refers to citizens and permanent residents of Australia and citizens of New Zealand. Application is direct to the faculty which offers the course that you are interested in. Application forms for postgraduate coursework, postgraduate research and the master's qualifying or preliminary program, and for non-award postgraduate study can be found at [www.usyd.edu.au/future\\_students](http://www.usyd.edu.au/future_students)

Note: some faculties use their own specially tailored application forms. Check with the relevant faculty.

### International applicants for all course types (undergraduate and postgraduate)

'International applicants' refers to all applicants other than Australian citizens, Australian permanent residents and citizens of New Zealand. In the majority of cases international applicants apply for admission through the University's International Office (IO). All the information international applicants need, including application forms, is available from the IO website ([www.usyd.edu.au/internationaloffice](http://www.usyd.edu.au/internationaloffice)).

## Attendance

See 'Special Consideration'.

## Bus service

A free bus service operates to, from and around the Camperdown and Darlington campuses each weekday that Fisher Library is open (except for public holidays). The service begins at 4.15pm and ends at Fisher Library closing time.

Two buses operate along the route, starting at Fisher Library and finishing at Redfern station. The buses leave at approximately 10 minute intervals during semester and in semester breaks.

The bus timetable/route guide can be collected from Security Administration or Campus Infrastructure Services reception.

Floor 2, Services Building, G12  
Corner of Codrington and Abercrombie streets  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 4753  
Fax: +61 2 9351 5699  
Website: [www.facilities.usyd.edu.au/security](http://www.facilities.usyd.edu.au/security)

## Campuses

The University has 10 different teaching campuses, located throughout the Sydney area. For information on each campus, including maps, contact details and parking information, see [www.usyd.edu.au/about/campuses](http://www.usyd.edu.au/about/campuses)

Campus	Faculties
Camperdown and Darlington campuses	Faculty of Agriculture, Food and Natural Resources Faculty of Architecture, Design and Planning Faculty of Arts Faculty of Economics and Business Faculty of Education and Social Work Faculty of Engineering and Information Technologies Faculty of Law (Sydney Law School) Faculty of Medicine (Sydney Medical School) Faculty of Pharmacy Faculty of Science Faculty of Veterinary Science The Sydney Summer School
Cumberland Campus	Faculty of Health Sciences
St James Campus	Faculty of Law (teaching spaces only)
Mallett Street Campus	Faculty of Nursing and Midwifery The Centre for English Teaching The NHMRC Clinical Trials Centre
Sydney Conservatorium of Music	Sydney Conservatorium of Music
Sydney College of the Arts	Sydney College of the Arts (SCA)
Camden Campus	Faculty of Veterinary Science Faculty of Agriculture, Food and Natural Resources
Surry Hills Campus	Faculty of Dentistry
Burren Street Campus	Institute of Transport and Logistics Studies

## Careers Centre

The University's Careers Centre provides students with career planning and employability skills development.

The Careers Centre services are free and include:

- help finding casual, part-time, full-time and graduate employment
- an internet job vacancy database
- individual careers counselling
- a comprehensive resource centre and online resources
- workshops in resume writing, interview skills, job searching and skills development
- careers fairs and employer information sessions.

Careers Centre  
Level 5, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8402  
Fax: +61 2 8627 8477  
Email: [careers.information@usyd.edu.au](mailto:careers.information@usyd.edu.au)  
Website: [www.careers.usyd.edu.au](http://www.careers.usyd.edu.au)

## Centre for Continuing Education (CCE)

The CCE provides the community with the opportunity to engage with the University of Sydney, offering people access to the academic expertise of one of Australia's finest educational institutions.

The CCE provides lifelong learning opportunities for people at all stages of life who want to undertake a course in self-enrichment, engage in active retirement learning, upgrade their professional skills and qualifications, or bridge a gap between previous study and university. CCE offers short courses in all areas of the humanities and social sciences, languages, science and technology, business and management, and continuing professional development.

160 Missenden Road  
Newtown NSW 2042  
(Postal address: Locked Bag 2020, Glebe NSW 2037)

Phone: +61 2 9036 4789  
Fax: +61 2 9036 4799  
Email: [cce.info@usyd.edu.au](mailto:cce.info@usyd.edu.au)  
Website: [www.cce.usyd.edu.au](http://www.cce.usyd.edu.au)

## Centre for English Teaching (CET)

The CET offers English language and academic study skills programs to international students who need to develop their English language skills in order to meet academic entry requirements.

Wentworth Building, G01  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9036 7900  
Fax: +61 2 9036 7910  
Email: [info@cet.usyd.edu.au](mailto:info@cet.usyd.edu.au)  
Website: [www.usyd.edu.au/cet](http://www.usyd.edu.au/cet)

## Child Care Information Office

Five child care centres operate on or near the Camperdown, Darlington and Cumberland campuses, catering for over 220 children aged from six weeks to five years. The centres are managed by qualified staff and provide programs that are developmentally appropriate and responsive to the needs of the individual child. The Child Care Information Office is the first point of contact for students and staff looking for information about child care services such as long day care, occasional care, vacation care and family day care.

For more information visit the student services page at [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

Child Care Information Office  
Level 5, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8419  
Fax: +61 2 8627 8480  
Email: [childc@stuserv.usyd.edu.au](mailto:childc@stuserv.usyd.edu.au)  
Website: [www.usyd.edu.au/child\\_care](http://www.usyd.edu.au/child_care)

## The Co-op Bookshop

The Co-op Bookshop is a one-stop store for:

- text and reference books
- general books
- University of Sydney clothing and memorabilia
- DVDs
- flash drives
- software at academic prices.

Take advantage of a lifetime of membership benefits. For a one-time fee of \$20, you are entitled to great member pricing, promotional offers and much more.

The Co-op Bookshop  
Sports and Aquatic Centre Building, G09  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 3705  
Fax: +61 2 9660 5256  
Email: [sydu@coop-bookshop.com.au](mailto:sydu@coop-bookshop.com.au)  
Website: [www.coop-bookshop.com.au](http://www.coop-bookshop.com.au)

## Counselling Service

Counsellors are qualified professionals who aim to help people fulfill their academic, individual and social goals. The Counselling Service helps students develop effective and realistic coping strategies and master essential study and life management skills.

Students can make appointments for 50-minute sessions. Walk-in (25-minute) sessions are available for urgent problems every day from 11am to 3pm during semesters, and after-hours appointments are also available. In addition, the service offers workshops each semester on a wide range of student concerns. These are open to local and

international, undergraduate and postgraduate students. There are specific workshops to help first-year students successfully adapt to university study.

For more information visit the student services page at [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

### Camperdown and Darlington campuses

Level 5, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8433  
Fax: +61 2 8627 8482  
Email: [counsell@stuserv.usyd.edu.au](mailto:counsell@stuserv.usyd.edu.au)  
Website: [www.usyd.edu.au/counselling](http://www.usyd.edu.au/counselling)

### Cumberland Campus

Ground Floor, A Block, C42  
The University of Sydney  
East Street, Lidcombe  
NSW 2141 Australia

Phone: +61 2 9351 9638  
Fax: +61 2 9351 9635  
Email: [cs.cumberland@stuserv.usyd.edu.au](mailto:cs.cumberland@stuserv.usyd.edu.au)

## Disability Services

Disability Services is the principal point of contact providing advice for students with disabilities. Disability Services staff work closely with academic and administrative staff to ensure that students receive reasonable adjustments in their study. The unit produces a number of publications explaining the disability support services available within the University.

Students are encouraged to make contact with Disability Services prior to commencement or as early in their studies as possible. Available help includes assistive technology, note-taking, interpreters, and advocacy with academic staff to negotiate assessment and course requirement modifications where appropriate. Students must register with Disability Services to receive assistance.

For more information visit [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

### Camperdown and Darlington campuses

Level 5, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8422  
Fax: +61 2 8627 8482  
Email: [disserv@stuserv.usyd.edu.au](mailto:disserv@stuserv.usyd.edu.au)  
Website: [www.usyd.edu.au/disability](http://www.usyd.edu.au/disability)

### Cumberland Campus

Ground Floor, A Block, C42  
The University of Sydney  
East Street, Lidcombe  
NSW 2141 Australia

Phone: +61 2 9351 9638  
Fax: +61 2 9351 9635  
Email: [ds.cumberland@stuserv.usyd.edu.au](mailto:ds.cumberland@stuserv.usyd.edu.au)

## Employment opportunities for students

See 'Careers Centre', 'SydneyTalent'.

## Enrolment

### Domestic and international students entering their first year via UAC

Details of enrolment procedures will be sent to students with their UAC offer of enrolment. Enrolment takes place during the last week of January or in February for the later offer rounds.

### Domestic and international students entering their first year via a direct offer from the University

Details of the enrolment procedures will be sent to students with their University offer of enrolment. Enrolment takes place during the first two weeks of February.

### All continuing domestic and international students

A pre-enrolment package is sent to all enrolled students in late September and contains instructions on the procedure for web-based pre-enrolment.

## Environmental Policy

The University of Sydney's Environmental Policy promotes sustainable resource and product use and encourages the practice of environmental stewardship by staff and students. The policy is supported by the University-wide Sustainable Campus Program. Enquiries can be directed to:

Manager, Campus Sustainability  
Phone: +61 2 9036 5441  
Email: [sustainable@usyd.edu.au](mailto:sustainable@usyd.edu.au)

Visit the website [www.usyd.edu.au/sustainable](http://www.usyd.edu.au/sustainable) to find out what the University is doing, and learn how you can get involved or make suggestions.

## Equity Support Services

Equity Support Services brings together a number of student support services that provide practical assistance and information to help students meet their academic and personal goals while at University.

Services include the Accommodation Service, Child Care Information Office, Disability Services and the Financial Assistance Office. For more information visit [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

## Examinations

The Examinations Office arranges the end-of-semester examination periods in June and November each year and provides assistance for faculty staff with examinations held at other times. Staff and students can find information about examinations at [www.usyd.edu.au/current\\_students/student\\_administration/examinations](http://www.usyd.edu.au/current_students/student_administration/examinations) or contact the Examinations Office directly.

Student Centre  
Level 3, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8200 or +61 2 8627 8217  
Fax: +61 2 8627 8279  
Email: [exams.office@exams.usyd.edu.au](mailto:exams.office@exams.usyd.edu.au)  
Website:  
[www.usyd.edu.au/current\\_students/student\\_administration/examinations](http://www.usyd.edu.au/current_students/student_administration/examinations)

## Fees

See 'Revenue Services Office'.

## Financial Assistance Office

The University has a number of loan funds and bursaries to help students who experience financial difficulties. Assistance is not intended to provide the principal means of support but to help in emergencies and supplement other income. Financial assistance is available for undergraduate and postgraduate students enrolled at the University of Sydney in degree and diploma programs. It is for essential living and study expenses.

Financial assistance consists of loans, which are usually repayable within one year, and bursaries, which may be awarded as part of a financial assistance package, depending on financial need and academic merit (average marks at credit level or higher). Advertised bursaries are also available and must be applied for separately by 30 April (see website for details). Bursaries are generally only available to local full-time undergraduate students.

For more information visit [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

Level 5, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 2416  
Fax: +61 2 8627 8480  
Email: [fao@stuserv.usyd.edu.au](mailto:fao@stuserv.usyd.edu.au)  
Website: [www.usyd.edu.au/financial\\_assistance](http://www.usyd.edu.au/financial_assistance)

## Freedom of information

The University of Sydney falls within the jurisdiction of the *NSW Freedom of Information Act 1989*. The Act:

- requires information concerning documents held by the University to be made available to the public
- enables a member of the public to obtain access to documents held by the University
- enables a member of the public to ensure that records held by the University concerning his or her personal affairs are not incomplete, incorrect, out of date or misleading.

A 'member of the public' includes staff and students of the University.

It is a requirement of the Act that applications be processed and a determination made within a specified time period, generally 21 days. Determinations are made by the University's Deputy Registrar.

While an application may be made to access University documents, some may not be released in accordance with particular exemptions provided by the Act. There are review and appeal mechanisms which apply when access has been refused.

The University is required to report to the public on its freedom of information activities on a regular basis and to produce two documents: a *Statement of Affairs* (annually) and a *Summary of Affairs* (every six months).

The *Statement of Affairs* contains information about the University, its structure, function and the kinds of documents held. The *Summary of Affairs* identifies the University's policy documents and provides information on how to make an application for access to University documents. More information and copies of the reports can be found at [www.usyd.edu.au/arms/info\\_freedom](http://www.usyd.edu.au/arms/info_freedom)

## Graduations Office

The Graduations Office is responsible for organising graduation ceremonies and informing students of their graduation arrangements.

Student Centre

Level 3, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8223 or +61 2 8627 8224

Protocol enquiries: +61 2 8627 8221

Fax: +61 2 8627 8281

Email: [grads.office@usyd.edu.au](mailto:grads.office@usyd.edu.au)

## Grievances and appeals

You may consider that a decision affecting your candidature for a degree or other activities at the University has not taken into account all relevant matters. In some cases the by-laws or resolutions of the Senate provide for a right of appeal against particular decisions. For example, there is provision for appeal against academic decisions, disciplinary decisions and exclusion after failure.

A document outlining the current procedures for appeals against academic decisions is available at the Student Centre, the Student Representative Council, and on the Policy Online website ([www.usyd.edu.au/policy](http://www.usyd.edu.au/policy) click on 'Study at the University', then 'Appeals' – see the Academic Board and Senate resolutions).

For assistance or advice regarding an appeal contact:

### Undergraduates

Students' Representative Council  
Level 1, Wentworth Building, G01  
The University of Sydney  
NSW 2006 Australia  
Phone: +61 2 9660 5222  
[www.src.usyd.edu.au](http://www.src.usyd.edu.au)

### Postgraduates

Sydney University Postgraduate Representative Association (SUPRA)  
Corner of Raglan and Abercrombie  
The University of Sydney  
NSW 2006 Australia  
Phone: +61 2 9351 3115  
[www.supra.usyd.edu.au](http://www.supra.usyd.edu.au)

## HECS and Domestic Fees Office

The HECS and Domestic Fees Office assists domestic students with queries relating to their entitlements for Commonwealth Support, HELP-Loans, domestic full fees and the Research Training Scheme (RTS). Students' entitlements are also assessed based on their citizenship or residency status.

Student Centre

Level 3, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8239

Fax: +61 2 8627 8285

Email: [hecs.fees@records.usyd.edu.au](mailto:hecs.fees@records.usyd.edu.au)

## Information and Communications Technology (ICT)

See 'Service Management, Information and Communications Technology'.

## International Office

The International Office helps international students with application, admission and enrolment procedures. It has units responsible for international marketing, government and student relations, international scholarships (including AusAID scholarships and administrative support for international financial aid programs), and compliance with government regulations relating to international students. The Study Abroad and Student Exchange units help domestic and international students who wish to enrol for overseas study or exchange programs.

### International Office

Level 4, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8300

Fax: +61 2 8627 8387

Email: [info@io.usyd.edu.au](mailto:info@io.usyd.edu.au)

Website: [www.usyd.edu.au/internationaloffice](http://www.usyd.edu.au/internationaloffice)

### Study Abroad

Phone: +61 2 8627 8322

Fax: +61 2 8627 8390

Email: [studyabroad@io.usyd.edu.au](mailto:studyabroad@io.usyd.edu.au)

Website: [www.usyd.edu.au/studyabroad](http://www.usyd.edu.au/studyabroad)

### Student Exchange

Phone: +61 2 8627 8322

Fax: +61 2 8627 8482

Email: [exchange@io.usyd.edu.au](mailto:exchange@io.usyd.edu.au)

Website: [www.usyd.edu.au/studentexchange](http://www.usyd.edu.au/studentexchange)

## International Student Support Unit (ISSU)

The International Student Support Unit (ISSU) aims to help international students develop successful strategies for coping with the challenges of living and studying in an unfamiliar culture, to achieve success in their studies, and to make the experience of being an international student rewarding and enjoyable.

ISSU's student counsellors are qualified professionals with extensive experience in cross-cultural counselling. They provide an integrated service to international students and their families, which includes free and confidential counselling, welfare advice, information, and assistance with accessing other support services and resources on campus and in the community.

Other ISSU services include pre-departure information, on-arrival information sessions and an orientation program for new international students. There is also a program of social and cultural activities which runs throughout the year. International students also have access to all University student support services.

### Camperdown and Darlington campuses

Level 5, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8437

Fax: +61 2 8627 8482

Email: [info@issu.usyd.edu.au](mailto:info@issu.usyd.edu.au)

Website: [www.usyd.edu.au/issu](http://www.usyd.edu.au/issu)

### Cumberland Campus

Ground Floor, A Block, Cumberland Campus, C42  
The University of Sydney  
East Street, Lidcombe  
NSW 2141 Australia

Phone: +61 2 9351 9638

Fax: +61 2 9351 9635

Email: [issu.cumberland@stuserv.usyd.edu.au](mailto:issu.cumberland@stuserv.usyd.edu.au)

Website: [www.usyd.edu.au/issu](http://www.usyd.edu.au/issu)

## Koori Centre and Yooroang Garang

The Koori Centre and Yooroang Garang support Aboriginal and Torres Strait Islander people in all aspects of tertiary education at the University of Sydney. The Cadigal Special Entry Program helps Indigenous Australians enter undergraduate study across all areas of the University.

As well as delivering block-mode courses for Indigenous Australian students, the Koori Centre teaches Indigenous Australian Studies in various faculties across mainstream courses. The Koori Centre also provides tutorial assistance, and student facilities including a computer lab, Indigenous research library and study rooms for the University's Indigenous Australian students.

In particular, the Koori Centre aims to increase the successful participation of Indigenous Australians in undergraduate and postgraduate degrees, develop the teaching of Aboriginal studies, conduct research in the field of Aboriginal education, and establish working ties with schools and communities.

The Koori Centre works in close collaboration with Yooroang Garang, Indigenous Student Support Unit in the Faculty of Health Sciences at the Cumberland Campus. Yooroang Garang provides assistance, advice and academic support for Indigenous students in the faculty, as well as preparatory undergraduate and postgraduate courses.

### Koori Centre

Ground Floor, Old Teachers College, A22  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 2046 (general enquiries)  
Toll-free within Australia: 1800 622 742  
Community Liaison Officer: +61 2 9351 7003  
Fax: +61 2 9351 6923  
Email: [koori@koori.usyd.edu.au](mailto:koori@koori.usyd.edu.au)  
Website: [www.koori.usyd.edu.au](http://www.koori.usyd.edu.au)

### Yooroang Garang

T Block, Level 4, Cumberland Campus, C42  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 9066  
Toll free: 1800 000 418  
Fax: +61 2 9351 9400  
Email: [yginfo@fhs.usyd.edu.au](mailto:yginfo@fhs.usyd.edu.au)  
Website: [www.fhs.usyd.edu.au/yooroang\\_garang](http://www.fhs.usyd.edu.au/yooroang_garang)

## Learning Centre

The Learning Centre helps students develop the generic learning and communication skills that are necessary for university study and beyond. The centre is committed to helping students achieve their academic potential during their undergraduate and postgraduate studies.

Learning Centre staff can be found at the Camperdown and Cumberland campuses. The centre's program includes a wide range of workshops on study skills, academic reading and writing, oral communication skills and postgraduate writing and research skills. Other services include an individual learning program, a faculty-based program and access to online and print-based learning resources.

For details of programs, activities and online resources available from the Learning Centre, see its website.

### Camperdown and Darlington campuses

Level 7, Education Building, A35  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 3853  
Fax: +61 2 9351 4865  
Email: [learning.centre@usyd.edu.au](mailto:learning.centre@usyd.edu.au)  
Website: [www.usyd.edu.au/lc](http://www.usyd.edu.au/lc)

### Cumberland Campus

Ground Floor, A Block, C42  
The University of Sydney  
East Street, Lidcombe  
NSW 2141 Australia

Phone: +61 2 9351 9638  
Fax: +61 2 9351 9635  
Email: [lc.cumberland@usyd.edu.au](mailto:lc.cumberland@usyd.edu.au)  
Website: [www.usyd.edu.au/stuserv/learning\\_centre/cumberl.shtml](http://www.usyd.edu.au/stuserv/learning_centre/cumberl.shtml)

## Library

The University of Sydney Library provides services via a network of libraries on eight campuses, and online at [www.library.usyd.edu.au](http://www.library.usyd.edu.au)

The location, opening hours and specific subject focus of each library is listed on the website. Over 5.5 million items are available via the library catalogue, including more than 67,000 online journals and 325,000 online books.

Enrolled students are entitled to borrow from any of the University libraries. Reading list books and articles are available via the reserve service either online or in print. Past examination papers are also available online.

Library facilities include individual and group study spaces, computers, printers, multimedia equipment, photocopiers and adaptive technologies. Refer to the 'Libraries' link on the University website to find out about services and facilities in specific libraries.

Library staff are available in every library to support students with their study and research. Faculty liaison librarians help students find great information on any topic and provide training in using a wide range of resources. For contact details of faculty liaison librarians, see [www.library.usyd.edu.au/contacts/subjectcontacts.html](http://www.library.usyd.edu.au/contacts/subjectcontacts.html)

It is also possible to learn research and information skills online; see [www.library.usyd.edu.au/skills](http://www.library.usyd.edu.au/skills)

Phone: +61 2 9351 2993  
Website: [www.library.usyd.edu.au](http://www.library.usyd.edu.au)

## Mathematics Learning Centre

The Mathematics Learning Centre helps undergraduate students to develop the mathematical knowledge, skills and confidence that are needed for studying first-level mathematics or statistics units at university. The centre runs bridging courses in mathematics at the beginning of the academic year (fees apply). The centre also provides ongoing support to eligible students during the year through individual assistance and small group tutorials.

For details of activities and online resources provided by the centre see the centre's website.

Level 4, Carslaw Building, F07  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 4061  
Fax: +61 2 9351 5797  
Email: [mlc@usyd.edu.au](mailto:mlc@usyd.edu.au)  
Website: [www.usyd.edu.au/mlc](http://www.usyd.edu.au/mlc)



## Museums and galleries

The University of Sydney has one of the largest and finest university collections of antiquities, art, ethnography and natural history in Australia. While these collections are used for teaching, they also provide an opportunity for the University to contribute to the cultural life of the country.

### University Art Gallery

Founded in the 1860s, the University of Sydney Art Collection now holds more than 7000 paintings, sculptures and works on paper by Australian, Asian and European artists, as well as more than 700 works from the University Union Art Collection. One of the most significant collections derives from the John Wardell Power Bequest. The gallery showcases changing exhibitions of works from the collection as well as high-quality exhibitions of both contemporary and historical works.

War Memorial Arch  
The Quadrangle, A14  
Camperdown Campus

Phone: +61 2 9351 6883  
Fax: +61 2 9351 7785  
Website: [www.usyd.edu.au/museums](http://www.usyd.edu.au/museums)

### Macleay Museum

The Macleay Museum originated with the 18th century collection of insects owned by Alexander Macleay. The oldest of its kind in Australia, the museum today holds significant collections of ethnographic artefacts, scientific instruments, biological specimens and historic photographs. Changing exhibitions engage with the diversity of the collection.

Macleay Building, A12  
Gosper Lane (off Science Road)  
Camperdown Campus

Phone: +61 2 9036 5253  
Fax: +61 2 9351 5646  
Email: [macleaymuseum@usyd.edu.au](mailto:macleaymuseum@usyd.edu.au)  
Website: [www.usyd.edu.au/museums](http://www.usyd.edu.au/museums)

### Nicholson Museum

The Nicholson Museum contains the largest and most prestigious collection of antiquities in Australia. It is also the country's oldest university museum, and features works of ancient art and objects of daily life from Greece, Italy, Egypt, Cyprus, the Near and Middle East, as well as Northern Europe. A regular changing schedule of exhibitions highlights various parts of the collection.

The Quadrangle, A14  
Camperdown Campus

Phone: +61 2 9351 2812  
Fax: +61 2 9351 7305  
Email: [nicholsonmuseum@usyd.edu.au](mailto:nicholsonmuseum@usyd.edu.au)  
Website: [www.usyd.edu.au/museums](http://www.usyd.edu.au/museums)

### The Tin Sheds Gallery

The Tin Sheds Gallery is part of the Art Workshop complex within the University of Sydney's Faculty of Architecture, Design and Planning. The gallery hosts exhibitions across a wide variety of contemporary visual arts practices from individuals and groups, as well as community projects and curated exhibitions.

Tin Sheds Gallery and Art Workshops  
Faculty of Architecture  
Wilkinson Building, G04

Phone: +61 2 9351 3115  
Fax: +61 2 9351 4184  
Email: [tinsheds@arch.usyd.edu.au](mailto:tinsheds@arch.usyd.edu.au)  
Website: [www.arch.usyd.edu.au/art\\_workshop.shtml](http://www.arch.usyd.edu.au/art_workshop.shtml)

## MyUni Student Portal

The MyUni student portal (<http://myuni.usyd.edu.au>) is the starting point and 'one-stop' environment for students to access all their web-based University information and services.

MyUni automatically tailors what a student sees based on their login and offers personalisation options.

MyUni enables students to access:

- student administration systems for obtaining examination results, enrolment and variations, timetabling, email services and links to courses and unit of study information
- the University's e-learning tools
- library services
- important messages and student alerts
- information and communications technology and support services
- campus maps, with descriptions of cultural, sporting and campus facilities.

## Orientation and O-Week

### Orientation

Starting university study brings both opportunities and challenges. A successful transition is important in developing a sense of belonging and better academic adjustment and success. The University of Sydney seeks to facilitate students' successful transition through a wide range of programs and activities.

Orientation activities for both undergraduate and postgraduate students are scheduled at the beginning of each semester. Transition support continues throughout the academic year within faculties, while student support services are available to help students throughout their study.

For more information visit  
[www.usyd.edu.au/current\\_students/orientation](http://www.usyd.edu.au/current_students/orientation)

### Undergraduate students

In the week before Semester One, the Sydney Welcome Orientation and Transition (SWOT) program offers all commencing undergraduate students an opportunity to learn more about the University of Sydney.

During this week you can get to know the University, develop key skills for success, discover other key resources for getting the most out of university life and develop a sense of belonging. All students are welcome to attend activities, which are based at the Camperdown and Darlington campuses. Faculties based on other campuses also provide orientation activities and programs.

SWOT 2010 will run from **24 to 26 February 2010**.  
For more information, see [www.swot.usyd.edu.au](http://www.swot.usyd.edu.au)

### Postgraduate students

Postgraduate students are supported by their faculties in transitioning to postgraduate study at the University of Sydney.

For more information visit  
[www.usyd.edu.au/current\\_students/orientation](http://www.usyd.edu.au/current_students/orientation)

### O-Week

O-Week is the orientation event at the beginning of Semester One. Organised by the University of Sydney Union (USU) and other student organisations, it runs in parallel with the SWOT program. O-Week 2010 will run from **24 to 26 February 2010**.

For more information visit [www.usuonline.com](http://www.usuonline.com)

## Part-time, full-time attendance

### Undergraduate students

Undergraduate students are usually considered full time if they have a student load of at least 0.375 each semester. Anything under this amount is considered a part-time study load.

Note that some faculties have minimum study load requirements for satisfactory progress.

### Postgraduate students (coursework)

Part-time or full-time status for postgraduate coursework students is determined by credit-point load. Enrolment in units of study which total at least 18 credit points in a semester is classed as full time. Anything under this amount is a part-time study load.

Please note that classes for some coursework programs are held in the evenings (usually 6pm to 9pm).

### Postgraduate students (research)

Full-time candidates for research degrees do not keep to the normal semester schedule. Instead they work continuously throughout the year with a period of four weeks recreation leave.

There is no strict definition of what constitutes full-time candidature but if you have employment or other commitments that would prevent you from devoting at least the equivalent of a 35-hour working week to your candidature (including attendance at the University for lectures, seminars, practical work and consultation with your supervisor) you should enrol as a part-time candidate. If in doubt, consult your faculty or supervisor.

### International students

Student visa regulations require international students to undertake full-time study. International students on visas other than student visas may be permitted to study part-time.

## Policy Online

In addition to the resolutions covering specific courses, there are a number of University policies that apply to students. These include:

- Code of Conduct for students
- Academic Honesty in Coursework
- Student Plagiarism: Coursework Assessment and Examination of Coursework
- Identifying and Supporting Students at Risk.

All of these policies can be accessed at the University's Policy website ([www.usyd.edu.au/policy](http://www.usyd.edu.au/policy)).

## Printing service

The University Printing Service (UPS) provides printing and binding services including high-volume printing and copying, short run/low-volume printing, and four-colour process printing. It also offers finished artwork and design, including website design, document scanning, file conversion and CD burning.

UPS products range from stationery, books, brochures, handbooks, graduation certificates and examination papers through to invitations, flyers and banners.

UPS also offers a variety of finishing options plus collating, addressing and filling of envelopes, mail merge options and print-broking services.

University Printing Service  
Room 314, Level 3  
Services Building, G12  
Codrington Street

Phone: +61 2 9351 2004  
Fax: +61 2 9351 7757  
Email: [ups@ups.usyd.edu.au](mailto:ups@ups.usyd.edu.au)  
Website: [www.usyd.edu.au/ups](http://www.usyd.edu.au/ups)

## Privacy

The University is subject to the *NSW Privacy and Personal Information Protection Act 1998* and the *NSW Health Records and Information Privacy Act 2002*. Central to both pieces of legislation are the sets of information protection principles (IPPs) and health privacy principles which regulate the collection, management, use and disclosure of personal and health information.

In compliance with the *Privacy and Personal Information Protection Act* the University developed a *Privacy Management Plan* which includes the *University Privacy Policy*. The *Privacy Management Plan* sets out the IPPs and how they apply to functions and activities carried out by the University. Both the plan and the *University Privacy Policy* were endorsed by the Vice-Chancellor on 28 June 2000.

Further information and a copy of the plan may be found at [www.usyd.edu.au/arms/privacy](http://www.usyd.edu.au/arms/privacy)

Any questions regarding the *Freedom of Information Act*, the *Privacy and Personal Information Protection Act*, the *Health Records and Information Privacy Act* or the *Privacy Management Plan* should be directed to Archives and Records Management Services. See [www.usyd.edu.au/arms](http://www.usyd.edu.au/arms) for contact details.

## Research Office

The Research Office administers the major government-funded research scholarships to postgraduate research students. Details of these scholarships and many others may be obtained from [www.usyd.edu.au/ro/training](http://www.usyd.edu.au/ro/training)

The closing date for applications for Australian Postgraduate Awards (APA) and University of Sydney Postgraduate Awards (UPA) is October every year.

Applications for National Health and Medical Research Council (NHMRC) Postgraduate Research Scholarships usually close in mid-July. It is wise to check in advance the exact closing date.

Research Office  
Level 6, Jane Foss Russell Building, G02  
Phone: +61 2 8627 8112  
Email: [research.training@usyd.edu.au](mailto:research.training@usyd.edu.au)  
Website: [www.usyd.edu.au/ro/training](http://www.usyd.edu.au/ro/training)

## Revenue Services

Revenue Services provides information on HECS/fee payment methods and can confirm the receipt of payments. The office can also provide information on the steps necessary to obtain a refund. More details are available on its website (listed below).

Revenue Services (domestic students)  
Margaret Telfer Building, K07  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 5222  
Fax: +61 2 9114 0556  
Email: [feespay@usyd.edu.au](mailto:feespay@usyd.edu.au)  
Website: [www.finance.usyd.edu.au/revenue\\_income/fees.shtml](http://www.finance.usyd.edu.au/revenue_income/fees.shtml)

Cashier's Office (domestic and international student payments)  
Level 3, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia  
Office hours: 9am to 5pm, Monday to Friday

## Scholarships for undergraduates

The Scholarships and Prizes Office administers scholarships and prizes for undergraduate and postgraduate coursework degrees at the University of Sydney. To learn more, see the website.

Scholarships and Prizes Office  
Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8450  
Fax: +61 2 8627 8485  
Email: [scholarships.reception@usyd.edu.au](mailto:scholarships.reception@usyd.edu.au)  
Website: [www.usyd.edu.au/scholarships](http://www.usyd.edu.au/scholarships)

## Security Service

Security staff patrol the University's Camperdown and Darlington campuses 24 hours a day, seven days a week and are easily identified by their blue uniforms and distinguishing badges.

### Security Escort Service

The University's Security Escort Service may be booked by phoning 9351 3487. This service provides transportation around the Camperdown and Darlington campuses as well as to the nearest transport point at its edge (it generally operates after the security bus has ceased). The service is for security situations and is not designed for convenience use. Requests for this service will be prioritised against other security demands.

### Emergency contact

Phone: +61 2 9351 3333 (13333 from an internal phone)

### Enquiries

Phone: +61 2 9351 3487 or (toll-free within Australia) 1800 063 487  
Fax: +61 2 9351 4555  
Email: [security.admin@mail.usyd.edu.au](mailto:security.admin@mail.usyd.edu.au)  
Website: [www.facilities.usyd.edu.au/security](http://www.facilities.usyd.edu.au/security)

### Traffic

Phone: +61 2 9351 3336

### Lost property

Phone: +61 2 9351 5325

## Service Management, Information and Communications Technology (ICT)

ICT is responsible for the delivery of many of the computing services provided to students. Students can contact ICT by phoning the helpdesk on (02) 9351 6000, through the IT Assist website ([www.usyd.edu.au/ict/switch](http://www.usyd.edu.au/ict/switch)) or by visiting the staff at one of the University Access Labs. The location details of Access Labs can be found at [www.usyd.edu.au/ict/switch/locations](http://www.usyd.edu.au/ict/switch/locations)

The labs provide students free access to computers, including office productivity and desktop publishing software. Some services are available on a fee-for-service basis, such as internet access, printing facilities, and the opportunity for students to host their own non-commercial website.

Each student is supplied with an account, called a 'UniKey' account, which allows access to a number of services including:

- free email
- WebCT/elearning online resources
- access to the Internet from home or residential colleges
- facilities, such as exam results, enrolment variations and timetabling
- free courses in basic computing (such as MS Office, basic html and Excel), run by Access Lab staff in the week following orientation week. To register contact the Access Lab Supervisor on +61 2 9351 6870.

See [www.usyd.edu.au/ict/switch](http://www.usyd.edu.au/ict/switch) for more information on these services.

Service Management, Helpdesk  
University Computer Centre, H08  
Camperdown Campus

Phone: +61 2 9351 6000  
Fax: +61 2 9351 6004  
Email: [support@usyd.edu.au](mailto:support@usyd.edu.au)  
Website: [www.usyd.edu.au/ict/switch](http://www.usyd.edu.au/ict/switch)

## Special Consideration

In cases of illness or misadventure, students should complete an *Application for Special Consideration* form, accompanied by relevant documentation, such as medical certificates, and submit it to the relevant faculty office. The forms are available at faculty offices, the Student Centre, and online at [www.usyd.edu.au/current\\_students/student\\_administration/forms](http://www.usyd.edu.au/current_students/student_administration/forms)

### Exemption from re-attendance

Although you may have attended certain lectures or practical classes before, exemption from re-attendance is granted only in exceptional circumstances. In any case, you are required to enrol in all units of study in which you propose to take examinations, whether or not you have been granted leave of absence (or exemption) from re-attendance at lectures and/or practical work. To obtain exemption from re-attendance, apply at your faculty office.

## Staff and Student Equal Opportunity Unit (SSEOU)

The Staff and Student Equal Opportunity Unit works with the University community to promote equal opportunity in education and employment, to create opportunities for staff and students who have traditionally been disadvantaged by mainstream practices and policies, and to create an environment that is free from discrimination and harassment.

The Staff and Student Equal Opportunity Unit is responsible for:

- providing policy advice to staff on harassment and discrimination
- providing equal opportunity policy development, promotion and training for staff and students
- coordinating and monitoring equity programs and initiatives
- providing information and advice to staff and students on equal opportunity matters
- resolving individual staff and student concerns about harassment and discrimination
- overseeing the University's Harassment and Discrimination Resolution procedure
- monitoring and reporting to external bodies on the University's progress in the equal opportunity area.

Every student and staff member at the University of Sydney has the right to expect that their fellow students and colleagues behave in a way that reflects these key values, irrespective of background, beliefs or culture.

In addition, every student and employee has a right to expect from the University equitable practices that preserve and promote equal opportunity to access, participate, and excel in their chosen field.

Rooms 228 to 235  
The Demountables, H11  
Codrington Street  
Darlington Campus  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 2212  
Fax: +61 2 9351 3195  
Email: [admin@eeo.usyd.edu.au](mailto:admin@eeo.usyd.edu.au)  
Website: [www.usyd.edu.au/eeo](http://www.usyd.edu.au/eeo)

## Student administration and support

The University provides personal, welfare, administrative and academic support services to facilitate your success. Many factors can have an impact on your wellbeing while studying, and student services can help you to manage these more effectively.

For details of services and online resources provided, visit [www.usyd.edu.au/current\\_students](http://www.usyd.edu.au/current_students)

## Student Centre

The Student Centre is responsible for the central functions of UAC admissions, enrolments, HECS, class timetabling, student records, examinations and graduations. In addition to the above matters, general information and academic transcripts can be obtained at the counter of the Student Centre.

Level 3, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

General enquiries: +61 2 8627 8200  
Academic records: +61 2 8627 8200  
Handbooks: +61 2 8627 8200  
Fax: +61 2 8627 8279 or +61 2 8627 8284 (academic records)  
Email: [student.centre@usyd.edu.au](mailto:student.centre@usyd.edu.au)  
Email: [academic.records@usyd.edu.au](mailto:academic.records@usyd.edu.au)  
Website: [www.usyd.edu.au/current\\_students/student\\_administration](http://www.usyd.edu.au/current_students/student_administration)

## Student course material (online stores)

Students in several faculties can purchase course collateral through an online eStore (available on their faculty website). Course collateral includes laboratory coats, uniforms, safety boots and other equipment required for units of study. All items have been selected and approved by the faculty concerned to ensure they meet course requirements.

## Student identity cards

The student identity card functions as a library borrowing card, a transport concession card (when suitably endorsed) and a general identity card. The card must be carried at all times on the grounds of the University and must be shown on demand and taken to all examinations.

University Card Services  
Level 2, Fisher Library, F03  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 9351 2423  
Email: [university.cards@usyd.edu.au](mailto:university.cards@usyd.edu.au)  
website: [www.usyd.edu.au/card\\_centre](http://www.usyd.edu.au/card_centre)

## Sydney Summer School

Nine faculties at the University offer subjects from undergraduate and postgraduate degree programs during a Summer School program. As the University uses its entire quota of Commonwealth-supported places in Semesters One and Two, these units are full fee-paying for both local and international students and enrolment is entirely voluntary.

Summer School enables students to accelerate their degree progress, make up for a failed subject or fit in a subject which otherwise would not suit their timetables. New students may also gain an early start by completing subjects before they commence their degrees.

Three sessions are offered during the semester break (commencing in mid-December, the first week of January, and the third week of January) and normally run for up to six weeks (followed by an examination week). Details of the available subjects are on the Summer School website.

A smaller Winter School is also offered. It will commence on 28 June 2010 and run for three weeks (followed by an examination week). The Winter School offers both postgraduate and undergraduate subjects.

To find out information about subjects offered and to enrol, see the Summer School website: [www.summer.usyd.edu.au](http://www.summer.usyd.edu.au)

## SydneyTalent

SydneyTalent is a University initiative that offers course-related employment at market leading rates and with flexible hours. It connects students with meaningful roles in their chosen field of study, allowing them to develop vital professional skills and graduate with marketable career experience. With SydneyTalent, students are able to successfully manage the work-study balance while building for future success.

Level 5, Jane Foss Russell Building G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8000  
Fax: +61 2 8627 8630  
Email: [sydney.talent@usyd.edu.au](mailto:sydney.talent@usyd.edu.au)  
Website: [www.sydneytalent.com.au](http://www.sydneytalent.com.au)

## Sydney Welcome Orientation and Transition Program (SWOT)

The Sydney Welcome Orientation and Transition program (SWOT) offers a head start to commencing undergraduate students at the University, helping you to become familiar with the University and its student support services. The library and central student support services work together with faculties to provide the SWOT program.

SWOT 2010 runs from **24 to 26 February 2010**.  
For more information, see [www.swot.usyd.edu.au](http://www.swot.usyd.edu.au) or visit [www.usyd.edu.au/current\\_students/orientation](http://www.usyd.edu.au/current_students/orientation)

## The University of Sydney Foundation Program (USFP)

The University of Sydney provides a foundation program to international students as a preparation for undergraduate degrees at several Australian universities.

The program is conducted by Taylors College on behalf of Study Group Australia and the University of Sydney. It allows both first and second semester entry to undergraduate courses at the University of Sydney and other universities within Australia.

### Contact details

Phone: +61 2 8263 1888  
Fax: +61 2 9267 0531  
Email: [info@taylorscollege.edu.au](mailto:info@taylorscollege.edu.au)  
Website: [www.usyd.edu.au/foundationprogram](http://www.usyd.edu.au/foundationprogram)

### College address

The University of Sydney Foundation Program  
Taylors College  
965 Bourke St  
Waterloo NSW 2017  
Phone: +61 2 8303 9700  
Fax: +61 2 8303 9777

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## Timetabling Unit

The Timetabling Unit in the Student Centre is responsible for producing personalised student timetables which are available through MyUni. Semester One timetables are available 10 days before that semester begins. Semester Two timetables are available from the beginning of Semester One examinations.

Website:

[www.usyd.edu.au/current\\_students/student\\_administration/timetables](http://www.usyd.edu.au/current_students/student_administration/timetables)

## University Health Service (UHS)

The University Health Service provides a full experienced general practitioner service and emergency medical care to all members of the University community. You can consult a doctor either by appointment or on a walk-in basis (for more urgent matters only). The UHS bills Medicare or your overseas student health care provider (Worldcare or Medibank Private) directly for the full cost of most consultations.

Email: [i.marshall@unihealth.usyd.edu.au](mailto:i.marshall@unihealth.usyd.edu.au)

Website: [www.unihealth.usyd.edu.au](http://www.unihealth.usyd.edu.au)

Phone: +61 2 9351 3484

Fax: +61 2 9351 4110

## University Health Service (Wentworth)

Level 3, Wentworth Building, G01  
The University of Sydney  
NSW 2006 Australia

Opening hours: 8.30am to 5.30pm, Monday to Friday

Phone: +61 2 9351 3484

Fax: +61 2 9351 4110

## University Health Service (Holme)

Holme Building, A09  
Entry Level, Science Road  
The University of Sydney  
NSW 2006 Australia

Opening hours: 8.30am to 5.30pm, Monday to Friday

Phone: +61 2 9351 4095

Fax: +61 2 9351 4338



# Student organisations

## Students' Representative Council (SRC)

The Students' Representative Council represents, campaigns and advocates for undergraduate students throughout the University.

SRC caseworkers advise students on a range of issues, including academic appeals, Centrelink and Austudy, tenancy, harassment and discrimination. The solicitor (from Redfern Legal Centre) provides legal assistance and court representation. These services are free and confidential. The SRC also offers financial support in the form of emergency loans of up to \$50.

In addition, the SRC runs a second-hand bookshop that specialises in the purchase and sale of coursework textbooks. Among the publications produced by the SRC are the weekly student newspaper *Honi Soit*, the *Counter-Course Handbook* and the *O-Week Handbook*.

The SRC, which recently celebrated its 80th anniversary, is one of the oldest student organisations in Australia, and is run by and for students. It's a great way to get involved in student life. Officers elected to the student council campaign on issues that directly affect students, such as course cuts and assessments, fee increases, discrimination and welfare rights. They also advocate on social justice matters both within the University and throughout the wider community.

### SRC main office

Level 1, Wentworth Building (G01), City Road  
 Phone: +61 2 9660 5222  
 Fax: +61 2 9660 4260  
 Email: [help@src.usyd.edu.au](mailto:help@src.usyd.edu.au)  
 Email (*Honi Soit* editors): [editors@src.usyd.edu.au](mailto:editors@src.usyd.edu.au)  
 Website: [www.src.usyd.edu.au](http://www.src.usyd.edu.au)

Contact the main office for details of other campuses.

### The SRC Secondhand Bookshop

Level 3, Wentworth Building (G01), City Road  
 Phone: +61 2 9660 4756  
 Fax: +61 2 9660 4260  
 Email: [books@src.usyd.edu.au](mailto:books@src.usyd.edu.au)  
 Website: [www.src.usyd.edu.au](http://www.src.usyd.edu.au)

## Sydney University Postgraduate Representative Association (SUPRA)

SUPRA is an independent association which provides advice, advocacy and support services to postgraduate students. SUPRA is both the voice and safety net of these students, and represents their interests by:

- ensuring the representation of postgraduate views within the University and wider community
- providing free, confidential assistance and advocacy for postgraduates through the employment of Student Advice and Advocacy Officers (SAAOs)
- providing free legal advice for postgraduate students, in association with the Redfern Legal Centre
- representing postgraduates on University policymaking bodies such as the Academic Board, its committees and working parties
- meeting with members of the Senate on the Senate/Student Organisations Liaison Committee
- regularly consulting with the Vice-Chancellor, Registrar and other senior University officers
- drawing postgraduates together at all levels of University life.

## SUPRA Council, committees and networks

The SUPRA Council is elected annually by and from the postgraduate student community. Council meetings are held monthly and postgraduate students are encouraged to attend. SUPRA committees and networks help to coordinate activities and run campaigns, and are a great way to get involved. All postgraduates can stand for the council or attend any SUPRA events provided they are a SUPRA subscriber (see below).

### Advice and advocacy

SUPRA employs professional student advice and advocacy officers (SAAOs) to help postgraduate students with any academic or personal problems that may affect their study, such as:

- fee payment and administrative issues
- academic appeals and exclusions
- supervision problems
- tenancy issues
- Centrelink and financial assistance concerns
- harassment and discrimination.

This is a free and confidential service for all postgraduates at the University of Sydney. To access the SAAO service, you must be a SUPRA subscriber. It's free to subscribe and you can do it online, in the office, or when you see an SAAO. To find out more about the SAAO service, email [help@supra.usyd.edu.au](mailto:help@supra.usyd.edu.au)

### Publications

SUPRA places the highest priority upon communication, being responsive to postgraduates and encouraging maximum participation in SUPRA through the following publications:

- *eGrad*, a regular email bulletin
- *The Postgraduate Survival Manual*
- *Thesis Guide*
- our weekly double-page spread in *Honi Soit*, the student newspaper
- a range of handbooks, fact sheets and brochures.

Electronic versions are available at [www.supra.usyd.edu.au](http://www.supra.usyd.edu.au)

All of SUPRA's services, activities and publications are free to SUPRA subscribers. By subscribing, you also show your support for all the work that SUPRA does on your behalf. It's free to subscribe and you can sign up online or drop into the SUPRA offices and fill out a form.

### SUPRA Office

Raglan Street Building, G10  
 Corner Raglan Street and Abercrombie Street  
 Phone: +61 2 9351 3715 (local) or  
 Phone: 1800 249 950 (toll free within Australia)  
 Fax: +61 2 9351 6400  
 Email: [admin@supra.usyd.edu.au](mailto:admin@supra.usyd.edu.au)  
 Website: [www.supra.usyd.edu.au](http://www.supra.usyd.edu.au)

## University of Sydney Union (USU)

As the largest university union in Australia, the USU is a major provider of exciting cultural, social, political, and charitable activities, as well as quality on-campus food and retail services, entertainment, events and programs that service the entire university community.

The USU offers an array of programs to its members to promote cultural life on campus, including awards, grants and prizes in leadership, literature, debating, photography, film, drama, philanthropy,



music and art. The USU Debating Team is a formidable force, currently ranked first in the world, and the USU also funds the oldest continuing theatre group in Australia, the Sydney University Dramatic Society.

The USU keeps the campus alive with big-name gigs and exhilarating events held throughout the year at its bars Manning and Hermann's. Each year the USU holds major festivals and events such as O-Week, Beachball and the Verge Arts Festival.

For more information on USU, see [www.usuonline.com](http://www.usuonline.com)

## Access Card Benefits Program

The USU offers membership to its award-winning Access Benefits Program, your gateway to benefits and discounts at more than 55 selected food, retail and entertainment partners on and off campus, as well as access to USU's programs including internships, student positions and volunteering opportunities.

For more information, see [www.accessbenefits.com.au](http://www.accessbenefits.com.au)

## Clubs and societies

The USU funds, accommodates, trains and supports more than 200 clubs and societies – groups that USU members can join and operate to meet others with shared interests. Clubs and societies organise their own activities and events with funding from the USU. Being part of a club or society is the best way to connect, socialise, network and gain valuable skills, training and experience.

There are clubs and societies focused on politics, culture, the arts, the environment, religion, volunteering, faculties, games, hobbies and passions. If there isn't a club or society that suits your interests, the USU will help you start your own.

For more information, see the clubs and societies section of the USU website [www.usuonline.com](http://www.usuonline.com)

C&S Office  
University of Sydney Union  
Level 1, Manning House, Manning Road  
Phone: +61 2 9563 6161  
Email: [clubsandsocs@usu.usyd.edu.au](mailto:clubsandsocs@usu.usyd.edu.au)

## The USU Student Leadership Program

The USU offers a range of development opportunities for its student members, ranging from board director positions, club and society executives, festival directors, debate directors, editors, volunteers, and community portfolio convenors.

The USU's programs not only entertain, but teach and prepare participants for life beyond graduation. USU programs include mentoring, personal development, and leadership training, providing the opportunity to add a different dimension to your tertiary education.

For more details, see the 'Get Involved' section of [www.usuonline.com](http://www.usuonline.com)

## Sydney Uni Sport & Fitness

Sydney Uni Sport & Fitness invites you to enjoy a healthier University experience.

Get access to three world-class, on-campus facilities, over 40 different sports clubs, more than 30 dance, recreation and sport short courses, plus get involved in popular social sporting activities through our range of maximum value membership options.

The vast array of sports clubs for men and women ranges from AFL to water polo, with competitions ranging from local social competitions to nationwide leagues, all giving you the chance to improve your performance under the guidance of some of Australia's most accomplished coaches and sportspeople.

Purpose-built venues offer tennis and squash courts, rock-climbing, fitness equipment, a martial arts room and an Olympic-size heated swimming pool.

Check out the historic and panoramic sporting ovals, rowing sheds and a multipurpose facility at Tempe, and don't forget the on-campus Grandstand sports bar and restaurant.

Sydney Uni Sport & Fitness  
University Sports & Aquatic Centre  
Corner Codrington Street and Darlington Road  
Phone: +61 2 9351 4960  
Fax: +61 2 9351 4962  
Email: [admin@sport.usyd.edu.au](mailto:admin@sport.usyd.edu.au)  
Website: [www.susf.com.au](http://www.susf.com.au)

## Facilities

Sydney Uni Sport & Fitness has three main fitness centres.

### University Sports & Aquatic Centre

Corner Codrington Street and Darlington Road  
Darlington Campus  
Phone: +61 2 9351 4978  
Email: [nmrc@sport.usyd.edu.au](mailto:nmrc@sport.usyd.edu.au)

Facilities at the centre include:

- 50-metre heated Olympic swimming pool
- modern fitness centre
- group fitness studio
- RPM studio
- six synthetic tennis courts
- four squash courts
- multifunction sports hall
- health assessments and fitness testing
- personal training
- Sports Bistro & Mint Cafe.

### Arena Sports Centre and the Ledge Climbing Centre

Western Avenue  
Camperdown Campus  
Phone: +61 2 9351 8111  
Email: [arenaman@sport.usyd.edu.au](mailto:arenaman@sport.usyd.edu.au)

Facilities at the Arena Sports Centre and the Ledge Climbing Centre include:

- extensive weights training room
- yoga classes
- 8-metre-tall rock climbing walls
- bouldering facilities
- personal training
- multipurpose sports hall
- two squash courts
- sports clinic
- Ralph's Café.

### HK Ward Gymnasium

Between Ovals 1 and 2  
Camperdown Campus  
Phone: +61 2 9351 4988  
Email: [hk@sport.usyd.edu.au](mailto:hk@sport.usyd.edu.au)

Facilities at the gymnasium include:

- martial arts facility
- sports hall
- boxing ring and gymnasium
- group fitness studio
- boxercise and kickboxing classes
- ergometer training
- sports equipment hire.



# International students

The following information is for international students studying onshore on an Australian student visa.

## Completion within the expected duration

Education providers are required to ensure that international students complete their studies within the duration specified on the electronic Confirmation of Enrolment (eCoE). Extensions to a student's course duration are allowed only in limited circumstances (for example, for compassionate or compelling reasons, where an intervention strategy has been implemented or where there has been an approved leave of absence or suspension).

It is important students ensure they are on track to complete their studies within the expected duration, or that they have permission from their faculty to extend their duration.

## Satisfactory academic progress

Maintaining satisfactory course progress is a mandatory student visa condition. Education providers are required to monitor course progress, intervene where students are at risk of failing to achieve satisfactory course progress, notify students who fail to achieve satisfactory course progress, and report students who fail to achieve satisfactory course progress to the Department of Immigration and Citizenship (DIAC).

It is important that every student is aware of the progress rules for their course and participates in the intervention strategies implemented by their faculty. Exclusion from a course due to unsatisfactory progress can have serious implications for student visa holders including visa cancellation and restrictions on returning to Australia.

The University provides many avenues of support for students who are struggling academically. International students who experience any difficulties with their academic progress should consult their faculty, the international student advisers in the International Office or the counsellors in the International Student Support Unit (ISSU).

## Distance/web-based study

International students may undertake no more than 25 per cent of their total course by distance and/or online learning. Students must not enrol in exclusively distance or online study in any compulsory study period.

Students who are supported by United States Financial Aid are not permitted to undertake distance and/or online learning at any time during their course of study.

## Work permits

International students with a work permit are permitted to work for up to 20 hours per week during semester and full-time during the University's official holiday periods. Contact the international student advisers in the International Office for more information.

## Change of address

International students must notify the University of their residential address within seven days of arrival and notify any subsequent change of address within seven days. This should be done online via the University's MyUni student portal (<http://myuni.usyd.edu.au>).

## Sponsored students

Sponsored students need permission from their sponsors before transferring courses, suspending their studies or varying their study load. Students sponsored by the Australian Government (AusAID, Endeavour), or Asia Development Bank (ADB) should contact the International Office in the early stages of considering a change to their program.

## Suspension/discontinuation

The University is required to report to DIAC any international students who discontinue or suspend their studies. Students who suspend their studies for medical or compassionate reasons should contact the international student advisers in the International Office urgently.

## Health cover

The Australian Government requires that all international students and their families pay for health insurance in Australia through the Overseas Student Health Cover (OSHC) scheme. The University-preferred provider is OSHC Worldcare. The International Office will, on receipt of the student's first payment of tuition fees and the OSHC premium, pay the compulsory amount to OSHC Worldcare on their behalf.

OSHC provides free access to the University health service and public hospitals. Higher-level coverage (eg access to private hospitals coverage for spouse and family) is the student's responsibility. Alternatively, international students may arrange their own OSHC through an approved provider. You can find a list of approved OSHC providers by searching for 'OSHC' on the federal government's Department of Health and Ageing website: [www.health.gov.au](http://www.health.gov.au)

## The University of Sydney Foundation Program (USFP)

The University of Sydney offers its foundation program to international students as a preparation for undergraduate degrees at several Australian universities.

The Foundation Program is conducted by Taylors College on behalf of Study Group Australia and the University of Sydney. It allows both first and second semester entry to undergraduate courses at the University of Sydney and other Australian universities.

### The University of Sydney Foundation Program

Taylors College  
965 Bourke Street  
Waterloo NSW 2017

Phone: +61 2 8303 9700

Fax: +61 2 8303 9777

Email: [info@taylorscollege.edu.au](mailto:info@taylorscollege.edu.au)

Website: [www.usyd.edu.au/foundationprogram](http://www.usyd.edu.au/foundationprogram)



## International Office

The International Office provides advice and assistance with application, admission and enrolment procedures for international students. The International Office also includes units responsible for international marketing, government and student relations, international scholarships, including AusAID scholarships and administrative support for international financial aid programs, and compliance with government regulations related to international students.

The International Office also coordinates student exchange and study abroad programs, and other inter-institutional links. The Study Abroad and Exchange unit helps domestic and international students who wish to enrol in such programs.

### International Admissions and Customer Services

Level 4, Jane Foss Russell Building, G02  
The University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8300  
Future student enquiries: 1800 899 376 (domestic free call)  
Fax: +61 2 8627 8387  
Email: [info@io.usyd.edu.au](mailto:info@io.usyd.edu.au)  
Website: [www.usyd.edu.au/internationaloffice](http://www.usyd.edu.au/internationaloffice)

### Study Abroad

Phone: +61 2 8627 8322  
Fax: +61 2 8627 8390  
Email: [studyabroad@io.usyd.edu.au](mailto:studyabroad@io.usyd.edu.au)  
Website: [www.usyd.edu.au/studyabroad](http://www.usyd.edu.au/studyabroad)

### Student Exchange

Phone: +61 2 8627 8322  
Fax: +61 2 8627 8390  
Email: [studyabroad@io.usyd.edu.au](mailto:studyabroad@io.usyd.edu.au)  
Website: [www.usyd.edu.au/studentexchange](http://www.usyd.edu.au/studentexchange)

## International Student Support Unit

The International Student Support Unit (ISSU) provides support to international students through the provision of information, orientation programs, welfare advice and counselling.

The ISSU provides advice to international students on:

- preparations before leaving their home country
- what to expect upon arrival in Sydney
- emotional changes that can take place when moving to a different country
- academic concerns, including understanding the University system and liaising with staff members
- organising letters for family visits
- preparing to return to their home country.

The ISSU has two offices:

### Darlington Campus

Level 5, Jane Foss Russell Building, G02  
University of Sydney  
NSW 2006 Australia

Phone: +61 2 8627 8437  
Fax: +61 2 8627 8482  
Email: [info@issu.usyd.edu.au](mailto:info@issu.usyd.edu.au)  
Website: [www.usyd.edu.au/stuserv/issu](http://www.usyd.edu.au/stuserv/issu)

### Cumberland Campus

Ground Floor, A Block, C42  
75 East St, Lidcombe  
NSW 2141 Australia

Phone: +61 2 9351 9638  
Email: [ISSU.Cumberland@stuserv.usyd.edu.au](mailto:ISSU.Cumberland@stuserv.usyd.edu.au)  
Website: [www.usyd.edu.au/stuserv/issu](http://www.usyd.edu.au/stuserv/issu)

# Essential information for students

## Calendar

The annual *University of Sydney Calendar* and its online updates are the University of Sydney's central source of official information.

The *Calendar* provides general and historical information about the University of Sydney, the statutes and regulations under which it operates and the resolutions of the Senate relating to constitutions of and courses in each faculty. The statutes and regulations, as well as some resolutions of the Senate, are also available on Policy Online ([www.usyd.edu.au/policy](http://www.usyd.edu.au/policy)).

Along with the University of Sydney handbooks, the *Calendar* forms the official legal source of information relating to study at the University of Sydney.

The latest *Calendar* is available in hard copy from the Student Centre. It is also available online (at [www.usyd.edu.au/calendar](http://www.usyd.edu.au/calendar)). The PDF and Word document files can be downloaded and printed if required.

## Coursework Rule

It is very important that students are aware of the *University of Sydney (Coursework) Rule 2000*, which governs all coursework award courses in the University.

The Coursework Rule relates to:

- award course requirements
- credit points and assessment
- enrolment
- credit
- cross-institutional study and its upper limits
- progression
- discontinuation of enrolment and suspension of candidature
- unsatisfactory progress and exclusion
- exceptional circumstances
- award of degrees
- diplomas and certificates
- transitional provisions.

It should be read in conjunction with two other documents:

- The *University of Sydney (Amendment Act) Rule 1999*
- Senate resolutions and faculty resolutions relating to each award course (found in the relevant faculty handbook).

The Coursework Rule can be found in the following places:

- The *University of Sydney Calendar* (print or online version): [www.usyd.edu.au/calendar](http://www.usyd.edu.au/calendar)
- Policy Online: [www.usyd.edu.au/policy](http://www.usyd.edu.au/policy)
- Handbooks Online: [www.usyd.edu.au/handbooks/university\\_information/01\\_uni\\_coursework\\_rule](http://www.usyd.edu.au/handbooks/university_information/01_uni_coursework_rule)

## PhD Rule

The *University of Sydney (Doctor of Philosophy (PhD)) Rule 2004* deals with matters relating to the degree of Doctor of Philosophy, including admission, probation, supervision and submission of theses.

It should be read in conjunction with two other documents:

- The *University of Sydney (Amendment Act) Rule 1999*
- Senate and faculty resolutions relating to each award course (found in the relevant faculty handbook).

The PhD Rule can be found in the following locations:

- The *University of Sydney Calendar* (print or online version): [www.usyd.edu.au/calendar](http://www.usyd.edu.au/calendar)
- Policy Online: [www.usyd.edu.au/policy](http://www.usyd.edu.au/policy)
- Handbooks Online: [www.usyd.edu.au/handbooks/postgrad\\_hb/ap04\\_phd\\_rule.shtml](http://www.usyd.edu.au/handbooks/postgrad_hb/ap04_phd_rule.shtml)

## Plagiarism

The University of Sydney is opposed to and will not tolerate plagiarism. It is the responsibility of all students to:

- ensure that they do not commit or collude with another person to commit plagiarism
- report possible instances of plagiarism
- comply with the University's policy and procedure on plagiarism.

The policy and procedure on plagiarism can be found at the Policy Online website ([www.usyd.edu.au/policy](http://www.usyd.edu.au/policy)).

The Policy Online website also lists related policies and procedures, including:

- *Academic Honesty in Coursework (plagiarism) policy*
- *Code of Conduct for Responsible Research Practice and Guidelines for Dealing with Allegations of Research Misconduct.*

The University will treat all identified cases of student plagiarism seriously, in accordance with this policy and procedure, and with Chapter 8 of the *University of Sydney By-Law 1999 (as amended)*, which deals with student discipline.

## Students at Risk Policy

The Students at Risk Policy enables early detection of students who are making poor or unsatisfactory progress and are therefore at risk of exclusion from their degree.

The policy outlines procedures and processes to support students in their ongoing studies, including:

- timely intervention and the provision of advice and assistance
- regularly and effectively advising students of progress requirements
- identifying students at risk
- alerting students that they are at risk
- providing assistance to address the risk
- tracking the progress of students after they are identified as being at risk.

For more information on this policy, please see the Secretariat website ([www.usyd.edu.au/secretariat/students/riskstudents](http://www.usyd.edu.au/secretariat/students/riskstudents)).

## Grievance Procedure

The University's policy and procedures document on student grievances, appeals and applications for review is available on the Policy Online website ([www.usyd.edu.au/policy](http://www.usyd.edu.au/policy)).

The *Grievance Procedure* document is a statement of the University's processes for handling student grievances, appeals and applications for review regarding academic and non-academic matters.

Study at the University presents opportunities for interacting with other members of the University community. The University recognises and values the diversity of student experiences and expectations, and is committed to treating students, both academically and administratively, in a fair and transparent manner.





# Abbreviations

Listed below are commonly used acronyms that appear in University documents and publications. (See also the Glossary.)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A	
AARNet	Australian Academic Research Network
AAM	Australian Awards for University Teaching
AAUT	Annual Average Mark
ABC	Activity-based costing
ABSTUDY	Aboriginal Study Assistance Scheme
AC21	Academic Consortium 21
ACER	Australian Council for Educational Research
ALTC	Australian Learning and Teaching Council
ANZAAS	Australian and New Zealand Association for the Advancement of Science
APA	Australian Postgraduate Awards
APAC	Australian Partnership for Advanced Computing
APAI	Australian Postgraduate Awards (Industry)
APA-IT	Australian Postgraduate Awards in Information Technology
APDI	Australian Postdoctoral Fellowships Industry
APD	Australian Postdoctoral FellowshipAsia-Pacific Economic Cooperation
APEC	Asia-Pacific Economic Cooperation
APF	Australian Professorial Fellowship
APRU	Association of Pacific Rim Universities
AQF	Australian Qualifications Framework
ARC	Australian Research Council
ARTS	Automated Results Transfer System
ASDOT	Assessment Fee Subsidy for Disadvantaged Overseas Students
ATAR	Australian Tertiary Admissions Rank
ATN	Australian Technology Network
ATP	Australian Technology Park
AUQA	Australian Universities Quality Agency
AusAID	Australian Agency for International Development
AUTC	Australian Universities Teaching Committee
AWA	Australian Workplace Agreements

B	
BAA	Backing Australia's Ability
BITLab	Business Intelligence Lab

C	
CAF	Cost adjustment factor
CCE	Centre for Continuing Education
CDP	Capital Development Program
CEP	Country Education Profile
CEQ	Course Experience Questionnaire
CFO	Chief Financial Officer
CHESSN	Commonwealth Higher Education System Student Number
CIO	Chief Information Officer
CIS	Campus Infrastructure Services
COE	Confirmation of Enrolment
CPSU	Community and Public Sector Union
CR	Credit (grade)
CRC	Cooperative Research Centre
CREO	Centre for Regional Education, Orange

C	
CRICOS	Commonwealth Register of Institutions and Courses for Overseas Students
CRRRI	Centre for Rural and Regional Innovation
CSG	Cumberland Student Guild
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSP	Commonwealth Supported Place
CULT	Combined Universities Language Test
CUTSD	Committee for University Teaching and Staff Development

D	
D	Distinction (grade)
DAC	Data Audit Committee
DEEWR	Commonwealth Department of Education, Employment and Workplace Relations
DEST	Commonwealth Department of Education, Science and Training (now known as DEEWR)
DET	NSW Department of Education and Training
DIAC	Department of Immigration and Citizenship
D-IRD	Discovery-Indigenous Researchers Development Program
DOGS	Director of Graduate Studies
DVC	Deputy Vice-Chancellor

E	
EB	Enterprise bargaining
EFTSL	Equivalent full-time student load
EFTSU	Equivalent full-time student unit (replaced by EFSTL)
EIP	Evaluations and Investigations Program
ELICOS	English Language Intensive Course of Study
EMU	Electron Microscope Unit
ESOS Act	Education Services for Overseas Student Act

F	
F	Fail
FEE-HELP	Fee - Higher Education Loan Program
FlexSIS	Flexible Student Information System
FFT	Fractional full-time (equivalent staff)
FHS	Faculty of Health Sciences
FOS	Field of study
FTE	Full-time equivalent (staff)

G	
GATS	General Agreement on Trade in Services
GCCA	Graduate Careers Council of Australia
GDS	Graduate destination survey
Go8	Group of Eight
GPOF	General Purpose Operating Funds
GSA	Graduate Skills Assessment
GSG	Graduate School of Government
GWSLN	Greater Western Sydney Learning Network



## Abbreviations

<b>H</b>	
HD	High distinction
HDR	Higher degree research
HECS	Higher Education Contribution Scheme (replaced by HECS-HELP)
HECS-HELP	Higher Education Contribution Scheme - Higher Education Loan Program
HEEP	Higher Education Equity Program
HEIMS	Higher Education Information Management System
HEIP	Higher Education Innovation Program (DEEWR)
HELP	Higher Education Loan Program
HEO	Higher education officer
HEP	Higher education provider
HERDC	Higher Education Research Data Collection
HESA	Higher Education Support Act
HOA	Head of administrative unit
HOD	Head of department
HOS	Head of school

<b>I</b>	
IAF	Institutional Assessment Framework
IAS	Institute of Advanced Studies
ICT	Information and communication technology
IELTS	International English Language Testing Scheme
IGS	Institutional Grants Scheme (DEEWR)
IO	International Office
IP	Intellectual property
IPRS	International Postgraduate Research Scholarships
IREX	International Researcher Exchange Scheme
ISFP	Indigenous Support Funding Program
ISIG	Innovation Summit Implementation Group
ISSU	International Student Services Unit
ITL	Institute for Teaching and Learning

<b>J</b>	
JASON	Joint Academic Scholarships Online Network

<b>L</b>	
LBOTE	Language background other than English

<b>M</b>	
MISG	Management Information Steering Group
MNRF	Major National Research Facilities Scheme
MOU	Memorandum of understanding
MRB	Medical Rural Bonded Scholarship Scheme

<b>N</b>	
NBCOTP	National Bridging Courses for Overseas Trained Program
NCG	National Competitive Grant
NESB	Non-English-speaking background
NHMRC	National Health and Medical Research Council
NOIE	National Office for the Information Economy
NOOSR	National Office for Overseas Skill Recognition
NRSL	Non-recent school leaver
NSW VCC	New South Wales Vice-Chancellors' Conference
NTEU	National Tertiary Education Industry Union
NUS	National Union of Students

<b>O</b>	
OECD	Organisation for Economic Cooperation and Development
OLA	Open Learning Australia
OPRS	Overseas Postgraduate Research Scholarships

<b>O</b>	
OS-HELP	Overseas Student - Higher Education Loan Program

<b>P</b>	
P	Pass
PCON	Pass (Concessional)
PELS	Postgraduate Education Loans Scheme
PSO	Planning Support Office
PVC	Pro-Vice-Chancellor

<b>Q</b>	
QA	Quality assurance
QACG	Quality Advisory and Coordination Group

<b>R</b>	
R&D	Research and development
R&R	Restructuring and Rationalisation Program
RC	Responsibility Centre
REG	Research and earmarked grants
REP	Research Education Program
RFM	Relative Funding Model
RIAP	Research Institute for Asia and the Pacific
RIBG	Research Infrastructure Block Grant (DEEWR)
RIEF	Research Infrastructure Equipment and Facilities Scheme
RIMS	Research Information Management System
RISF	Restructuring Initiatives Support Fund
RMO	Risk Management Office
ROA	Record of Achievement
RQ	Research Quantum
RQF	Research Quality Framework
RQU	Recognition Quality Unit (Higher Education Division, DEEWR)
RRTMR	Research and Research Training Management Reports
RSL	Recent school leaver
RTS	Research Training Scheme (DEEWR)

<b>S</b>	
SASCA	Student Association of Sydney College of the Arts
SCA	Sydney College of the Arts
SCEQ	Sydney Course Experience Questionnaire
SCM	Sydney Conservatorium of Music
SCR	Science Capability Review
SDF	Strategic Development Fund
SEG	Senior Executive Group
SES	Socioeconomic status
SI	Scholarship Index
SLE	Student Learning Entitlement
SNA	Safety net adjustment
SPR	Student Progress Rate
SRC	Students' Representative Council
SSP	Special Studies Program
SSR	Student-staff ratio
STABEX	Study Abroad Exchange (database)
SUPRA	Sydney University Postgraduate Representative Association
SUSF	Sydney Uni Sport & Fitness

<b>T</b>	
TAFE	Technical and Further Education
TOEFL	Test of English as a foreign language
TPI	Teaching performance indicator

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<b>U</b>	
UAC	Universities Admissions Centre
UAI	Universities Admission Index (replaced by ATAR)
UMAP	University Mobility in Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNSW	University of New South Wales
UPA	University Postgraduate Awards
USU	University of Sydney Union
UTS	University of Technology, Sydney

<b>V</b>	
VCAC	Vice-Chancellor's Advisory Committee
VET	Vocational Education and Training
VSU	Voluntary Student Unionism

<b>W</b>	
WAM	Weighted Average Mark
WRP	Workplace Reform Program
WTO	World Trade Organization

<b>Y</b>	
YFE	Year of first enrolment





# Glossary

For a table of commonly used acronyms and abbreviations that appear in University documents and publications, see Abbreviations.

This glossary describes terminology in use at the University of Sydney.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

## A

### Academic Board

The senior academic body within the University. The Academic Board has, as principal responsibility, to maintain the highest standards in teaching, scholarship and research at the University and advises Senate and the Vice-Chancellor in that regard. In conjunction with faculties, the Academic Board has responsibility for approving new or amended courses and endorsing faculty development of units of study. The Board is also responsible for the formulation and review of policies, guidelines and procedures in relation to academic matters. For further information, see the *University of Sydney (Academic Governance) Rule 2003 (as amended)*.

### Academic Consortium 21 (AC21)

An international network, of which the University is a member, which comprises educational, research and industrial organisations throughout the world with the objective of encouraging the further advancement of global cooperation to the benefit of higher education and to contribute to world and regional society.

### Academic cycle

The program of teaching sessions offered over a year. Currently the cycle runs from the enrolment period for Semester One to the completion of the processing of results at the end of Semester Two. See also 'Academic year', 'Stage'.

### Academic dishonesty

Academic dishonesty occurs when one person presents another person's ideas, findings or written work as his or her own by copying or reproducing them without due acknowledgement of the source and with intent to deceive. Academic dishonesty also covers recycling, fabrication of data, engaging another person to complete an assessment or cheating in exams. See also 'Plagiarism'.

### Academic record

The complete academic history of a student at the University. It includes, among other things: personal details; all units of study and courses taken; assessment results (marks and grades); awards and prizes obtained; infringements of progression rules; approvals for variation in course requirements and course leave; thesis and supervision details.

Access to a student's academic record is restricted to authorised University staff and is not released to a third party without the written authorisation of the student. See also 'Academic transcript'.

### Academic transcript

A printed statement setting out a student's academic record at the University. There are two forms of academic transcript: external and internal. See also 'Academic record', 'External transcript', 'Internal transcript'.

### Academic year

The current calendar year in which a student is enrolled. See also 'Academic cycle', 'Stage'.

### *Ad eundem gradum*

Long-standing full-time members of the University's academic and general staff who are not graduates of the University may be considered by Senate, upon their retirement, for admission *Ad eundem gradum* ('to the same degree') to an appropriate degree of the University.

### Admission

Governed by the University's admission policy, this is the process for identifying applicants eligible to receive an initial offer of enrolment in a course at the University. Admission to most undergraduate courses is based on performance in the HSC, with applicants ranked on the basis of their Australian Tertiary Admissions Rank (ATAR).

Other criteria such as a portfolio, interview, audition, or results in standard tests may also be taken into account for certain courses. Admission to postgraduate courses is normally on the basis of performance in a prior undergraduate degree and other criteria as specified in the relevant degree resolutions.

### *Admission basis*

The main criterion used by a faculty in assessing an application for admission to a course. The criteria used include, among other things, previous secondary, TAFE or tertiary studies, work experience, special admission, and the Australian Tertiary Admissions Rank (ATAR).

### *Admission (Deferment)*

An applicant who receives an offer of admission to a course may apply to defer enrolment in that course for one semester or one academic cycle. (Note: this policy is currently under review.)

### *Admission mode*

A classification based on how a student was admitted to a course, for example 'UAC' or 'direct'.

### *Admission period*

The period during which applications for admission to courses are considered.

### *Admission year*

The year the student expects to begin the course. See also 'Commencement date'.

### Advanced diplomas

See 'Course'.

### Advanced standing

See 'Credit'.

### Aegrotat

In exceptional circumstances involving serious illness or death of a student prior to completion of their course, the award of an aegrotat, or posthumous degree or diploma, may be conferred.

### Alumni

See 'Graduate'.

### Alumni sidneiensis

A searchable database of graduates of the University from 1857 to approximately 30 years prior to the current year.



**Annual average mark (AAM)**

The average mark over all units of study attempted in a given academic year (equivalent to the calendar year). The formula for this calculation is:

$$AAM = \frac{\sum (\text{marks} \times \text{credit point value})}{\sum (\text{credit point value})}$$

(Sums over all units of study completed in the selected period.)

The mark is the actual mark obtained by the student for the unit of study, or in the case of a failing grade with no mark – 0. Pass/fail assessed subjects and credit transfer subjects (from another institution) are excluded from these calculations. However, the marks from all attempts at a unit of study are included.

**Annual progress report**

A form used to monitor a research student's progress each year. The form provides for comments by the student, the supervisor, the head of the department and the dean (or their nominee). The completed form is attached to the student's official file.

**Annual Report**

The University's yearly financial and audit report, submitted to the NSW Parliament. It also includes a broad range of the University's activities and the strength of their performance in relation to the University's stated roles, values and goals.

**Appeals**

Students may lodge an appeal against academic or disciplinary decisions. See also 'Student Appeals Body', 'Student Disciplinary Appeals Committee'.

*Appeals against an academic decision*

A student may appeal to the Student Appeals Body against a decision by the University that affects the academic assessment or progress of a student within his or her award course, including a decision:

- (a) to exclude a student in accordance with the *University of Sydney (Coursework) Rule 2000 (as amended)*
- (b) not to readmit or re-enrol a student following exclusion in accordance with the *University of Sydney (Coursework) Rule 2000 (as amended)*
- (c) to terminate a student's candidature for a postgraduate award.

*Appeal against a disciplinary decision*

A student may appeal to the Student Disciplinary Appeals Committee against a determination being:

- (a) a finding by the Vice-Chancellor or the Student Proctorial Board that the student is guilty of misconduct
- (b) the imposition of a penalty upon the student by the Vice-Chancellor or the Student Proctorial Board
- (c) an order made by the Vice-Chancellor or the Student Proctorial Board.

**Assessment**

The process of measuring the performance of students in units of study and courses. Performance may be assessed by examinations, essays, laboratory projects, assignments, theses, treatises or dissertations. See also 'Result processing'.

*Formative assessment*

Used principally to provide students with feedback on their progress in learning. It reinforces successful learning, and is an opportunity for students to expose the limits in their knowledge and understanding.

*Summative assessment*

Summative assessment is used to certify competence, or to rank students by order of merit. It certifies the attainment of a standard, and is used as the basis for progression to the next part of a program, or to graduation.

**Associate supervisor**

A person who is appointed in addition to the supervisor of a research student to provide particular expertise or additional experience in supervision. See also 'Instrumental supervisor/teacher', 'Research supervisor', 'Supervision'.

**Association of Pacific Rim Universities (APRU)**

A consortium of leading research universities in the Pacific Rim, of which the University is a member. APRU aims to foster education, research and enterprise, thereby contributing to economic, scientific and cultural advancement in the Pacific Rim.

**Assumed knowledge**

For some units of study, a student is assumed to have passed a relevant subject in the HSC – this is called assumed knowledge. While students are generally advised against taking a unit of study for which they do not have the assumed knowledge, they are not prevented from enrolling in that unit of study. See also 'Prerequisite'.

**Attendance mode or attendance pattern**

The attendance pattern for a course is full-time, part-time or external, depending on the student attendance requirements and student load.

**Australian Qualifications Framework (AQF)**

The framework for recognition and endorsement of qualifications established by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).

**Australian Tertiary Admissions Rank (ATAR)**

A measure of overall academic achievement in the HSC that helps universities rank applicants for university selection. The ATAR is a rank of any student's performance relative to other students. It is calculated from the aggregate of scaled marks in 10 units of the HSC (two best English units plus eight other units, including only two category B units) and is presented as a number between 0.00 and 99.95 with increments of 0.05. The ATAR replaced the Universities Admissions Index (UAI) in June 2009.

**Austudy**

Provides financial help to students who are 25 years old or over who meet the required criteria, and are undertaking an approved full-time course at an approved institution. See also 'Youth allowance'.

**Automated Results Transfer System (ARTS)**

This system was developed by the Australasian Conference of Tertiary Admissions Centres (ACTAC) to allow access to a student's electronic academic record, via an admission centre or tertiary institution.

**B****Bachelor's degree**

The highest undergraduate award offered at the University. A bachelor's degree course normally requires three or four years of full-time study or the part-time equivalent. See also 'Course'.

**Board of studies**

An academic body that supervises a course or courses, and is similar to a faculty except that it is headed by a chair rather than a dean.

**Bursaries**

Financial award made to a student, based primarily on need. See also 'Scholarships'.

## C

**Cadigal program**

A program, named in recognition of the Aboriginal people of the land on which the University is located, designed to increase the successful participation of Aboriginal and Torres Strait Islander people in degree courses in all faculties at the University of Sydney.

**Calendar**

See 'University Calendar'.

**Campus**

The grounds on which the University is situated. There are 10 campuses of the University of Sydney:

- Burren Street (Institute for International Health, Institute of Transport and Logistics Studies)
- Camperdown and Darlington (formerly known as Main Campus)
- Camden (Agriculture, Food and Natural Resources; and Veterinary Science)
- Conservatorium (Sydney Conservatorium of Music)
- Cumberland (Health Sciences)
- Mallett Street (Nursing and Midwifery)
- Rozelle (Sydney College of the Arts)
- St James (Law teaching spaces)
- Surry Hills (Dentistry).

**Cancellation of enrolment**

The University may cancel a student's enrolment for non-payment of fees.

**Candidature**

A person is 'admitted to candidature' on the date on which he or she accepts the University's offer of admission to an award course, in accordance with University and government requirements as amended from time to time. There are maximum periods and in some cases minimum periods of candidature depending on the award course and whether the candidate is a full-time or part-time student.

**Census date**

The date at which a student's enrolment, load and HECS liability are finalised before this information is reported to DEEWR. See also 'Commonwealth Supported Place', 'HECS-HELP'.

**Ceremony**

See 'Graduation ceremony'.

**Chancellor**

The non-executive head of the University. An honorary position, the Chancellor presides over meetings of the University's governing body, the Senate, and important ceremonial occasions such as graduations.

**Clinical experience**

Students undertake clinical placements in a professional environment as part of their course requirements. Many require University-approved supervision. In order to undertake clinical placements a student may be required to fulfil additional requirements.

**Combined degree**

A single program with a single set of course resolutions leading to the award of two degrees (unless otherwise specified in the resolutions). See also 'Double degree'.

**Commencement date**

The date a student commences their candidature.

**Commonwealth Supported Place (CSP)**

(Previously known as a HECS Place.) A student in a Commonwealth Supported Place makes a contribution towards the cost of their education (known as the student contribution) while the Australian Government contributes the majority of the cost.

**Confirmation of Enrolment notice (COE)**

This notice is issued to each student after enrolment, showing the course and the units of study in which the student is enrolled, together with the credit point value of the units of study and the

student-contribution weights. Until all fees are paid, it is issued provisionally. A new confirmation of enrolment notice is produced every time a student's enrolment is varied.

**Conjoint ventures**

This is when two or more institutions cooperate to provide a unit or course of study to postgraduate coursework students. In these arrangements, students enrolled for a degree at one institution complete one or more units of study at the other institution to count towards the award program at their 'home' institution.

**Continuing professional education**

A process which provides a number of programs of continuing education courses for professionals as they move through their career. These programs are currently administered by the Centre for Continuing Education (CCE) and a number of departments and foundations across the University. This process supports the whole of life learning concept and involves the maintenance of a long-term relationship between the student and the University.

**Convocation**

A body that comprises: the Fellows and former Fellows of the Senate of the University of Sydney; members of the former governing bodies of the institutions with which the University has amalgamated or their predecessors; the graduates of the University of Sydney, including graduates of the institutions with which the University has amalgamated or their predecessors; professors and other full-time members of the academic staff of the University; and principals of the incorporated colleges.

**Core unit of study**

A unit of study that is compulsory for a particular course or subject area. See also 'Unit of study'.

**Corequisite**

A unit of study that must be taken in the same semester or year as a given unit of study (unless it has already been completed). These are determined by the faculty or board of studies concerned, published in the faculty handbook and shown in FlexSIS. See also 'Prerequisite', 'Waiver'.

**Cotutelle Scheme**

Agreement between the University and any overseas university for joint supervision and examination of a PhD student as part of an ongoing cooperative research collaboration. If successful, the student receives a doctorate from both universities with each testamur acknowledging the circumstances under which the award was made.

**Course**

A program of study at the University of Sydney. The main types of course are:

*Award course*

A formal course of study that will see attainment of a recognised award. Award courses are approved by Academic Board and endorsed by Senate. The University broadly classifies courses as undergraduate, postgraduate coursework or postgraduate research. See also 'Bachelor's degree', 'Course rules', 'Diploma', 'Doctorate', 'Major', 'Master's degree', 'Minor', PhD, 'Stream'.

*Non-award course*

Studies undertaken by students that do not lead to an award from the University. Non-award courses include professional development programs. See also 'Cross-institutional enrolment'.

*Coursework*

An award course not designated as a research award course. While the program of study in a coursework award course may include a component of original work, other forms of instruction and learning will normally be dominant.

**Research**

A course in which at least 66 per cent of the overall course requirements involve students undertaking supervised research over a prescribed period of time, leading to the production of a thesis or other piece of written or creative work.

**Course alias**

A unique five character alpha-numeric code which identifies a University course.

**Course code**

See 'Course alias'.

**Course leave**

Students are permitted to apply for a period away from their course without losing their place. Course leave is formally approved by the supervising faculty for a minimum of one semester. Students on leave are regarded as having an active candidature, but they are not entitled to a student card. At undergraduate level, leave is not counted towards the total length of the course. Students who are absent from study without approved leave may be discontinued and may be required to formally reapply for admission. See also 'Progression'.

**Course rules**

Rules that govern the allowable enrolment of a student in a course. Course rules may be expressed in terms of types of units of study taken, length of study, and credit points accumulated. For example, a candidate may not enrol in units of study that have a total value of more than 32 credit points per semester.

Course rules also govern the requirements for the award of the course. For example, in many cases a candidate must complete a minimum of 144 credit points. See also 'Course', 'Corequisite', 'Prerequisite'.

**Course transfer**

Applies to students transferring between courses, either within the University of Sydney or between institutions. In some circumstances a student may be eligible to transfer to a course directly, ie without reapplying for admission.

**Credit**

The recognition of previous studies successfully completed at the University of Sydney (or another university or tertiary institution recognised by the University of Sydney), as contributing to the requirements of the course to which the applicant requesting such recognition has been admitted. It may be granted as specified credit or non-specified credit.

**Specified credit**

The recognition of previously completed studies as directly equivalent to units of study.

**Non-specified credit**

A 'block credit' for a specified number of credit points at a particular level. These credit points may be in a particular subject area but are not linked to a specific unit of study. See also 'Annual average mark (AAM)', 'Waiver', 'Weighted average mark (WAM)'.

**Credit points**

The value of the contribution each unit of study provides towards meeting course completion requirements. Each unit of study normally has a six credit point value assigned to it. The total number of credit points required for completion of award courses will be specified in the Senate resolutions relevant to the award course.

**Cross-institutional enrolment**

Enrolment in units of study to count towards an award course at another university. See also 'Course (Non-award course)'.

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**D****Data Audit Committee (DAC)**

The Data Audit Committee's role is to oversee the integrity and accuracy of the course and unit of study data as strategic University data. It also advises the Academic Board on suggested policy changes related to course and unit of study data. A subcommittee of the VCAC Enrolment Working Party, it is chaired by the Registrar, with membership including the deans, the Student Centre, FlexSIS and Planning and Statistics.

**Deadlines (Enrolment variations)**

See 'Enrolment variation'.

**Deadlines (Fees)**

The University has deadlines for the payment of course and other fees. Students who do not pay fees by these deadlines may have their enrolment cancelled or they may have a barrier placed on the release of their record. See also 'Cancellation of enrolment'.

**Dean**

The head of a faculty, or the principal/director of a college, such as the Sydney Conservatorium of Music, or Sydney College of the Arts.

**Dean's Certificate**

A statement from a faculty dean certifying that all requirements, including fieldwork and practical work, have been met and that the student is eligible to graduate. Not all faculties use Dean's Certificates. In faculties that do, qualified students have 'Dean's Certificate' noted on their academic record.

**Deferment (Deferral)**

See also 'Admission (Deferment)', 'Course leave'.

**Degree**

See also 'Bachelor's degree', 'Course'.

**Delivery mode**

Indicates how students receive the instruction for a unit of study. The delivery mode must be recorded for each unit as distinct from the attendance mode of the student. For example, an internal student may take one or more units by distance mode and an external student may attend campus for one or more units.

**Distance education**

Where subject matter is delivered in a more flexible manner, such as correspondence notes, a student may only attend campus if required. See also 'Distance education', 'Extended semester', 'International student (Offshore studies)'.

**Intensive on-campus**

Core content is delivered with support learning in an intensive (one or more days) format on campus. Participation is usually compulsory. Previously this may have been called residential, block mode, or weekend workshop.

**On-campus (normal)**

Attendance of scheduled lectures, tutorials etc at a campus of the University.

**Department**

A department is the academic unit responsible for teaching and examining a unit of study. It may be called a school, a department, a centre or a unit within the University. See 'School'.

**Department of Education, Employment and Workplace Relations (DEEWR)**

The federal government department responsible for higher education.

**Department of Education, Science and Training (DEST)**

Previous name of the federal government department now known as DEEWR.

**Diploma**

The award granted following successful completion of diploma course requirements. A diploma course usually requires less study than a degree course. See also 'Course'.

**Direct admissions**

For some courses, applications may be made directly to the University. Applications are received by faculties or the International Office, and considered by the relevant department or faculty body. Decisions are recorded and letters are forwarded to applicants advising them of the outcome. See also 'Admission', 'Universities Admissions Centre'.

**Disability information**

Students may inform the University of any temporary or permanent disability which affects their life as a student. Disability information is recorded but is only available to authorised users because of its sensitive nature. Students will be informed about how it is used.

**Disciplinary action**

Undertaken as the result of academic or other misconduct, for example plagiarism, cheating, security infringement, criminal activity.

**Discipline**

A defined area of study, such as chemistry, physics or economics.

**Discipline group**

A DEEWR code used to classify units of study in terms of the subject matter being taught or being researched.

**Discontinuation (course)**

See 'Enrolment variation'.

**Discontinuation (unit of study)**

See 'Enrolment variation'.

**Dissertation**

A written exposition of a topic which may include original argument substantiated by reference to acknowledged authorities. It is a required unit of study for some postgraduate award courses in the faculties of Law, and Architecture, Design and Planning.

**Distance education**

Where a student does not attend campus on a daily basis for a given course or unit of study. See also 'Delivery mode', 'Extended semester'.

**Doctorate**

A high-level postgraduate award. A doctorate course may involve research only or a mixture of research and coursework; the candidate submits a thesis that is an original contribution to the field of study. See also 'Course', 'PhD'.

**Domestic student**

A student who is not an international student. See also 'Local student'.

**Double degree**

A double degree is a program where students are permitted by participating faculties (and/or by specific resolutions within a single award) to transfer between courses in order to complete two awards.

**Downgrade**

In some circumstances a student enrolled in a PhD may transfer to a master's by research, either on the recommendation of the University on the basis that the research they are undertaking is not at an appropriate level for a PhD, or at the student's own request for personal or academic reasons.

**E****Elective**

A unit of study within a degree, usually an option within a course. Electives allow more detailed study of a particular subject.

**Embedded courses**

Award courses in the graduate certificate, graduate diploma and master's degree by coursework sequence which allow unit of study credit points to count in more than one of the awards, for example the Graduate Certificate in Information Technology, Graduate Diploma in Information Technology, and Master of Information Technology.

**Enrolled student**

A person enrolled in an award course of the University.

**Enrolment**

Refers to a period of time in a student's candidature. This period:

- (a) commences at the time the student has complied with all government and University requirements for enrolment
- (b) unless the student re-enrols, ceases at the date on which:
  - i. the University cancels, or the student withdraws from or discontinues enrolment; or
  - ii. the next new enrolment period commences.

A student enrolls in a course by registering with the supervising faculty in the units of study or program of research to be taken in the coming year, semester or session.

*Commencing*

An enrolment is classified as commencing if a student has enrolled in a particular degree or diploma for the first time.

*Continuing*

Students already in a course at the University re-enrol each year or semester. Most continuing students are required to pre-enrol. See also 'Pre-enrolment'.

*Enrolment list*

A list of all currently enrolled students in a particular unit of study. See also 'Unit of study'.

**Enrolment variation**

Students may vary their enrolment at the start of each semester. Each faculty determines its deadlines for variations, but student-contribution liability depends on the Commonwealth census date. See also 'Commonwealth Supported Place'.

**Equivalent full-time student load (EFTSL)**

The equivalent full-time student load for a year. It represents the annual study load of a student undertaking a particular course of study on a full-time basis.

**Equivalent full-time student unit (EFTSU)**

See 'Equivalent full-time student load'

**Examination**

A set of questions or exercises evaluating on a given subject given by a department or faculty. See also 'Assessment', 'Examination period'.

**Examination period**

The time set each semester for the conduct of formal examinations.

**Examiner (Coursework)**

The person assessing a student or group of students, for example through oral or written examinations, coursework assignments, and presentations.

**Exchange student**

Either a University of Sydney student participating in a formally agreed program involving study at an overseas university, or an overseas student studying here on the same basis. The International Office provides administrative support for some exchanges.

**Exclusion**

A faculty may ask a student whose academic progress is considered to be unsatisfactory to 'show good cause' why the student should be allowed to re-enrol. If the faculty deems the student's explanation unsatisfactory, or if the student does not provide an explanation, the student may be excluded either from a unit of study or from a course or faculty.

An excluded student may apply to the faculty for permission to re-enrol. Normally, at least two years must have elapsed before such an application would be considered. University policy relating to exclusions is set out in the *Calendar*. See also 'Appeals', 'Progression'.

**Exemption**

A decision made at a sub-unit of study level to allow a student to complete a unit of study without also completing all the prescribed components of coursework and/or assessment. See also 'Credit', 'Waiver'.

**Expulsion**

The ultimate penalty of disciplinary action is to expel the student from the University. The effect of expulsion is:

- the student is not allowed to be admitted or to re-enrol in any course at the University
- the student does not receive their results
- the student is not allowed to graduate
- the student does not receive a transcript or testamur.

**Extended semester**

A distance-learning student may be allowed more time to complete a module or program if circumstances beyond the student's control, such as illness, affect the student's ability to complete the module or program in the specified time. See also 'Distance education'.

**External**

See 'Attendance mode or attendance pattern', 'Distance education'.

**External transcript**

A certified statement of a student's academic record printed on official University security paper. It includes the student's name, any credit granted, all courses the student was enrolled in, the final course result, and all units of study attempted within each course. It also acknowledges prizes the student has received. Marks can be included or omitted, as required. See also 'Academic transcript', 'Internal transcript'.

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**F****Faculty**

A formal part of the University's academic governance structure, consisting mainly of academic staff members and headed by a dean, which is responsible for all matters concerning the award courses that it supervises. Usually, a faculty office administers the faculty and student or staff enquiries related to its courses. The *University Calendar* sets out the constitution of each of the University's faculties. See also 'Board of studies', 'Supervising faculty'.

**Faculty handbook**

An annual University publication for each faculty, that provides detailed information about the faculty, its courses and resolutions.

**FEE-HELP**

An interest-free loan facility available to fee-paying postgraduate students who are undertaking coursework programs.

**Fee-paying students**

Students who pay tuition fees to the University and are not liable for student contributions to a Commonwealth Supported Place. The Commonwealth does not contribute towards the cost of the education of fee-paying students. Annual fees vary between the faculties. Students pay a per-semester fee.

**Fellows of Senate**

Members of the governing body of the University who are either elected, appointed or ex-officio.

**Flexible learning**

See 'Delivery mode', 'Distance education'.

**Flexible start date**

Full fee-paying distance students are not restricted to the same enrolment time frames as campus-based or Commonwealth-supported students.

**Flexible Student Information System (FlexSIS)**

The computer-based Flexible Student Information System at the University of Sydney. FlexSIS holds details of courses and units of study being offered by the University and the complete academic records of all students enrolled at the University.

**Formative assessment**

See also 'Assessment'.

**Full-time student**

See 'Attendance mode', 'Equivalent full-time student load'.

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**G****Grade**

The outcome for a unit of study linked with a mark range. For example, a mark in the range 85 to 100 attracts the grade 'high distinction' (HD). See also 'Mark'.

**Graduand**

A student who has completed all the requirements for an award course but has not yet graduated. See also 'Graduation', 'Potential graduand'.

**Graduate**

A person who holds an award from a recognised tertiary institution. See also 'Graduand', 'Graduation'.

**Graduate certificate/graduate diploma**

See 'Course'.

**Graduate-entry degree**

A bachelor's degree (or other undergraduate degree), that requires another undergraduate degree as a prerequisite of entry. Examples of graduate-entry degrees at the University of Sydney include the Medical Program, Graduate Law and the Bachelor of Dentistry.

**Graduation**

The formal conferring of awards either at a ceremony or in absentia. See also 'In absentia', 'Potential graduand'.

**Graduation ceremony**

A ceremony where the Chancellor confers awards upon graduands.

**Group of Eight (Go8)**

The Group of Eight represents Australia's major research-intensive universities. Its membership comprises the vice-chancellors (presidents) of the Australian National University, Monash University, the University of Adelaide, the University of Melbourne, the University of New South Wales, the University of Queensland, the University of Sydney and the University of Western Australia. The Go8 works to ensure a consistent and sustainable policy environment which maximises the wide-ranging economic, social and cultural benefits to the Australian community of higher education and ensures Australian universities are recognised as among the best in the world.

**Group work**

A formally established project to be carried out by a number of students working together, resulting in a single piece (or assorted pieces) of assessment. See also 'Legitimate cooperation'.

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**H**
**Handbook**

See 'Faculty handbook'.

**Head of department/Head of school (HOD/HOS)**

The head of the academic unit that has responsibility for the relevant unit of study, or equivalent program leader.

**Higher Education Contribution Scheme (HECS)**

See 'HECS-HELP'.

**HECS-HELP**

An eligible student in a Commonwealth Supported Place can apply for assistance in paying their student contribution. This may take the form of a HECS-HELP loan to pay for all or some of the student's contribution, or a HECS-HELP discount if all (or at least \$500) of the student's contribution is paid by the census date.

**Honorary degrees**

A degree *honoris causa* is conferred on a person whom the University wishes to honour. It derives from the Latin translation of 'for the purpose of honouring'.

**Honours**

Some degrees may be completed 'with honours'. This may involve the completion of a separate honours year or additional work in the later years of the course. Honours are awarded in a class (Class I, Class II, which may have two divisions, or Class III).

**NSW Higher School Certificate (HSC)**

The NSW Higher School Certificate (HSC), which is normally completed at the end of year 12 of secondary school. The Australian Tertiary Admissions Rank (ATAR) is computed from a student's performance in the HSC and gives a maximum rank of 99.95.

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**I**
***In absentia***

Latin for 'in the absence of'. Awards are conferred *in absentia* when graduands do not, or cannot, attend the graduation ceremony scheduled for them. Those who have graduated *in absentia* may later request that they be presented to the Chancellor at a graduation ceremony. See also 'Graduation'.

**Instrumental supervisor/teacher**

All students at the Sydney Conservatorium of Music have an instrumental teacher appointed. See also 'Associate supervisor', 'Research supervisor', 'Supervision'.

**Internal mode**

See 'Attendance mode or attendance pattern'.

**Internal transcript**

A record of a student's academic record for the University's own internal use. It includes the student's name, student identifier (SID), address, all courses in which the student was enrolled and the final course result, and all units of study attempted within each course, together with the unit of study result. See also 'Academic transcript', 'External transcript'.

**International student**

Any student who is not an Australian or New Zealand citizen or a permanent resident of Australia. An international student is required to hold a visa that allows study in Australia and may be liable for international tuition fees.

***Fee-paying***

A private international student who is liable to pay tuition fees for their studies with the University.

***Fee-paying – outgoing exchange***

An international fee-paying student undertaking short-term study at a recognised overseas institution with which the University has a student exchange agreement. Exchange study counts towards the

student's University of Sydney award, and students remain enrolled in their University of Sydney course during the period of exchange.

***International – non-award or cross-institutional***

An international fee-paying student undertaking non-award study at the University on a cross-institutional basis. They are liable to pay fees for the study they undertake at the University, but there is no compliance reporting requirement – this rests with their 'home' institution.

***International – sponsored***

A private international student who is fully sponsored for their tuition. Their sponsorship may also include overseas health cover and compulsory subscriptions.

***Offshore studies***

International offshore students undertake their program of study at one of the University's offshore campuses and do not enter Australia. Therefore they do not require a visa. They are distinct from international students who are on outbound exchange programs as they never enter Australia during their program of study.

***Short course***

An international fee-paying student undertaking a short course with the University of Sydney such as international development programs, executive training or study visits. The study undertaken by these students is non-award and generally a student visa is not required.

***Sponsored award***

An international student sponsored by the Australian Government, undertaking a program of study at the University. Currently, holders of Australian Development Scholarships funded by AusAID are the only students in this category. These students are fully sponsored for their tuition and other costs such as travel and health cover, and are paid a stipend.

***Study Abroad***

An international student who is undertaking short-term study at the University under the Study Abroad scheme. Study Abroad students must have completed at least one year of study towards a degree at a recognised institution in their home country and must be continuing towards the degree of their home institution. See also 'Local student', 'Student type'.

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**L**
**Learning entitlement**

See 'Student learning entitlement'.

**Leave**

See 'Course leave'.

**Legitimate cooperation**

Any constructive educational and intellectual practice that aims to facilitate optimal learning outcomes through student interaction. See also 'Group work'.

**Load**

The sum of the weights of all the units of study in which a student is enrolled. The weight is determined by the proportion of a full year's work represented by the unit of study in the degree or diploma for which the student is a candidate. Student load is measured in terms of Equivalent Full-Time Student Load (EFTSL). See also 'Equivalent full-time student load'.

**Local student**

Local students are defined as an Australian or New Zealand citizen or an Australian permanent resident. See also 'Commonwealth Supported Place', 'Domestic student', 'International student'.

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**M****Major**

A field of study, chosen by a student to represent their principal interest. This is comprised of specified units of study from later stages of the award course. Students select and transfer between majors by virtue of their selection of units of study. One or more majors may be awarded upon the graduand's assessment of study. See also 'Course', 'Minor', 'Stream'.

**Major timetable clash**

The term used when a student attempts to enrol in units of study that have so much overlap in the teaching times that it is decided they may not enrol in the units simultaneously.

**Mark**

An integer (rounded if necessary) from 0 to 100 indicating a student's performance in a unit of study. See also 'Grade'.

**Master's degree**

A postgraduate award. Master's degree courses may be offered by coursework, research only or a combination of coursework and research. Entry to the course often requires completion of an honours year at an undergraduate level. See also 'Course'.

**Mature-age student**

A student who is 21 years or older on 1 March of the year in which they commence studies, and who has not completed the high school qualifications normally needed to gain entry.

**Method of candidature**

A course is either a research course or a coursework course and so the methods of candidature are 'research' and 'coursework'. See also 'Course (Coursework)', 'Course (Research)'.

**Mid-year intake**

Admission to degree programs for Semester Two.

**Minor**

Studies undertaken to support a major. Minor studies require smaller number of credit points than a major. Students select and transfer between minors (and majors) by virtue of their selection of units of study. One or more minors may be awarded upon the graduand's assessment of study. See also 'Course', 'Major', 'Stream'.

**Mixed mode**

See 'Attendance mode or attendance pattern'.

**MPhil**

The Master of Philosophy (MPhil) is a master's by research degree offered by some (but not all) of the University's faculties. See also 'Course', 'Master's degree'.

**Mutually exclusive units of study**

See 'Prohibited combinations of units of study'.

**MyUni**

The University of Sydney's student portal system. It provides access to email, library services, student self-administration, support services, e-learning software such as Blackboard and WebCT, as well as information about the University and its courses.

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**N****Non-award course**

See 'Course'.

**Non-standard session**

A teaching session other than the standard Semester One and Semester Two sessions – such as Sydney Summer School or Winter School, in which units of study are delivered and assessed in an intensive mode during January or July respectively. See also 'Semester', 'Session'.

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**O****Orientation Week**

Orientation Week, or 'O Week', takes place in the week before lectures begin in Semester One. During O Week students can join various clubs, societies and organisations, register for courses with departments and take part in activities provided by the University of Sydney Union.

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**P****Part-time student**

See also 'Attendance mode or attendance pattern', 'Equivalent full-time student load'.

**Permanent home address**

The address used for all official University correspondence with a student, both inside and outside of semester time (eg during semester breaks), unless the student provides a different address for use during the semester. See also 'Semester address'.

**PhD**

The Doctor of Philosophy (PhD) and other doctorate awards are the highest awards available at the University. A PhD course is normally purely research-based; the candidate submits a thesis that is an original contribution to the field of study. See also 'Course', 'Doctorate'.

**Plagiarism**

Presenting another person's ideas, findings or work as one's own by copying or reproducing them without acknowledging the source. See also 'Academic dishonesty'.

**Policy Online**

The website which provides access to the University's current policies, procedures and guidelines.

**Postgraduate**

A term used to describe a course leading to an award such as a graduate diploma, a master's degree or a PhD, which usually requires prior completion of a relevant undergraduate degree (or diploma) course. A 'postgraduate' is a student enrolled in such a course. See also 'Course (Coursework)', 'Course (Research)'.

**Postgraduate Education Loans Scheme (PELS)**

See 'FEE-HELP'.

**Potential graduand**

A student who has been identified as being eligible to graduate on the satisfactory completion of their current studies. See also 'Graduand', 'Graduation'.

**Pre-enrolment**

Pre-enrolment – also known as provisional re-enrolment – takes place in October, when students indicate their choice of unit of study enrolment for the following year. After results are approved, pre-enrolment students are regarded as enrolled in those units of study for which they are qualified. Their status is 'enrolled' and remains so provided they pay any money owing and comply with other requirements by the due date.

Students who do not successfully pre-enrol in their units of study for the next regular session are required to attend the University on set dates during the January/February enrolment period. See also 'Enrolment'.

**Prerequisite**

A unit of study that is required to be successfully completed before another unit of study can be attempted. Prerequisites can be mandatory (compulsory) or advisory. See also 'Assumed knowledge', 'Corequisite', 'Qualifier', 'Waiver'.

**Prizes**

Awarded in recognition of outstanding performance, academic achievement or service to the community or University.



**Probationary candidature**

A student who is enrolled in a postgraduate course on probation for a period of time up to one year. The head of department/school is required to consider the candidate's progress during the period of probation and make a recommendation for normal candidature or otherwise to the faculty.

**Professional practice**

Some students undertake placement in a professional practice as part of their course requirements. This may require University-approved supervision. Professional placements are located in a wide range of professional practice environments, and may not require additional criteria to be fulfilled.

**Program**

Each degree is composed of various units of study. The way the units are put together for a degree is referred to as a student's 'program'.

**Progression**

Satisfactory progression is satisfying all course and faculty rules (normally assessed on an annual basis) to enable the completion of the chosen award within the (maximum) completion time allowed. See also 'Exclusion'.

**Prohibited combinations of units of study**

When two or more units of study contain a sufficient overlap of content, enrolment in any one such unit prohibits enrolment in any other identified unit. See also 'Unit of study'.

**Provisional re-enrolment**

See 'Pre-enrolment'.

**Q****Qualification**

An academic attainment recognised by the University.

**Qualifier**

A mandatory (compulsory) prerequisite unit of study which must have a grade of pass or better. See also 'Assumed knowledge', 'Corequisite', 'Prerequisite', 'Waiver'.

**R****Recycling**

The submission for assessment of one's own work, or of work which is substantially the same, that has previously been counted towards the satisfactory completion of another unit of study, and credited towards a university degree, and where the examiner has not been informed that the student has already received credit for that work.

**Registration**

In addition to enrolling with the faculty in units of study, students must register with the department responsible for teaching each unit. This is normally done during Orientation Week. Note that unlike enrolment, registration is not a formal record of units attempted by the student.

**Research course**

See 'Course (Research)'.

**Research supervisor**

A supervisor is appointed to each student undertaking a research postgraduate degree. The supervisor will be a full-time member of the academic staff or a person external to the University recognised for their association with the clinical teaching or the research work of the University. See also 'Associate supervisor', 'Instrumental supervisor/teacher', 'Supervision'.

**Research Training Scheme (RTS)**

The RTS provides Commonwealth-funded higher degree by research (HDR) students with an 'entitlement' to a HECS exemption for the duration of an accredited HDR course, up to a maximum period of four years full-time equivalent study for a doctorate by research and two years full-time equivalent study for a master's by research.

**Result**

The official statement of a student's performance in each unit of study attempted as recorded on the academic transcript, usually expressed as a mark and grade. See also 'Grade', 'Mark'.

**Result processing**

Refers to the processing of assessment results for units of study. For each unit of study, departments/schools tabulate results for all assessment activities and assign preliminary results. See also 'Assessment', 'Examination period', 'Formative assessment'.

**Result processing schedule**

The result processing schedule will be determined for each academic cycle. All schools and faculties are expected to comply with this schedule. See also 'Assessment', 'Examination period'.

**S****Scholarships**

Financial or other form of support made available to enable students to further their studies. See also 'Bursaries'.

**School**

A school or academic unit that encourages and facilitates teaching, scholarship and research, and coordinates the teaching and examining duties of members of staff in their subjects or courses of study.

**Semester**

A half-yearly teaching session, the dates for which are determined by the Academic Board. Normally all undergraduate sessions will conform to the semesters approved by the Academic Board. Any offering of an undergraduate unit not conforming to the semester dates (non-standard session) must be given special permission by the Academic Board. See also 'Non-standard session', 'Session'.

**Semester address**

The address to which all official University correspondence is sent during semester time, if different to the permanent address.

**Senate**

The governing body of the University. See the *University Calendar* ([www.usyd.edu.au/calendar](http://www.usyd.edu.au/calendar)) for more details of its charter and powers.

**Session**

Any period of time during which a unit of study is taught. A session differs from a semester in that it need not be a six-month teaching period, but it cannot be longer than six months. Each session maps to either Semester One or Two for DEEWR reporting purposes. Session offerings are approved by the relevant dean, taking into account all the necessary resources, including teaching space and staffing. The Academic Board must approve variation to the normal session pattern. See also 'Non-standard session', 'Semester'.

**Session address**

See 'Semester address'.

**Short course**

A fee-paying student undertaking a short course with the University of Sydney such as professional development or executive training. The study undertaken by these students is a non-award course.

**Show cause**

See 'Exclusion', 'Progression'.

**Special consideration**

Candidates who suffer serious illness or misadventure which may affect performance in any assessment may request that they be given special consideration in relation to the determination of their results.

**Special Studies Program (SSP)**

A period of release from normal duties to allow academic staff to undertake a planned program of academic activity and development.

**Sponsorship**

Financial support of a student by a company or government body.

**Stage**

A normal full-time course of study taken in a year. See also 'Course rules', 'Equivalent full-time student load', 'Progression'.

**Strategic Directions**

See also 'University Strategic Directions'.

**Stream**

A defined award course, which requires the completion of set units of study as specified by the course rules for the particular stream, in addition to the core program specified by the course rules. A stream will appear with the award course name on testamurs, eg Bachelor of Engineering in Civil Engineering (Construction Management). See also 'Course', 'Major', 'Minor'.

**Student**

A person enrolled as a candidate for an award course or unit of study.

**Student Appeals Body**

Any student may appeal to the Student Appeals Body against an academic decision on the ground that due academic process has not been observed by the relevant faculty in relation to the academic decision. Refer to the *University of Sydney (Student Appeals against Academic Decisions) Rule 2006* for more details. See also 'Appeals'.

**Student Disciplinary Appeals Committee**

Any student may appeal to the Student Disciplinary Appeals Committee against a misconduct determination by the Vice-Chancellor or a Student Proctorial Board. See also 'Appeals'.

**Student identifier (SID)**

A nine-digit number that uniquely identifies a student at the University.

**Student ID Card**

All full-time or part-time students who successfully enrol at the University of Sydney will receive a Student Card. New students will have their card issued in person at the time of enrolment. Successful re-enrolling students will receive their card by mail.

The Student Card includes the student's name, student identification number (SID), a digitised photo and the library borrower's number and barcode. Where applicable, it will also display a travel concession logo from the Ministry of Transport (if student eligibility requirements are met).

The card has a number of interoperable uses, such as the ability to purchase printing and photocopying services at the University's libraries and gain access to certain secure buildings. The card identifies the student as eligible to attend classes and must be displayed at formal examinations. It must also be presented to secure student concessions and to borrow books from all sections of the University Library.

For more information about Student ID Cards please visit the Card Centre (or see the website: [www.usyd.edu.au/card\\_centre](http://www.usyd.edu.au/card_centre)).

**Student learning entitlement**

All Australian citizens, New Zealand citizens and holders of a permanent visa are allocated a Student Learning Entitlement (SLE) of up to seven years equivalent full-time study. This is measured in equivalent full-time student load (EFTSL), which is the proportion of a full-time load that a unit of study represents. The University sets an EFTSL value for each unit of study it offers. To be Commonwealth-supported for a unit, a student must have enough SLE to cover the EFTSL value of that unit.

**Student progress rate (SPR)**

A calculation that measures the rate at which the load undertaken is passed annually in each award program.

**Student type**

Student type identifies whether a student is local or international and the type of study the student is undertaking. See also 'Domestic student', 'Exchange student', 'International student'.

**Study Abroad program**

A scheme administered by the International Office that allows international students who are not part of an exchange program to take units of study at the University of Sydney, but not towards an award program. In most cases the units of study taken here are credited towards an award at the student's home institution. See also 'Exchange student'.

**Subject area**

A unit of study may be associated with one or more subject areas. The subject area can be used to define prerequisite and course rules, for example the unit of study 'History of Momoyama and Edo Art' may count towards the requirements for the subject areas 'Art History and Theory' and 'Asian Studies'.

**Summative assessment**

See 'Assessment'.

**Summer School**

See 'Sydney Summer School'.

**Supervising faculty**

The faculty which has the responsibility for managing the academic administration of a particular course, such as the interpretation and administration of course rules, approving students' enrolments and variations to enrolments.

Normally the supervising faculty is the faculty offering the course. However, in the case of combined courses, one of the two faculties involved will usually be designated the supervising faculty. In the case where one course is jointly offered by two or more faculties (eg the Liberal Studies course), a joint committee may make academic decisions about candidature and the student may be assigned a supervising faculty for administration.

**Supervision**

Refers to a one-to-one relationship between a student and a nominated member of the academic staff or a person specifically appointed to the role. See also 'Associate supervisor', 'Instrumental supervisor/teacher', 'Research supervisor'.

**Suspension of candidature**

See also 'Course leave'.

**Suppression of results**

Results for a particular student can be suppressed by the University when the student has an outstanding debt to the University (this particularly applies to international students who have not paid their tuition fees), or when the student is facing disciplinary action. A student may also request a suppression for personal reasons.

**Sydney Summer School**

A program of accelerated, intensive study running for approximately six weeks during January and February each year. Both undergraduate and postgraduate units are offered. Sydney Summer School provides an opportunity for students at Sydney and other universities to catch up on required units of study, to accelerate completion of a course or to undertake a unit that is outside their award course. All units attract full fees, but some scholarships are available.

**Sydney Winter School**

An intensive session offered by the University in July during the mid-year break. See 'Sydney Summer School'.

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**T**
**Teaching department**

See 'School'.

**Teaching end date**

Official finish date of formal timetabled classes.

**Teaching start date**

Official commencement date of formal timetabled classes.

**Terminated**

Term used when a student's candidature has been officially closed because they are not able to complete the course requirements. See also 'Candidature'.

**Testamur**

A certificate of award provided to a graduand, usually at a graduation ceremony. The University award conferred is displayed along with other appropriate details.

**Thesis**

A major work that is the product of an extended period of supervised independent research. See also 'Course (Research)'.

**Timetable**

The schedule of lectures, tutorials, laboratories and other academic activities that a student must attend.

**Transcript**

See 'Academic transcript'.

**Transfer**

See 'Course transfer'.

**Tuition fees**

Tuition fees may be charged to students in designated tuition fee-paying courses. Students who pay fees are not liable for HECS.

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**U**
**Universities Admissions Centre (UAC)**

The UAC receives and processes applications for admission to undergraduate courses at recognised universities in NSW and the ACT. Most local undergraduate students at the University of Sydney apply through the UAC.

**Universities Admission Index (UAI)**

A measure of overall academic achievement in the HSC that helps universities rank applicants for university selection. The UAI is a rank of any student's performance relative to other students. It is calculated from the aggregate of scaled marks in 10 units of the HSC (two best English units plus eight other units, including only two category B units) and is presented as a number between 0.00 and 99.95 with increments of 0.05.

In June 2009 the UAI was replaced by the Australian Tertiary Admissions Rank (ATAR). See 'Australian Tertiary Admissions Rank'.

**Under examination**

Indicates that a research student has submitted their written work (thesis) for assessment, and is awaiting the finalisation of the examiners' outcome and recommendation.

**Undergraduate**

A term used to describe both a course leading to a diploma or bachelor's degree and a student enrolled in such a course.

**Unit of study**

Unit of study or unit means a stand-alone component of an award course. Each unit of study is the responsibility of a department. See also 'Prohibited combinations of unit of study'.

**Unit of study enrolment status**

This indicates whether the student is still actively attending the unit of study (currently enrolled) or is no longer enrolled. See also 'Cancellation of enrolment', 'Discontinuation'.

**Unit of study level**

Units of study are divided into junior, intermediate, senior, honours, Year 5, and Year 6. Most majors consist of 32 senior credit points in a subject area (either 3000 level units of study or a mix of 2000 and 3000 level units of study).

**University**

Unless otherwise indicated, the term 'University' in this document refers to the University of Sydney.

**University Calendar**

The annual University publication available in print and online that provides general and historical information about the University of Sydney, the statutes and regulations under which it operates and the Senate resolutions relating to constitutions and courses in each faculty.

**University Medal**

A faculty may recommend the award of a University Medal to a student qualified for the award of an undergraduate honours degree whose academic performance is judged to be outstanding.

**University Strategic Directions**

This refers to the University of Sydney *Strategic Plan 2007–2010*. A new plan is currently in development.

**Upgrade**

Where a student enrolled in a master's by research course is undertaking research at such a standard that either the University recommends that the student upgrade their degree to a PhD, or the student seeks to upgrade to a PhD and this is supported by the University.

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**V**
**Variation of enrolment**

See 'Enrolment variation'.

**Vice-Chancellor and Principal**

The chief executive officer of the University, responsible for its leadership and management. The Vice-Chancellor and Principal is head of both academic and administrative divisions.

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**W**
**Waiver**

In a prescribed course, a faculty may waive the prerequisite or corequisite requirement for a unit of study or the course rules for a particular student. Unlike credit, waivers do not involve a reduction in the number of credit points required for a course. See also 'Credit', 'Exemption'.

**WAM weight**

A weight assigned to each unit of study to assist in the calculation of WAMs.

**Weighted average mark (WAM)**

This mark uses the unit of study credit point value in conjunction with an agreed 'weight'. The formula for this calculation is:

$$WAM = \frac{\sum (W_c \times M_c)}{\sum (W_c)}$$

(Sums over all units of study completed in the selected period.)

The mark is the actual mark obtained by the student for the unit of study, or in the case of a failing grade with no mark – 0. Pass/Fail assessed subjects and credit transfer subjects (from another institution) are excluded from these calculations. However, the marks from all attempts at a unit of study are included. (Effective from 1 January 2004.)

In addition, faculties may adopt other average mark formulae for specific progression or entry requirements. If such a formula is not specified in the faculty resolutions, the formula outlined above is used. See also 'WAM weight'.

**Winter School**

See 'Sydney Winter School'.

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**Y**

**Year of first enrolment (YFE)**

The year in which a student first enrolls at the University. See also 'Commencement date'.

**Youth allowance**

Youth allowance is payable to a full-time student or trainee aged 16 to 24 years of age who is enrolled at an approved institution such as a school, college, TAFE or university, and who is undertaking at least 15 hours a week face-to-face contact.

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**The  
University  
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# Directory

## University buildings

O6	Aeronautical Engineering Building	L4	Law School
J4	Anderson Stuart Building	F1	Mackie Building
G3	Badham Building	H3	MacLaurin Hall
H3	Bank Building	H2	Macleay Building
L2	Baxter's Lodge	G1	Margaret Telfer Building
L8	Biochemistry and Microbiology Building	J6	Madsen Building
E6	Blackburn Building	H4	Manning House
E7	Bosch Building 1A	H4	Manning Squash Courts
E7	Bosch Building 1B	D3	McMaster Annex
H3	Brennan MacCallum Building	D3	McMaster Building
E6	Bruce Williams Pavilion	O6	Mechanical Engineering Building
L6	Carlaw Building	A2	Mechanical Foundation Building
F4	Chaplaincy	K8	Merewether Building
M8	Chemical Engineering Building	L4	New Law Building
J5	Chemistry Building	E1	No. 1-3 Ross Street
N8	Civil Engineering Building	M7	Old School Building
N9	Civil Engineering Workshop	F4	Old Teachers' College
K10	Clark Building	H3	Pharmacy Building
J9	Darlington Centre	H6	Physics Annex
J10	Darlington House	G5	Physics Building
K9	Darlington Road Terraces	N8	PNR Building
L10	Demountable Village	E6	Queen Elizabeth II Research Institute
K5	Eastern Avenue Auditorium & Lecture Theatre Complex	H5	RC Mills Building
L9	Economics and Business Building	F2	RD Watt Building
H2	Edgeworth David Geology Building	D4	RMC Gunn Building
G4	Education Building	M9	Raglan Street Building
H4	Education Building Annex	N7	Rose Street Building
H5	Edward Ford Building	E2	Ross Street Building
N7	Electrical Engineering Building	G2	Science Road Cottage
N7	Engineering Link Building	E1	Selle House
C3	Evelyn Williams Building	M10	Services Building
K3	Fisher Library	N6	Seymour Centre
K4	Fisher Library Stack	K10	Shepherd Centre
G2	Footbridge Theatre	O6	Shepherd Street Carpark
C3	Gatekeeper's Lodge	K9	Storie Dixon Wing
J7	Gatekeeper's Lodge (City Road)	L4	Sydney Law School
M8	Gordon Yu-Hoi Chui Building	K5	Teaching Building
J2	Great Hall	F5	The Arena Sports Centre
G3	Griffith Taylor Building	J3	The Quadrangle
D4	HK Ward Gymnasium	J5	Transient Building
F2	Heydon-Laurence Building	L10	University Computing Centre
G2	Holme Building	M9	University Sports & Aquatic Centre
N5	Information Technologies	D3	Veterinary Science Conference Centre
K8	Institute Building	E6	Victor Coppleston Building
N5	International House	F3	Wallace Theatre
J10	IXL Building	K7	Wentworth Building
D3	JD Stewart Building	E7	Western Avenue Carpark
F2	JRA McMillan Building	M6	WH Mase Building
L7	Jane Foss Russell Building	M6	Wilkinson Building
F3	John Woolley Building		

## Childcare centres

K11	Boundary Lane
F9	Carlton Avenue
N9	KU Union
H1	Laurel Tree House

## Colleges & residential accommodation

J10	Darlington House
K9	Darlington Road Terraces
N5	International House
L10	Mandelbaum House
A4	Sancta Sophia College
C8	St Andrew's College
B5	St John's College
L6	St Michael's College
B6	St Paul's College
G7	Selle House
E1	Sydney University Village
D10	Sydney University Village
F7	Wesley College
G8	Women's College

## Computer Access Centres

H3	Brennan
G4	Education
K3	Fisher
N7	Link
L6	McGrath (Carlaw)
H3	Pharmacy

## Cultural venues

H2	Macleay Museum
J3	Nidholson Museum
N6	Seymour Centre
K7	Sir Hermann Black Gallery
M6	Tin Sheds Gallery
J2	University Art Gallery

## Faculties (offices)

F2	Agriculture, Food and Natural Resources
M6	Architecture
H3	Arts
K8	Economics & Business
G4	Education and Social Work
N7	Engineering
L4	Law
H5	Medicine
H3	Pharmacy
L6	Science
D3	Veterinary Science

## Libraries

G3	Badham
H5	Burkitt-Ford
K3	Fisher
L4	Freehills Law Library
E7	Medical
H5	Schaeffer Fine Arts
L7	SciTech

## Retail

H3	Australia Post Office
J9	Darlington Centre
G2	Hoime Building
L7	Jane Foss Russell Building
H4	Manning House
F5	The Arena Sports Centre
M9	University Copy Centre
K7	University Health Service
M9	University Sports & Aquatic Centre
M9	University Co-op Bookshop
C3	Valentine Charlton Cat Centre
C3	Veterinary Hospital & Clinic
K7	Wentworth Building

## Security

M10	Emergency Services
M10	Lost Property
M10	Traffic & Parking

## Sports & recreational venues

K2	Fisher Tennis Courts
D4	HK Ward Gymnasium
H5	Lawn Tennis Courts
H4	Manning Squash Courts
F5	The Arena Sports Centre
G5	The Square
E5	University Oval No. 1
E3	University Oval No. 2
M9	University Sports & Aquatic Centre

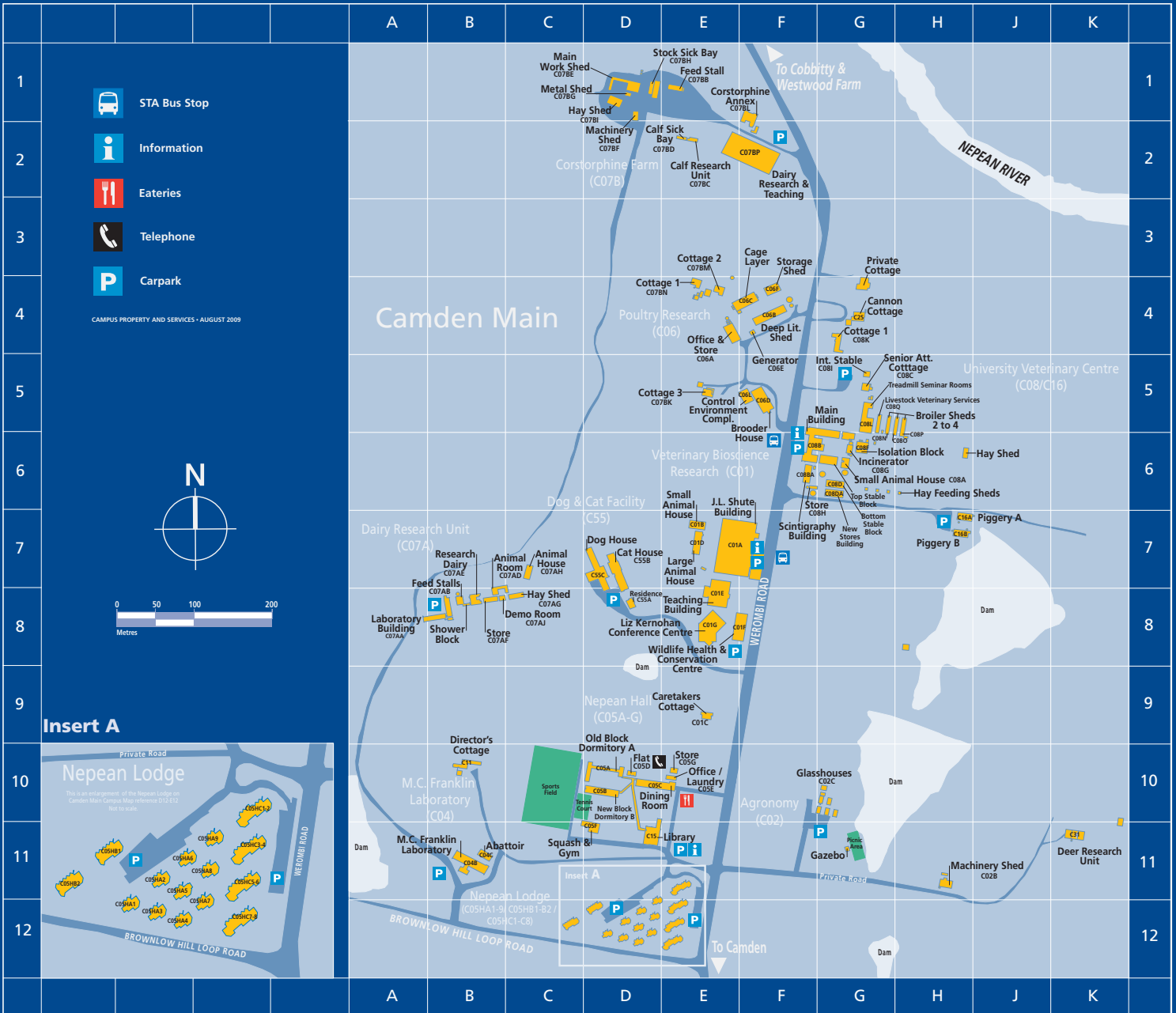
## Unions & associations (offices)

K7	Students' Representative Council (SRC)
M9	Sydney University Postgraduate Representative Association (SUPRA)
M9	Sydney Uni Sport & Fitness
G2	University of Sydney Union

## University administration, centres & services

L7	Accommodation Service
H3	Alumni Relations Office
L7	Careers Centre
L7	Cashier
D10	Centre for Continuing Education
K7	Centre for English Teaching
H3	Chancellor
L7	Counselling Service
L7	Disability Services
L7	Equity Support Services
H2	Executive Offices
L7	Financial Assistance Office
G1	Financial Services
J3	Information Centre
L10	Information and Communications Technology Services
L7	International Office
L7	International Student Support Unit
G4	Learning Centre
L6	Mathematics Learning Centre
H2	Media Office
G1	Office of General Counsel
L7	Research Office
L7	Scholarships and Prizes Office
L7	Student Centre
L7	Student Support Services
K8	Summer School
K8	Support Sydney
M10	SydneyPeople – HR Service Centre
D9	SydneyPeople – Learning Solutions
E1	SydneyPeople – Unistaff
L7	Sydney Talent
O5	Sydnovate
F3	United States Studies Centre
G2	University of Sydney Venue Collection
C3	Veterinary Hospital & Clinic
H2	Vice-Chancellor

# CAMDEN MAIN





# Directory

## University Buildings

### Agronomy

- H11 Machinery Shed (C02B)
- G10 Glasshouses & Boiler Room (C02C)
- K11 Deer Research Unit (C02D)

### Corstorphine Farm

- E1 Feeding Stalls & Office (C07BB)
- E2 Calf Research Unit (C07BC)
- E2 Calf Sick Bay (C07BD)
- D1 Main Work Shed (C07BE)
- D1 Machinery Shed (C07BF)
- D1 Metal Shed (C07BG)
- D1 Stock Sick Bay (C07BH)
- D1 Hay Shed (C07BI)
- E5 Cottage No. 3 (C07BK)
- F1 Corstorphine Annexe (C07BL)
- E4 Cottage No. 2 (C07BM)
- E4 Cottage No. 1 (C07BN)
- F2 Dairy Research & Learning (C07BP)

### Dairy Research Unit

- B8 Laboratory (C07AA)
- B8 Feed Stalls (C07AB)
- B8 Animal Room (C07AD)
- B8 Research Dairy (C07AE)
- B8 Store (C07AF)
- C8 Hay Shed (C07AG)

- C8 Animal House (C07AH)
- B8 Demo Room (C07AJ)

### Dog and Cat facility

- D8 Residence (C55A)
- D7 Cat House (C55B)
- DT Dog House (C55D)

### M.C. Franklin

- B11 Laboratory (C04B)
- B11 Abattoir (C04C)
- B10 Director's Cottage (C11)

### Nepean Hall

- D10 Old Block - Dormitory A (C05A)
- D10 New Block - Dormitory B (C05B)
- D10 Dining Room (C05C)
- D10 Flat (C05D)
- E10 Office & Laundry (C05E)
- D11 Squash Court & Gym (C05F)
- E10 Store (C05G)
- D11 Library (C15)

### Nepean Lodge

- D12 Group A, No1 to No 9 (C05HA1-9)
- D12 Group B, No1 (C05HB1)
- D12 Group B, No2 (C05HB2)
- E11 Group C, No1 & 2 (C05HC1-2)
- E12 Group C, No3 & 4 (C05HC3-4)

- E12 Group C, No5 & 6 (C05HC5-6)
- E12 Group C, No7 & 8 (C05HC7-8)

### Poultry Research

- E4 Office & Store (C06A)
- F4 Deep Lit. Shed (C06B)
- F4 Cage Layer Shed (C06C)
- F5 Brooder House (C06D)
- F4 Generator Building (C06E)
- F4 Storage Shed (C06F)
- F5 Control Environment Compl. (C06L)

### University Veterinary Centre

- G6 Small Animal House (C08A)
- F6 Main Building (C08B)
- G5 Senior Att. Cottage (C08C)
- G6 Cattle Unit (C08D)
- G6 Isolation Block (C08F)
- G6 Incinerator (C08G)
- F6 Store (C08H)
- G4 Cottage 1 (C08K)
- G5 Interlock Stable (C08I)
- H7 Piggery A (C16A)
- H7 Piggery B (C16B)
- G4 Cottage No.1 (C08K)
- G5 Treadmill Seminar Rooms (C08L)
- H5 Broiler Shed 2 to 4 (C08N-O-P)
- G5 Livestock Veterinary Services (C08Q)
- G5 Cannon Cottage (C25)

## Veterinary Bioscience Research

- E7 J.L. Shute Building (C01A)
- E7 Small Animal House (C01B)
- E9 Caretaker's Cottage (C01C)
- E7 Large Animal House (C01D)
- E8 General Teaching Building (C01E)
- E8 Wildlife Health & Conservation Centre (C01F)
- E8 Liz Kernohan Conference Centre

## Campus Facilities

- E8 Computer Laboratories (C01E)
- E8 Auditorium (C01E)
- E8 Seminar Rooms (C01E)

## Residential accomodation

- D12 Nepean lodge
- D10 Old Block Dormitory A
- D10 New Block Dormitory B

## Sports & Recreational Venues

- D11 Squash & Gym

## Libraries

- D11 Library

## Unions & Associations (offices)

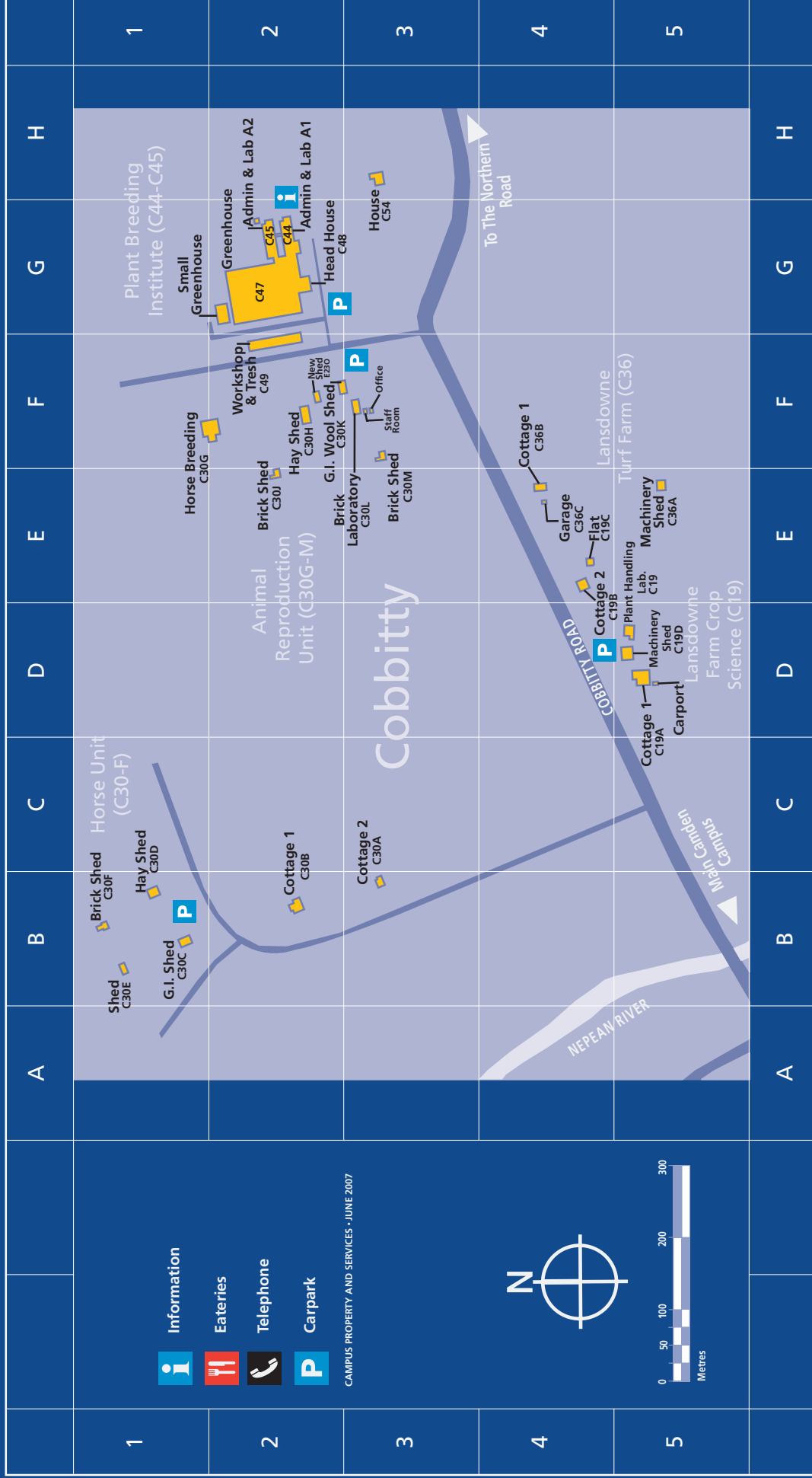
- E7 Students' Association (C01A)

## Venues

- E7 J.L. Shute Building
- G5 Treadmill Seminar Rooms

MAP CODE: 13C\_MAIN

# COBBITTY CAMPUS



- Information
- Eateries
- Telephone
- Carpark

CAMPUS PROPERTY AND SERVICES - JUNE 2007



# Directory

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## University Buildings

Lansdowne Farm  
D5 Plant Handling Lab. (C19)  
D5 Cottage 1 (C19A)  
E4 Cottage 2 (C19B)  
E4 Flat (C19C)  
D5 Machinery Shed (C19D)

Lansdowne Turf Farm  
E5 Machinery Shed (C36A)  
E4 Cottage 1 (C36B)  
E4 Garage (C36C)  
E4 Carport (C36D)

### Horse Unit

B3 Cottage 2 (C30A)  
B2 Cottage 1 (C30B)  
B1 G.I. Shed (C30C)  
B1 Hay Shed (C30D)  
B1 Brick Dairy (C30E)  
B1 Brick Shed (C30F)

### Animal Reproduction Unit

F2 Horse Breeding (C30G)  
F2 Hay Shed (C30H)  
E2 Brick Veterinary Laboratory (C30J)  
F2 G.I. Woolshed (C30K)  
F3 Brick Laboratory (C30L)  
F3 Brick Veterinary Laboratory (C30M)

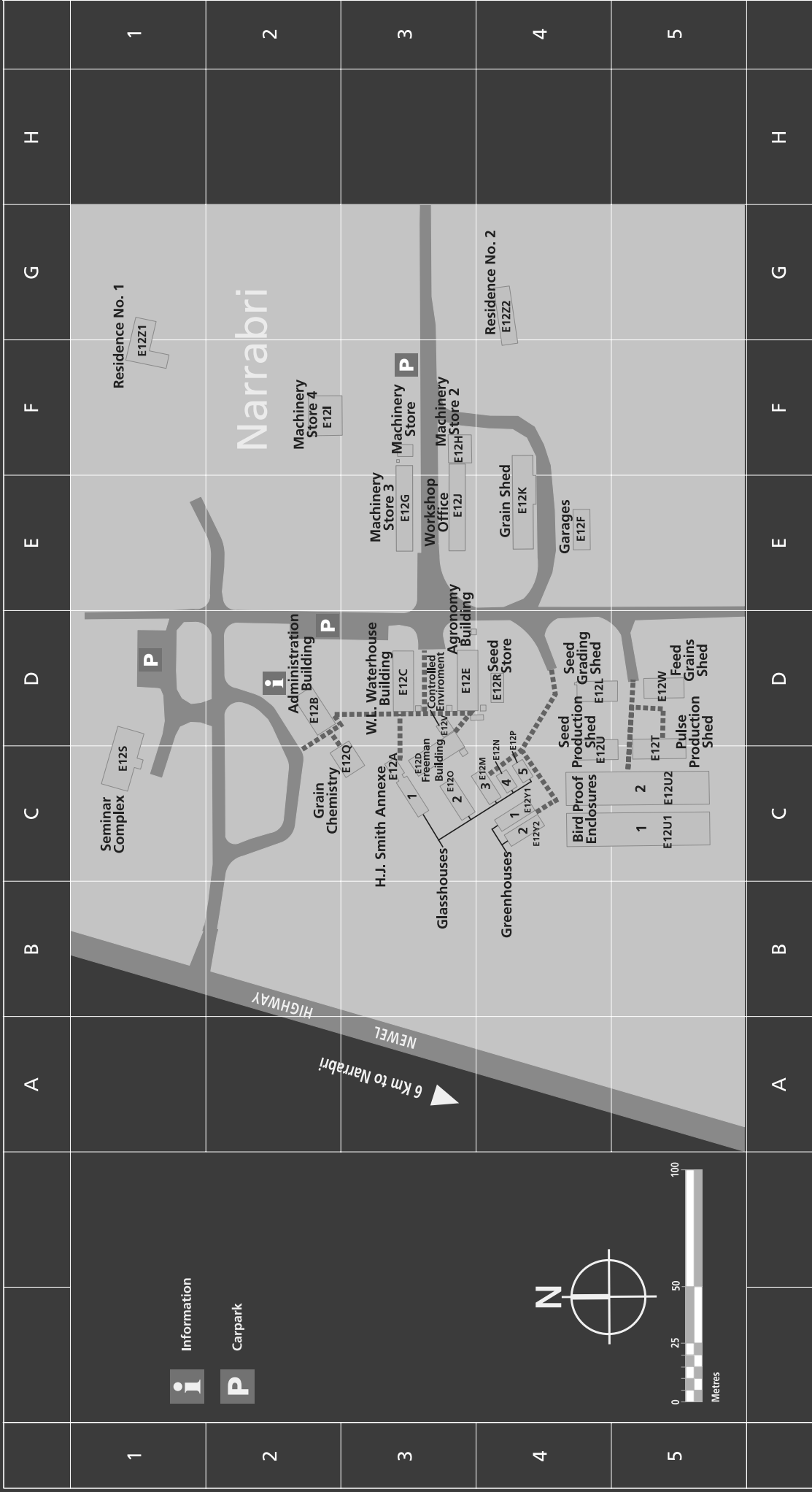
### Plant Breeding Institute

G2 Administration & Lab A1 (C44)  
G2 Administration & Lab A2 (C45)  
G2 Green House (C47)  
G2 Head House (C48)  
F2 Workshop and Thresh (C49)  
H3 House (C54)

## College Facilities

G2 Lecture Theatre (C44)

MAP CODE: 14A\_MAIN  
**NARRABRI CAMPUS**



# Directory

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## University Buildings

C3 H.J. Smith Annexe, G'House (E12A)  
D2 Administration Building (E12B)  
D3 W.L. Waterhouse Building (E12C)  
C3 W.G. Freeman Building (E12D)  
D3 Agronomy Building (E12E)  
E4 Garages (E12F)  
E3 Machinery Store 3 (E12G)  
F3 Machinery Store 2 (E12H)  
F2 Machinery Store 4 (E12I)  
E3 Workshop Office (E12J)  
E4 Grain Shed (E12K)  
D4 Seed Grading Shed (E12L)  
C4 Glasshouse 3 (E12M)  
C4 Glasshouse 4 (E12N)  
C3 Glasshouse 2 (E12O)

## Student services

D2 Student administration (E12B)

## Library

D2 Library (E12B)

## College Facilities

C1 Seminar Complex (E12S)  
E3 Workshop (E12J)

## Parking

D1 Northern car park  
D2 Southern car park

C4 Glasshouse 5 (E12P)  
C3 Grain Chem. Lab (E12Q)  
D4 Seed Store 3 (E12R)  
C1 Seminar complex (E12S)  
C5 Pulse Production Shed (E12T)  
C4 Seed Production Shed (E12U)  
D3 Controlled Environment (E12V)  
D5 Feed Grains Shed (E12W)  
D4 Residence No 1 (E12Z1)  
C4 Residence No 2 (E12Z2)  
C4 Bird Proof Enclosures (E12U1-E12U2)  
C3 Greenhouse 1 (E12Y1)  
C4 Greenhouse 2 (E12Y2)

# Course planner

Year	Semester	Unit of study 1 & credit points		Unit of study 2 & credit points		Unit of study 3 & credit points		Unit of study 4 & credit points		Total credit points
1	1									
	2									
2	summer									
	1									
	winter									
	2									
3	summer									
	1									
	winter									
	2									
4	summer									
	1									
	winter									
	2									
5	summer									
	1									
	winter									
	2									
<b>Total credit points</b>										