The University of Sydney

Faculty of Agriculture, Food and Natural Resources Handbook 2002

University semester and vacation dates 2002

Summer School	
Lectures begin	Wednesday 2 January
Summer School ends	Friday 1 March
Semester 1	
Lectures begin	Monday 4 March
Easter recess:	
Last day of lectures	Thursday 28 March
Lectures resume	Monday 8 April
Study vacation: 1 week beginning	Monday 17 June
Examinations commence	Monday 24 June
Semester 1 ends	Saturday 6 July
Semester 2	
Lectures begin	Monday 29 July
Mid-semester recess:	
Last day of lectures	Friday 27 September
Lectures resume	Tuesday 8 October
Study vacation: 1 week beginning	Monday 11 November
Examinations commence	Monday 18 November
Semester 2 ends	Saturday 7 December

Last dates for withdrawal or discontinuation 2002

Semester 1 units of study	
Last day to add a unit	Friday 15 March
Last day for withdrawal	Friday 29 March
Last day to discontinue without failure (DNF)	Friday 26 April
Last day to discontinue (Discontinued -Fail)	Friday 14 June
Semester 2 units of study	
Last day to add a unit	Friday 9 August
Last day for withdrawal	Friday 30 August
Last day to discontinue without failure (DNF)	Friday 13 September
Last day to discontinue (Discontinued - Fail)	Friday 8 November

Academic year information (Academic Board policy and dates 1998-2002) is available at: www.usyd.edu.au/su/planning/policy/acad/3_0aca.html.

The University of Sydney, NSW 2006
Phone: (02) 9351 2222
Web: www.usyd.edu.au

Faculty of Agriculture, Food and Natural Resources

Phone: (02) 9351 6926
Fax: (02) 9351 2945
Web: www.agric.usyd.edu.au

The University of Sydney
Faculty of Agriculture, Food and Natural Resources Handbook 2002
 ISSN 1034-2575.
CRICOS Provider Code 00026A.

Produced by the Publications Office, The University of Sydney.
Design, layout and database publishing by Neologica Print & Promotions, Surry Hills NSW, neologica@mac.com.
Printed by Printing Headquarters, Chippendale NSW.

Contents

Welcome from the Dean

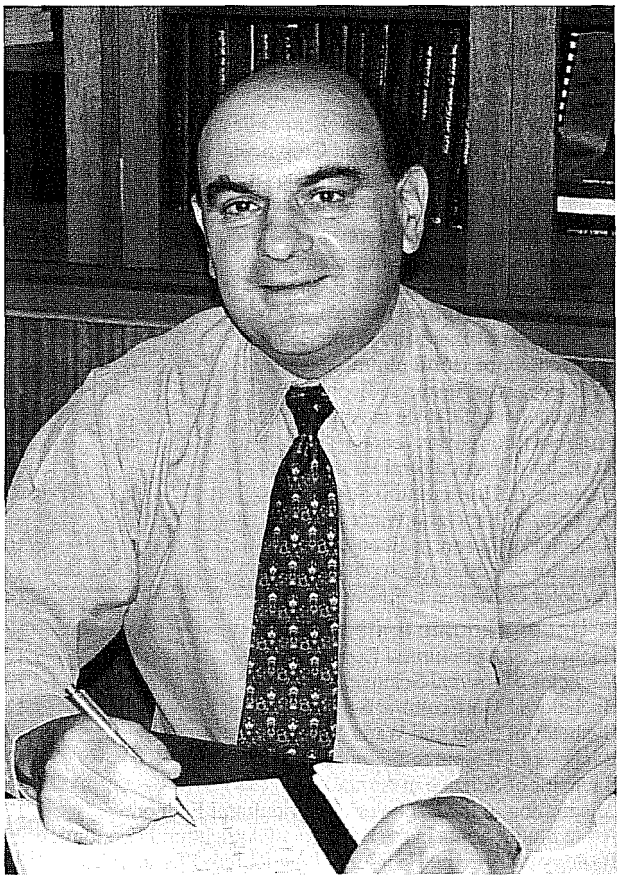
Agriculture is no longer concerned only with growing crops and producing livestock. There is a greater focus on natural resource management and better use of land and water, the diversification of processed products, globalisation of food markets, and the need to develop improved systems for food handling and distribution. In recognition of this, the Faculty is implementing important changes to signal that we are in tune with developments in modern agriculture around the world, and to ensure that the academic programs are aligned with our vision: to grow and excel in teaching, research and community service in the food, fibre and natural resource industries.

The Faculty has recently changed its name to Agriculture, Food and Natural Resources, and a new School of Land, Water and Crop Sciences has been formed by the amalgamation of the former Departments of Agricultural Chemistry and Soil Science, and Crop Sciences and the Plant Breeding Institute. The amalgamating departments share much in common in their teaching and research in sustainable cropping systems, plant improvement, post-harvest biology and processing, grains, land and water resources, and sustaining the environment. The Department of Microbiology has relocated to the Faculty of Science. The Department of Agricultural Economics has been renamed 'Agricultural and Resource Economics', to more clearly indicate it is active in teaching and research in the rapidly growing area of resource economics, as well as in the more traditional aspects of agricultural economics. The Bachelor of Agricultural Economics and Bachelor of Resource Economics degrees are unique in Australia.

Our Faculty is small by University of Sydney standards, but has a proud history in its teaching and research. It offers a diverse range of courses in the science and economics related to agricultural production, processing, marketing, and natural resource management. The students come from rural and urban backgrounds and are attracted by a broad range of interests. All of the undergraduate degrees aim to give students an appreciation of both the scientific and socio-economic frameworks of the agricultural and natural resources sectors, while affording students opportunities for specialisation in particular discipline areas. The degrees emphasise analytical, quantitative, computing and communication skills, and provide students with the opportunity in Fourth Year to complete a research project which, as employers frequently comment, provides valuable experience in planning, researching and communicating a major piece of work. All students participate in at least one extended rural field trip and complete a program of 18 weeks of professional experience, which puts the teaching into a practical context and allows the development of networks for future careers. Excursions and field-based teaching help students to get to know each other well, establish an esprit de corps in the Faculty, and build a good rapport between students and staff.

The Faculty strives to achieve high quality teaching and learning in all its programs and to ensure that its course offerings remain up-to-date, rigorous and relevant to the needs of graduates and employers. The teaching programs are underpinned by the best knowledge, recognize the diverse destinations of graduates, and that graduates need good communication and interpersonal skills to be equipped for the workplace. Our degrees are relevant locally while recognising the impact of globalisation on agricultural markets. Graduates of the Faculty enjoy high employment rates in wide-ranging occupations and express a high degree of career satisfaction.

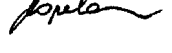
Our teaching is closely linked to strong research programs, which attract substantial external funding and an outstanding cohort of postgraduate research students. The research of the Faculty is in five main areas - sustainable crop production systems, plant improvement, post-harvest and processing, sustaining the environment, and agricultural and resource economics - with many projects in each area. Several research centres are based in the Faculty, including the Australian Centre for Precision Agriculture, Sydney University Centre for Nitrogen Fixation and the Centre for Salinity Assessment and Management, and the Faculty is an active participant in



Cooperative Research Centres associated with the wheat, cotton and rice industries. The Faculty values its extensive links with industry and maintains a strong presence in the rural sector through student excursions, professional experience placements in a range of operations and locations, and research links. The Faculty has an active international program, including inter-disciplinary international projects in Vietnam, China, Indonesia and Fiji funded by the Australian Centre for International Agricultural Research, and a substantial number of AusAid students.

Global demographic trends point to the need to double grain production by 2020. This increase will have to be achieved with less land and water available for agriculture than at present. The Faculty will play its role in meeting this challenge by providing leadership in training and research relating to food security and environmental sustainability.

I am delighted to welcome you to the Faculty and extend my best wishes for your studies and future professional career.



Les Copeland
Dean

1 Guide to the Faculty

Faculty Office

Phone: (02) 9351 2935
Fax: (02) 9351 2945
Email: dean@agric.usyd.edu.au
Web: www.agric.usyd.edu.au

■ Faculty staff

Dean
Les Copeland
Associate Deans
Stephen R Cattle
M Robyn McConchie
Balwant Singh
Carolyn Tanner
Secretary to the Faculty
Robert Jeffs, BA *Waterloo Lutheran Univ*
Administrative Officer (Development)
Michele Gairn, DipAppSc(Agr) *Wagga AgricColl* DipEd
Secretary to the Dean (Faculty Office)
Prue Winkler, BA *N'cle (NSW)*
Administrative Assistant
Pamela J Stern, BA *UNSW*

■ Departmental staff

Agricultural and Resource Economics

Phone: (02) 9351 2574
Fax: (02) 9351 4953
Email: hod.agec@agec.usyd.edu.au
Web: www.usyd.edu.au/su/agec/
Head of Department: Professor T Gordon MacAulay
Professor
T Gordon MacAulay, MAgrSc *Melb* PhD *Guelph.* Appointed 1992
Associate Professors
Fredoun Z Ahmadi-Esfahani, BS *Oregon* MA *San Francisco State* PhD *Manit*
Ross G Drynan, BAgrSc *Qld* PhD *NE*
Senior Lecturers
David P Godden, BAgEc BA MEc *NE* PhD *Lond*
Carolyn Tanner, BScAgr
Guang Hua Wan, BAgEc *Nanjing Agric Univ* MEc PhD *NE*
Associate Lecturers
Lynn A Henry, BEc DipAgEc *NE*
Shauna L Phillips, MComm NSW BAgrEc
First Year Adviser
Elizabeth Nolan, BScAgr
Research Fellows
Sally Marsh, BSc(Agric), MSc(Agric) *WAust*
Kate Owen, BBus *KCAE* BEcon PhD *NE*
Emeritus Professor
KO Campbell, AM PhD *Chic* MPA *Harv* HonDEc *NE* HonDAgrSc BScAgr, FASSA
Honorary Research Associate
Robert L Batterham, BAgEc *NE* MS PhD *III*

School of Land, Water and Crop Sciences

Phone: (02) 9351 2529
Fax: (02) 9351 4172
Email: roseh@agric.usyd.edu.au
Web: www.cropsci.usyd.edu.au/
Head of School: Associate Professor HA Rose
Professor
Les Copeland, BSc PhD, MRACI CChem. Appointed 2001
Professor of Applied Mycology
Lester W Burgess, BScAgr PhD DipEd. Appointed 2000
Professor of Soil Science
Alexander B McBratney, DSc PhD *Aberd.* Appointed 1995
Personal Chair in Agricultural and Environmental Chemistry
Ivan R Kennedy, PhD DSc(Agric) *WAust,* FRACI CChem. Appointed 1996
Associate Professors
Michael E O'Neill, BA PhD
Harley A Rose, MAgrSc *Qld* PhD *Cornell*
Bruce G Sutton, BScAgr *Qld* PhD *ANU*
Senior Lecturers
Robert A Caldwell, MSc PhD, MRACI CChem
Lindsay C Campbell, BSc PhD
Stephen R Cattle, BScAgr PhD
Edith M Lees, BSc PhD *Lond*
M Robyn McConchie, BSc *Lond* MA(Ed) *Macq* PhD *LSU*
Balwant Singh, BSc(Agric), MSc(SoilSc) *Haryana,* PhD *WAust*
Peter C Thomson, MSc MAppStat *Macq* PhD
McCaughey Lecturer in Hydrology and Catchment Management
Willem Vervoort, MSc *Wageningen,* PhD *Georgia*
Emeritus Professor
Brian James Deverall, BSc *Edin* PhD DIC *Lond*
BDH Latter, PhD *Edin* BScAgr
Senior Research Fellow
AD Clift, BScAgr PhD
John Triantafilis, BScAgr, PhD
Research Fellows
E K Dann, BScAgr, PhD
Yong Huang, PhD
Nanju Lee, BScAgr PhD
IOA Odeh, BSc(Agric) *Ibadan* MSc *Ahmando Bello* PhD *Adel*
Shuo Wang, MScAgr, PhD
Brett Whelan, BScAgr PhD
Honorary Appointment: Emeritus Professor
N Collis-George, BSc *Mane* PhD *Camb* HonDScAgr, FRSChem
Honorary Research Associates
GD Batten, PhD *ANU*
G Constable, PhD *ANU,* MScAgr
GM Cunningham, BScAgr
DJ Fletcher, MSc *UWA,* PhD *Macq*
Harold R Geering, MS *Cornell*
C Green, BSc, PhD *London*
MRB Gray, MSc *UWA,* PhD *S'ton*
JJ Jobling, BScAgr, PhD *UWS*
Norman K Matheson, PhD *Edin* MSc
PW Michael, BAgSc, PhD *Adel*
JRPym
Rodney J Roughley, PhD *Lond* MScAgr
LW Smith, BAgSc *Melb* MSc PhD *Calif*
BA Summerell, BScAgr PhD
PTW Wong, BScAgr PhD

Plant Breeding Institute

(PBI is a separate Research Institute and part of the School of Land, Water and Crop Sciences)
Cobbitty
Phone: (02) 9351 8800 or (02) 4655 0800
Fax: (02) 9351 8875
Email: bettyg@camden.usyd.edu.au
Plant Breeding Institute - Cobbitty
Director and Professor of Plant Breeding
vacant
Honorary Professor in Cereal Genetics and Cytogenetics
Robert A Mcintosh, MScAgr PhD. Appointed 1993
Adjunct Professor in Industrial Plant Breeding
NF Derera, AM DipAgrSc Royal Jozef Nador DipPlt Breeding *UofTech Budapest,* FAIAS

Adjunct Professor in Cereal Quality
W Rathmell, MA *Camb,* PhD *Camb*
Associate Professor
Peter J Sharp, BAgSc PhD *Adel*
Senior Lecturers
Norman L Darvey, PhD *UNSW BSc* Ilze Dalins, MSc
Acting Director of Rust Research
Robert F Park, BSc L a i PhD *Qld*
Senior Research Fellow
Harbans S Banana, MScAgr *Punj* PhD
Research Fellows
Mohammad Reza Shariflou, BAgSc MAnSc *Tehran* PhD
Matthew Turner, BScAgr PhD
Postdoctoral Fellow
Matthew Hayden, BSc Tas PhD
Xiaochun Zhao, BagSc Yau PhD
Nizam Ahmed, BScAgr Bangl A U MScAgr PhD
Honorary Research Associates
R Appels, BSc PhD *Adel*
JL Davidson, MAgSc *Adel* PhD *Nott*
John D Oates, OAM, BScAgr

Plant Breeding Institute - Narrabri

Acting Director, IA Watson Grains Research Centre
Frank WH Ellison, MScAgr PhD
Postdoctoral Fellows
Shakir Shah, BSc *Rawalpindi* MSc *Faisalabad* PhD *Calif*
Meredith Herring, BScAgr PhD
Honorary Research Associate
Lindsay O'Brien, MScDipEd *Melb* PhD *Manit*
Professional Officer Grade HI
Stephen G Moore, BSc *NE*

Veterinary Science/Animal Science

Sub Dean, Agriculture Teaching: Dr Michelle Hyde
Phone: (02) 9351 2716
Fax: (02) 9351 2114
Email: michelle@vetsci.usyd.edu.au
Web: www.usyd.edu.au/vetfac/

Sydney

Professor
David Ross Fraser, PhD *Camb* B VSc. Appointed 1986
Gareth Evans, BA *Oxf PhD.* Appointed 2002
Frank W Nicholas, PhD *Edin* BScAgr. Appointed 2002
Associate Professors
David L Evans, B VSc PhD
Chis Maxwell, BScAgr PhD
Christopher Moran, PhD *ANU* BSc
Senior Lecturer
Michelle L Hyde, BScAgr PhD
Paul McGreevy, B VSc PhD *Brist*
Rosanne M Taylor, BVSc PhD
Lecturers
Melanie Collier, BSc PhD *Leeds*
Susan Hemsley, MVSc PhD

Camden

Associate Professor
Peter C Wynn, MRurSc DipEd *NE* PhD
Senior Lecturer
David McNeill, BRurSc PhD *WAust*
Administrative Assistant
Elizabeth Thomas

Molecular and Microbial Biosciences

Microbiology - relevant teaching staff

Phone: (02) 9351 2536
Fax: (02) 93514571
Email: hod.micro@microbio.usyd.edu.au
Web: www.microbio.usyd.edu.au
Professor
Peter Richard Reeves, BSc PhD *Lond,* MASM. Appointed 1985
Reader
Thomas Ferenci, BSc *Lond.* PhD *Leic*
Senior Lecturers
Deidre A Carter, BSc *Otago* PhD *Lond*
Peter B New, BAgrSc *Tas* PhD *Adel,* MASM
Lecturer
Helen M Agus, MSc *UNSW,* MASM

2 Undergraduate degrees

■ Brief introduction to degree courses

Bachelor of Agricultural Economics

(Part-time study, day time only, may be available in certain circumstances)

Assumed knowledge: Mathematics.

The focus of the 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 project reports or research exercises. A wide range of optional courses is available.

Major studies: Include: accounting, agribusiness management, agricultural economics, agricultural science, applied marketing, applied trade, agricultural policy, commercial law, econometrics, economics, finance, geography, government, marketing, modern languages, natural resource economics.

Professional experience: You must complete 18 weeks of approved professional experience and field excursions before graduation. 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 and The Agribusiness Association of Australia.

Career opportunities: Graduates have been employed as applied economists and researchers with: commodity and futures brokers, merchant banks and trading banks; Department of Agriculture, Fisheries and Forestry, ABARE, Meat and Livestock Australia, Productivity Commission, the FAO, the OECD and the World Bank; accounting firms; management consultants with international agencies; agribusiness firms; the wider business community; large corporate farms; and economic journalism.

Bachelor of Animal Science

(Part-time study, day time only, may be available in certain circumstances)

Assumed knowledge: Mathematics, Chemistry and Biology.

Major studies: will include, animal genetics, animal nutrition, animal reproduction, animal structure and function, cattle science and production, equine science and management, pig and poultry science and production, sheep science and production, animal health and diseases, animal behaviour and welfare, animal biotechnology, molecular biology, aquaculture and wildlife.

Professional experience: 18 weeks of approved professional experience and field excursions. Overseas experience is encouraged.

Professional recognition: Graduates are eligible for membership of professional societies.

Career opportunities: Examples include practice, management or research in: conservation of endangered species, zoo animal science, native animal research, animal health and quarantine, sustainable agriculture, animal breeding, agronomy, animal nutrition, molecular genetics (animal and human), forensic science (animal and human), the pharmaceutical industry, medical research, reproductive technology (animal and human), biotechnology (animal and microbial), microbiology, food science, intensive and extensive animal production enterprises, horse, cattle and sheep studs, rural consultancy and extension (domestic and international), marketing, agricultural and veterinary chemicals, media and journalism, National Parks and Wildlife, secondary and tertiary education.

Additional information: The new Bachelor of Animal Science degree involves study of the structure and function of animals, their management and welfare in an agricultural, para-veterinary, laboratory or wildlife context. Its scope is wide and students require a sound education in general science together with in-depth knowledge of fields specifically relevant to animal science and production. Students learn how to apply the knowledge and principles of science to the understanding and management of the production, processing and marketing of animal products and to the management and conservation of our natural resources, including native and endangered species. Emphasis is placed on the development of analytical, quantitative, computing and communication skills, as well as practical animal handling and management. Specialist research skills are gained in the fourth year through the completion of a research project.

This degree provides an excellent alternative to Veterinary Science for students seeking a professional career working with animals. It covers a wide spectrum of aspects in animal production, health and management.

Bachelor of Land and Water Science

(Part-time study, day time 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: will include basic and applied aspects of biology, chemistry, ecology, geography, geographic information systems, geology, hydrology, soil science, statistics, sustainable agriculture and resource economics relevant to land and water science.

Professional experience: Completion of approved professional experience and field excursions before graduation will be a requirement of the course.

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

Bachelor of Horticultural Science

(Part-time study, day time 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, postharvest 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: Includes production horticulture, postharvest biology and technology of horticulture crops, urban horticulture and their environmental impact; soil science, agricultural chemistry, agricultural economics, agricultural entomology, agricultural genetics, agricultural microbiology, agronomy, biometry, plant pathology.

Professional experience: You must complete 18 weeks approved professional experience and field excursions with a focus towards horticultural production industries (temperate, sub-tropical and tropical). Overseas experience is encouraged.

Professional recognition: For admission to 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, postharvest 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 Resource Economics

(Part-time study, day time only, may be available)

Assumed knowledge: Extension 1 Mathematics and Chemistry.

Major studies: For example, environmental economics, bio-economic modelling, commodity trade and market analysis, fishery economics, forestry economics, minerals and energy economics.

Professional experience: You must complete 18 weeks approved professional experience and field excursions. Overseas experience is encouraged.

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

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: A unique applied economics degree which blends a basic science foundation with a strong disciplinary base in economics. Units are drawn from Economics, Agriculture and Science. All students will take a year 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 sub-field of economics.

The focus is in developing broadly applicable analytical economic skills complemented with an adequate knowledge of ecological and other 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, fishery and forestry economics, ecosystems, conservation issues, and sustainability.

Bachelor of Science in Agriculture

(Part-time study, day time 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 chemistry, agricultural economics, agricultural entomology, agricultural genetics, agricultural microbiology, agribusiness, agronomy, animal production, biometry, cereal science, horticultural science, plant pathology, resource economics, soil science. Special interdisciplinary programs may also be approved in fourth year.

Professional experience: You must complete 18 weeks of approved professional experience and field excursions before graduation.

Professional recognition: Professional membership of The Australian Institute of Agricultural Science.

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, molecular genetics (plant, animal and human), forensic science (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 service and the forestry commissions; educators; applied marketing and agribusiness management.

Unit of study details for each degree course can be found in the units of study descriptions chapters of this book.

■ 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 must provide compelling evidence as to why you should be re-admitted to that unit of study and/or degree (see 'satisfactory progress' in Chapter 8). Students repeating units of study which belong to the First, Second or Third Year groups of units of study and 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:

(i) 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;
(ii) you have fulfilled all of the prerequisites; and
(iii) 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 departments as to the waivers which may be granted for each unit. The approval of the Head of Department must be obtained before you can proceed to a unit of study unless you have passed the necessary prerequisites.

Bachelor of Agricultural Economics

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
The degree of Bachelor of Agricultural Economics is available for those wishing to specialise in the field of agricultural economics. Regulations governing candidature of the BAgrEc degree are set out in the Resolutions (see chapter 8). The degree requires a minimum time of four years. The units of study prescribed are summarised below.			
Year 1			
AGEC 1001 Agricultural Economics 1A	6	A HSC Mathematics.	1
AGEC 1002 Agricultural Economics 1B	6	A HSC Mathematics. C AGEC 1001.	2
ECMT 1013 Econometrics 1A Stream 3	6	A HSC Mathematics 2U. N MATH 1005, MATH 1905.	1,2, Summer
ECMT 1023 Econometrics 1B Stream 3	6	A Mathematics. c ECMT 1013. N MATH 1005, MATH 1905. *NB: Other than in exceptional circumstances, it is strongly recommended that students do not undertake Econometrics 1B before attempting 1A*	2, Summer
ECON 1001 Introductory Microeconomics	6	A Mathematics.	1, Summer
ECON 1002 Introductory Macroeconomics	6	A Mathematics.	2, Summer
and 12 credit points from Table 1			
Year 2			
AGEC 2001 Commodity Price Analysis 2	8	P AGEC 1002 or(AGEC 1003 andAGEC 1004) or ECON 1001.	1
ECON 2001 Intermediate Microeconomics	8	p ECON 1001. C ECMT 1010. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Head, Discipline Discipline.*	1, Summer
ECON 2002 Intermediate Macroeconomics	8	P ECON 1002. C ECMT 1020. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Head, Economics Discipline.*	2, Summer
AGEC 2003 Production Economics 2	8	p AGEC 1001 or AGEC 1031 or ECON 2001 or (AGEC 1003 and AGEC 1004).	2
AGEC 2005 Applied Commodity Modelling 2	4	P (ECMT 1010 and ECMT 1020) or (MATH 1001 and 1002 and 1003 and 1005). N AGEC 2006 and AGEC 2007.	1
or AGEC 2006 and AGEC 2007 and a minimum of 12 credit points from Table 1 and/or Table 2.			
Year 3			
AGEC 3001 Agribusiness Management 3	8	P AGEC 2003 or (AGEC 1003 and AGEC 1004).	1,2
AGEC 3002 Agricultural and Resource Policy	8	p (AGEC 2001 & AGEC 2003) or ECON 2001 or ECON 2901.	2
AGEC 3004 Research Methods 3	4	P AGEC 2003 and AGEC 2002 or AGEC 2005 or (AGEC 2006 and AGEC 2007) or ECMT 2021.	2
Plus two units of level 3 ECON, 8 credit points each. Prerequisite: ECON 2001, ECON 2002. and a minimum of 12 credit points from Table 2.			
Year 4			
AGEC 4012 Research Project 4A	8	P AGEC 3003 or AGEC 3004. C AGEC 4013 and any other 24 credit points from AGEC Level 4000 units.	1,2
AGEC 4013 Research Project 4B	8	p AGEC 3003 or AGEC 3004. c AGEC 4012 and any other 24 credit points from AGEC Level 4000 units.	1,2
AGEC 4010 Contemporary Issues 4A	4	C AGEC 4011 and at least 12 other level 4 AGEC credit points.	1
AGEC 4011 Contemporary Issues 4B	4	c AGEC 4010 and at least 12 other level 4 AGEC credit points.	2
Plus at least 24 credit points from the following six units:			
AGEC 4003 Apphed International Trade	8	p AGEC 2001 or (ECON 2001 and ECON 2002) or (ECON 2901 and ECON 2902).	1
AGEC 4004 Applied Marketing	8	p AGEC 2001 or (AGEC 1003 & AGEC 1004) or ECON 2001 or ECON 2901.	2
AGEC 4005 Natural Resource Economics	8	p (AGEC 2001 and AGEC 2003) or (ECON 2001 and ECON 2002).	2
AGEC 4008 Quantitative Planning Methods 4	4	p AGEC 2003. c AGEC 3001 or AGEC 3031.	1
AGEC 4009 Agricultural Finance & Risk Management 4	4	P AGEC 2003. c AGEC 3001 or AGEC 3031.	1
AGEC 4007 Spec Topics Agricult/Resource Economics	8	*NB: Permission required for enrolment.*	1,2

Bachelor of Agricultural Economics (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
Optional units of study in the BAgrEc degree			
■ **Table 1**			
ACCT 1001[1] Accounting IA	6	A HSC Mathematics. *NB: Restricted entry (code 511500 or 521500 or 511503 or 521503 or Combined Commerce).*	1,2
ACCT 10022 Accounting IB	6	p ACCT 1001. *NB: Restricted entry (code 511500 or 521500 or 511503 or 521503 or Combined Commerce).*	1,2, Summer
ACCT 1003[1] Financial Accounting Concepts;	6	N Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002.	1
ACCT 1004[2] Management Accounting . Concepts	6	N Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002.	2
BIOL 1001 Concepts in Biology	6	A HSC Biology. N May not be counted with BIOL 1901 or 1500.	1, Summer
BIOL 1002 Living Systems	6	A HSC 2-unit Biology course. N May not be counted with BIOL 1902 or 1500.	2
CROP 1001 Agricultural Science IA	6	A HSC Chemistry. N HORT 1001, LWSC 1001.	1
CROP 1002 Agricultural Science IB	6	c CROP 1001. N HORT 1002, LWSC 1002.	2
CLAW 1001 Commercial Transactions A	6		1,2
CLAW 1002 Commercial Transactions B	6	p CLAW 1001.	2
GEOG 1001 Biophysical Environments	6		1
GEOG 1002 Human Environments	6		2
First year GOVT.			
MATH 1011 Life Sciences Calculus	3	A HSC Mathematics. N May not be counted with MATH 1001 or 1901 or 1906. May not be counted by students enrolled in the BSc/BCom combined award course.	1
MATH 1012 Life Sciences Algebra	3	A HSC Mathematics. N May not be counted with MATH 1002 or 1902. May not be counted by students enrolled in the BSc/BCom combined award course.	2
MATH 1013 Differential and Difference Equations	3	A HSC Mathematics. N May not be counted with MATH 1003 or 1903 or 1907. May not be counted by students enrolled in the BSc/BCom combined award course.	2
MATH 1015 Life Science Statistics	3	A HSC Mathematics. N May not be counted with MATH 1905 or 1005 or STAT 1021 or 1022. May not be counted by students enrolled in the BSc/BCom combined award course.	1, Summer

Modem Language (level 1) units with the approval of the Dean of Agriculture.

Notes

1. ACCT 1001 and ACCT 1003 are mutually exclusive.
2. ACCT 1002 and ACCT 1004 are mutually exclusive.

Students may count no more than 24 credit points of the following units of study towards the degree: First year units in Accounting, Agricultural Science, Biology, Commercial Law, Geography, Government, and Mathematics (Life Sciences). Students may not count both Accounting IA and IB, and Financial Accounting Concepts and Management Accounting Concepts towards their degree.

■ Table 2			
AGEC 4008 Quantitative Planning Methods 4	4	**p** AGEC 2003. c AGEC 3001 or AGEC 3031.	1
AGEC 4009 Agricultural Finance & Risk Management 4	4	**p** AGEC 2003. c AGEC 3001 or AGEC 3031.	1
AGRO 3001 Agronomy 3	8	**P** AGRO 2002 or CROP 1001 or HORT 1001 or LWSC 1001.	1
ANSC 2003 Animal Science 2 for Agr Economics	4		2
ASNS 2601 Asian Studies 1A	4		1
ASNS 2602 Asian Studies 1B	4	**p** ASNS 2601.	2
ASNS 2603 Asian Studies 2A	4	**p** ASNS 2602.	1
ASNS 2604 Asian Studies 2B	4	**p** ASNS 2603.	2
ASNS 3601 Asian Studies 3A (Japanese)	4	**p** ASNS 2604.	1
ASNS 3602 Asian Studies 3B (Japanese)	4	**p** ASNS 3601.	2
ECMT 2010 Regression Modelling	8	**p** ECMT 1010 and ECMT 1020.	1

Bachelor of Agricultural Economics (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
ECMT 2021 Analysis of Discrete Choice Data	8	P ECMT 2010.	N/A in 2002
HORT 3001 Horticultural Science 3	8	P CROP 2001 or HORT 2001 or AGRO 2002.	1

Any level 2 semester units of study in Economic History (ECHS) or Government (GOVT).
Any level 2 or 3 semester units of study in Accounting (ACCT), Commercial Law (CLAW), Finance (FTNC), Geography (GEOG), Marketing (MKTG), Modern Language (with approval of the Dean).
Any level 3 semester units of study in Econometrics (ECMT), Economics (ECON).
Units of study from the BScAgr or BHortSc degree, subject to the approval of the Head of Department or Agricultural Economics and the Head of the Department concerned.

Bachelor of Horticultural Science

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
The degree of Bachelor of Horticultural Science is available for those wishing to specialise in the field of horticultural science. Regulations governing candidature of the BHortSc degree are set out in the Resolutions (see chapter 8). The degree requires a niinirnum time of four years. The units of study prescribed are summarised below.			
Year 1 (commenced 1995, revised 1997)			
ENTO 1001 Agricultural Entomology 1	4		2
HORT 1001 Horticultural Science 1A	6	A HSC 2 unit Chemistry or 3 unit Science. N CROP 1001, LWSC1001.	1
HORT 1002 Horticultural Science 1B	6	C HORT 1001. N CROP 1002, LWSC 1002.	2
BIOL 1201 Biology - Agricultural Concepts	4	A HSC 2 unit Biology.	1
BIOL 1202 Biology -Agricultural Systems	5	A BIOL 1201 or HSC 2 unitBiology.	2
BIOM 1001 Biometry 1	5	A HSC Mathematics.	1
AGEC 1003 Economic Environment of Aust Agric 1A	3	A HSC Mathematics.	1
AGEC 1004 Economic Environment of Aust Agric 1B	3	A HSC Mathematics. C AGEC 1003.	2
CHEM 1001 Fundamentals of Chemistry 1A	6	A There is no assumedknowledge 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. N May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002 Fundamentals of Chemistry 1B	6	P CHEM 1001 or 1101 or equivalent. N May not be counted with CHEM 1102 or 1902 or 1904 or 1907 or 1908.	2
or			
CHEM 1901 Chemistry 1A (Advanced)	6	P UAI of at least 93 and HSC Chemistry result in the 80th percentile or better, or Distinction or better in a University level Chemistry unit, or by invitation. c Recommended concurrent unit of study: 6 credit points of Junior Mathematics. N May not be counted with CHEM 1001 or 1101 or 1903 or 1905 or 1906 or 1909. *NB: Permission required for enrolment.*	▪1
CHEM 1902 Chemistry 1B (Advanced)	6	Q CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent. C Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH 1003 or 1903. N May not be counted with CHEM 1002 or 1102 or 1904 or 1907 or 1908. *NB: Permission required for enrolment Entry is by invitation.*	2
Year 2			
AGCH 2002 Agricultural Chemistry 2	8	P CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry.	1
GENE 2001 Agricultural Genetics 2	6	P BIOL 1201 and BIOL 1202 or BIOL 1001 and BIOL 1002, BIOM 1001.	2
MICR 2101 Agricultural Microbiology 2	6	P First year Biology, First year Chemistry or Chemistry 1 Advanced.	1
HORT 2001 Horticultural Science 2	6	P HORT 1001 & HORT 1002 or CROP 1001 and CROP 1002 ot LWSC 1001 and LWSC 1002. C CROP 2001.	2
BIOM 2001 Biometry 2	6	P BIOM 1001 or BIOM 1002.	2
CROP 2002 Crop Protection 2	4	P CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOL 1001 and BIOL 1002 orl003, or BIOL 1201 and 1202. C MICR 2101.	1
CROP 2001 Crop Science 2	6	p CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOM lOOlorBIOM 1002. c AGCH 2002.	2
SOIL 2003 Soil Science 2	6		1

Bachelor of Horticultural Science (continued)

Unit of study		CP	A Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
Year 3				
The normal load for Year 3 is 48 credit points.				
AGEC 3001	Agribusiness Management 3	8	**p** AGEC 2003 or (AGEC 1003 and AGEC 1004).	1,2
AGCH 3017	Food Chemistry and Biochemistry A	4	**P** AGCH 2001 or AGCH 2002 or BCHM (2002 or 2902) or BMED (2501 and 2502 and 2504). **N** May not be counted with AGCH 3003 or 3005.	
AGCH 3018	Food Chemistry and Biochemistry B	4	**C** AGCH 3017. **N** May not be counted with AGCH 3003 or 3005.	
AGRO 3001	Agronomy 3	8	**P** AGRO 2002 or CROP 1001 or HORT 1001 orLWSC 1001.	
BIOM 3002	Experimental Design 3	4	**P** BIOM 2001 or BIOM 2002. **N** BIOM 3001.	
BIOM 3003	Statistical Modelling 3	4	**P** BIOM 2001 or BIOM 2002. **N** BIOM 3001.	
AGEC 2001	Commodity Price Analysis 2	8	**P** AGEC 1002 or (AGEC 1003 and AGEC 1004) or ECON 1001.	
HORT 3001	Horticultural Science 3	8	**P** CROP 2001 or HORT 2001 or AGRO 2002.	
HORT 3003	Postharvest Biology and Technology 3	4	**P** CROP 2001 or HORT 2001 or AGRO 2002.	
AGCH 3012	Rural Environmental Chemistry	4	**P** AGCH 2002 or ENVI 2001 and 2002. *NB: This unit is offered to students enrolled in BSc(Environmental), BLWSc and, subject to numbers, may be available to BScAgr. A maximum quota of 30 may exist. Contact Professor Kennedy.*	
AGCH 3016	Agricultural Biotechnology 3	4	A AGCH 2002, GENE 2001, MICR 2101, ANSC 2002 and CROP 2001, or the equivalent of these units.	2
CROP 3003	Agricultural Systems for Hort Science 3	4	N CROP 3002.	2
AGEC 4004	Applied Marketing	8	p AGEC 2001 or (AGEC 1003 & AGEC 1004) or ECON 2001 or ECON 2901.	2
AGCH 3020	Chemistry & Biochemistry of Ecosystems A	4	p AGCH 2001 or AGCH 2002 or CHEM (2001 or 2101 or 2202 or 2301 or 2302 or 2902) or BCHM (2002 or 2902) or ENVI (2001 or 2002). N May not be counted with AGCH 3001 or 3004.	2
AGCH 3021	Chemistry & Biochemistry of Ecosystems B	4	c AGCH 3020. N May not be counted with AGCH 3001 or 3004.	2
HORT 3002	Flower and Nursery Crops 3	4	p CROP 2001 or HORT 2001 or AGRO 2002.	2
PPAT 3002	Plant Disease 3	4	p CROP 2001, CROP 2002, GENE 2001.	2
AGEC 2003	Production Economics 2	8	P AGEC 1001 or AGEC 1031 or ECON 2001 or (AGEC 1003 andAGEC 1004).	2
SOIL 3003	Soil Science 3	8	p SOIL 2003.	2
Year 4				
HORT 4001	Horticultural Science 4A	24	P HORT 3001.	1
HORT 4002	Horticultural Science 4B	24	P HORT 3001.	2

Bachelor of Land and Water Science

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
Regulations governing candidature of the BLWSc degree are set out in the Resolutions (see chapter 8). The degree requires a minimum time of four years. The units of study prescribed are summarised below.				
Year 1 (commenced 2000)				
BIOM 1002	Environmetrics 1	6	A HSC Mathematics.	2
BIOL 1001	Concepts in Biology	6	A HSC Biology. N May not be counted with BIOL 1901 or 1500.	1, Summer
ENVI 1001	Global Geology	6		1
ENVI 1002	Geomorphic Environments and Change	6		2
LWSC 1001	Land and Water Science 1A	6	N CROP 1001 and HORT 1001.	1
LWSC 1002	Land and Water Science 1B	6	C (LWSC 1001) Land and Water Science IA. N CROP 1002 and HORT 1002.	2

Bachelor of Land and Water Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
And 12 credit points from Year 1 Chemistry.				
CHEM 1001	Fundamentals of Chemistry IA	6	A 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. N May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002	Fundamentals of Chemistry IB	6	p CHEM 1001 or 1101 or equivalent. N May not be counted with CHEM 1102 or 1902 or 1904 or 1907 or 1908.	2
Or from standard level CHEM 1101 Chemistry IA and CHEM 1102 Chemistry IB Or from advanced level CHEM 1901 Chemistry IA (Advanced) and CHEM 1902 Chemistry IB (Advanced).				
Year 2				
BIOM 2002	Environmetrics 2	4	p BIOM 1002 or BIOM 1001.	2
AGCH 2002	Agricultural Chemistry 2	8	P CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry.	1
BIOL 2004	Plant Ecology and Diversity	8	Q BIOL (1001 or 1901) and eitherBIOL (1002 or 1902 or 1003 or 1903) orLWSC1002 or EDUH1016 (for BEd (Secondary) (Human Movement and Health Education)). C MICR 2013 for BLWSc. N May not be counted with BIOL 2904. *NB: The completion ofMBLG2001 or 2101 or 2901 is highly recommended. The content of Biology 1002/1902 is assumed knowledge and students entering from BIOL 1003 or 1903 will need to do some preparatory reading. Students taking this unit concurrently with (orfollowing completion of) BIOL 2001 or 2901 or 2006 or 2906 must complete 32 hours of alternative work in one unit, in place of the core material common to both units and if taking the units concurrently, must elect at enrolment in which unit they wish to do the alternative work.*	1
GEOG 2303	Fluvial and Groundwater Geomorphology	8	P GEOG 2001 or 36 credit points of Junior study including GEOG 1001 or ENVI 1001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology, Chemistry and Mathematics. N May not be counted with GEOG 2002 or GEOG 2302. *NB: Other Information: as for GEOG 2001.*	2
LWSC 2001	Land and Water Science 2	4	*p* LWSC 1001 and LWSC 1002.	2
MICR 2013	Introductory Microbiology 2	4	p BIOL 1001 or BIOL 1201, LWSC 1002 or CROP 1002 or HORT1002,12 credit points of First Year Chemistry. N MICR 2003, MICR 2001.	1
SOIL 2003	Soil Science 2	6		1
And a 6 credit point elective chosen from:				
ANSC 2002	Animal Science 2	6	p CROP1001andCROP1002orHORT1001andHORT1002orLWSC1001andLWSC 1002. c AGCH 2002.	2
CROP 2001	Crop Science 2	6	p CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOM lOOlorBIOM 1002. c AGCH 2002.	2
Year 3				
The load for Year 3 is 48 credit points.				
AGEC 3032	Introductory Land and Water Economics 3	4		1
AGCH 3020	Chemistry & Biochemistry of Ecosystems A	4	p AGCH 2001 or AGCH 2002 or CHEM (2001 or2101 or 2202 or 2301 or2302or2902) or BCHM (2002 or 2902) or ENVI (2001 or 2002). N May not be counted with AGCH 3001 or 3004.	2
AGRO 3001	Agronomy 3	8	p AGRO 2002 or CROP 1001 or HORT 1001 orLWSC 1001.	1
ENVI 3004	Environmental Impact Assessment	4	p Entry by permission of Course Coordinator only. N May not be counted with ENVI 3002. *NB: Permission required for enrolment. Available for Study Abroad students and students enrolled in Land and Water Science only.*	2
LWSC 3001	Hydrology and Catchment Management 3	4	*p* LWSC 2001 or GEOG 2302 or GEOG 2303.	1
RSIS 3001	Rural Spatial Information Systems 3	4	p SOIL 2003, BIOM 2001 or BIOM 2002.	1
SOIL 3003	Soil Science 3	8	p SOIL 2003.	2
And 12 credit points of electives chosen with the approval of the course coordinator from Ecology, Land Science, Water Science, Biophysical Modelling, Socioeconomics or Political Systems.				
ENVI 3003	Law and the Environment	4	p Entry by permission of Course Coordinator only. N May not be counted with ENVI 3001. *NB: Permission required for enrolment. Available for Study Abroad students and students enrolled in Land and Water Science only.*	1

Bachelor of Land and Water Science (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
Year 4			
The load for Year 4 is 48 credit points.			
LWSC 4001 Planning and Communicating Policy		*This 4 credit point unit of study is planned for 2003.*	
LWSC 4002 Project/Case Study		*This 24 credit point unit of study is planned for 2003.*	
And 16 credit points of electives chosen with the approval of the course coordinator from Ecology, Land Science, Water Science, Biophysical Modelling, Socioeconomics or Political Systems.			

Bachelor of Resource Economics

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
Regulations governing candidature of the BResEc degree are set out in the resolutions (see chapter 8). The degree requires a minimum time of four years. The units of study prescribed are summarised below.			
Year 1 (commenced 2000)			
The load for Year 1 is 48 credit points.			
AGEC 1031 Resource Economics 1	6	A HSC 3 unit Mathematics or Mathematics Extension 1. C ECON 1001.	2
ECON 1001 Introductory Microeconomics	6	A Mathematics.	1, Summer
And 12 credit points from standard Biology or• Land and Water Science.			
BIOL 1001 Concepts in Biology	6	A HSC Biology. N May not be counted with BIOL 1901 or 1500.	1, Summer
And			
BIOL 1002 Living Systems	6	A HSC 2-unit Biology course. N May not be counted with BIOL 1902 or 1500.	2
Or from advanced level BIOL 1902 and BIOL 1902; Or			
LWSC 1001 Land and Water Science 1A	6	N CROP 1001 andHORT 1001.	1
LWSC 1002 Land and Water Science 1B	6	C (LWSC 1001) Land and Water Science IA. N CROP 1002andHORT 1002.	2
and 12 credit points from Year 1 Chemistry.			
CHEM 1001 Fundamentals of Chemistry 1A	6	A 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. N May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002 Fundamentals of Chemistry 1B	6	p CHEM 1001 or 1101 or equivalent. N May not be counted with CHEM 1102 or 1902 or 1904 or 1907 or 1908.	2
Or from standard level CHEM 1101 Chemistry IA and CHEM 1102 Chemistry IB; Or from advanced level CHEM 1901 Chemistry IA (Advanced) and CHEM 1902 Chemistry IB (Advanced); And 12 credit points from standard level Mathematics.			
MATH 1001 Differential Calculus	3	A HSC Mathematics Extension 1. N May not be counted with MATH 1011 or 1901 or 1906.	1, Summer
MATH 1002 Linear Algebra	3	A HSC Mathematics Extension 1. N May not be counted with MATH 1902 or 1012.	1, Summer
MATH 1003 Integral Calculus and Modelling	3	A HSC Mathematics Extension 2 or MATH 1001. N May not be counted with MATH 1013 or 1903 or 1907.	2, Summer
MATH 1005 Statistics	3	A HSC Mathematics. N May not be counted with MATH 1905 or 1015 or ECMT 1010 or 1020 or STAT 1021 or 1022.	2, Summer
Or from advanced level MATH 1901, MATH 1902, MATH 1903, MATH 1905.			
Year 2			
The load for Year 2 is 48 credit points.			
AGEC 2001 Commodity Price Analysis 2	8	P AGEC 1002 or (AGEC 1003 and AGEC 1004) or ECON 1001.	1
AGEC 2003 Production Economics 2	8	P AGEC 1001 or AGEC 1031 or ECON 2001 or (AGEC 1003 and AGEC 1004).	2
AGEC 2005 Applied Commodity Modelling 2	4	P (ECMT 1010 and ECMT 1020) or (MATH 1001 and 1002 and 1003 and 1005). N AGEC 2006 and AGEC 2007.	1
ECON 1002 Introductory Macroeconomics	6	A Mathematics.	2, Summer
ECON 2001 Intermediate Microeconomics	8	P ECON 1001. c ECMT 1010. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Head, Discipline Discipline.*	1, Summer

Bachelor of Resource Economics (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
GEOG 2001 Processes in Geomorphology	8	p 36 credit points of Junior units of study, including GEOG 1001 or ENVI 1001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mauiematics.	1
GEOG 2302 Fluvial Geomorphology	6	P GEOG 2001 or 36 credit points of Junior units of study including GEOG 1001 or ENVI 1001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of Junior units of study in Biology, Chemistry and Mathematics. N May not be counted with GEOG 2002 or 2303. *NB: Other Information: as for GEOG 2001.*	2
Or			
GEOG 2002 Fluvial and Coastal Geography	8	P 36 credit points of Junior units of study, including GEOG 1001 or ENVI 1001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. N May not be counted with GEOG 2302 or 2303 or MARS 2002. *NB: Other Information: As for GEOG 2001.*	2

Year 3

The load for Year 3 is 48 credit points.

AGEC 3002 Agricultural and Resource Policy	8	P (AGEC 2001 &AGEC2003) or ECON 2001 or ECON 2901.	2
AGEC 3031 Resource Economics 3	8	P AGEC 2003.	. 1
ECON 2002 Intermediate Macroeconomics	8	P ECON 1002. c ECMT 1020. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Head, Economics Discipline.*	2, Summer

ECON 3000 level (option)
Plus 16 credit points chosen from Table 1 below.

Year 4

The load for Year 4 is 48 credit points.

AGEC 4031 Resource Economics Project 4	*A 12 credit point project is planned for 2003.*
AGEC 4041 Research Methods 4	*This 4 credit point unit of study is planned for 2003.*

ECON 3000 level (option)
Plus 12 credit points chosen from Table 3 below, and additional unit(s) if necessary, chosen from Table 2 below.

Elective units of study in the BResEc degree

■ Table 1: Electives for Year 3 students

Units of study in the following discipline areas (level 2 unless otherwise specified):
Agricultural Economics (level 3)
Agricultural Chemistry
Animal Science
Biology
Chemistry
Crop Science
Economics (level 2 or 3)
Environmental Science
Geography (level 2 or 3)
Geology
Land and Water Science
Mathematics
Marine Science
Resource Eonomics (level 3)
Soil Science.

■ Table 2: Electives for Year 4 students

Units of study in the following discipline areas (level 2 or 3 unless otherwise specified):
Agricultural Economics (level 3 or 4)
Agricultural Chemistry
Animal Science
Biology
Chemistry
Crop Science
Economics
Environmental Science
Geography
Geology
Land and Water Science
Mathematics
Marine Science
Resource Eonomics (level 3 or 4)
Soil Science.

■ Table 3: Resource Economics electives for Year 4 students

AGEC 4032 Methods of Non-Market Valuation 4	*This 4 credit point unit of study is planned for 2003.*
AGEC 4033 Minerals and Energy Economics 4	*This 4 credit point unit of study is planned for 2003.*

Bachelor of Resource Economics (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
AGEC 4034 Renewable Resource Economics		*This 4 credit point unit of study is planned for 2003.*	
AGEC 4035 Environmental Economics 4		*This 4 credit point unit of study is planned for 2003.*	
AGEC 4036 Water Economics 4		*This 4 credit point unit of study is planned for 2003.*	

Bachelor of Science in Agriculture

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester

The degree of Bachelor of Science in Agriculture is available for those wishing to cover the whole field of agricultural science. Regulations governing candidature for the BScAgr degree are set out in the resolutions (see chapter 8). The degree requires a minimum time of four years. The units of study prescribed are summarised below.

Year 1 (commenced 1995, revised 1997)

ENTO 1001 Agricultural Entomology 1	4		2
CROP 1001 Agricultural Science 1A	6	A HSC Chemistry. N HORT 1001, LWSC 1001.	1
CROP 1002 Agricultural Science 1B	6	C CROP 1001. N HORT 1002, LWSC 1002.	2
BIOL 1201 Biology-Agricultural Concepts	4	A HSC 2 unit Biology.	1
BIOL 1202 Biology - Agricultural Systems	5	A BIOL 1201 or HSC 2 unitBiology.	2
BIOM 1001 Biometry 1	5	A HSC Mathematics.	1
AGEC 1003 Economic Environment of Aust Agric 1A	3	A HSC Mathematics.	1
AGEC 1004 Economic Environment of Aust Agric 1B	3	A HSC Mathematics. c AGEC 1003.	2
CHEM 1001 Fundamentals of Chemistry 1A	6	A There is no assumed knowledge of chemistry fortius 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. N May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002 Fundamentals of Chemistry 1B	6	p CHEM 1001 or 1101 or equivalent. N May not be counted with CHEM 1102 or 1902 or 1904 or 1907 or 1908.	2
Or			
CHEM 1901 Chemistry 1A (Advanced)	6	p UAI of at least 93 and HSC Chemistry result in the 80th percentile or better, or Distinction or better in a University level Chemistry unit, or by invitation. C Recommended concurrent unit of study: 6 credit points of Junior Mathematics. N May not be counted with CHEM 1001 or 1101 or 1903 or 1905 or 1906 or 1909. *NB: Permission required for enrolment.*	1
CHEM 1902 Chemistry 1B (Advanced)	6	*Q* CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent. C Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH 1003 or 1903. N May not be counted with CHEM 1002 or 1102 or 1904 or 1907 or 1908. *NB: Permission required for enrolment. Entry is by invitation.*	2

Year 2

AGCH 2002 Agricultural Chemistry 2	8	p CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry.	1
GENE 2001 Agricultural Genetics 2	6	p BIOL 1201 and BIOL 1202 or BIOL 1001 and BIOL 1002, BIOM 1001.	2
MICR 2101 Agricultural Microbiology 2	6	p First year Biology, First year Chemistry or Chemistry 1 Advanced.	1
ANSC 2002 Animal Science 2	6	p CROP 1001 and CROP 1002 or HORT 1001 and HORT 1002 or LWSC lOOland LWSC 1002. c AGCH 2002.	2
BIOM 2001 Biometry 2	6	p BIOM 1001 or BIOM 1002.	2
CROP 2002 Crop Protection 2	4	p CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOL 1001 and BIOL 1002 orl003, or BIOL 1201 and 1202. C MICR 2101.	1
CROP 2001 Crop Science 2	6	p CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOM lOOlor BIOM 1002. C AGCH 2002.	2
SOIL 2003 Soil Science 2	6		1

Year 3

The normal load for Year 3 is 48 credit points.

AGEC 2001 Commodity Price Analysis 2	8	p AGEC 1002 or (AGEC 1003 and AGEC 1004) or ECON 1001.	1
AGEC 2003 Production Economics 2	8	p AGEC 1001 or AGEC 1031 or ECON 2001 or (AGEC 1003 and AGEC 1004).	2

Bachelor of Science in Agriculture (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
AGEC 3001	Agribusiness Management 3	8	P AGEC 2003 or (AGEC 1003 and AGEC 1004).	1,2
AGEC 4004	Applied Marketing	8	P AGEC 2001 or (AGEC 1003 & AGEC 1004) or ECON 2001 or ECON 2901.	2
AGCH 3016	Agricultural Biotechnology 3	4	A AGCH 2002, GENE 2001, MICR 2101, ANSC 2002 and CROP 2001, or the equivalent of these units.	2
AGCH 3020	Chemistry & Biochemistry of Ecosystems A	4	P AGCH 2001 or AGCH 2002 or CHEM (2001 or2101 or 2202 or 2301 or2302or2902) or BCHM (2002 or 2902) or ENVI (2001 or 2002). N May not be counted with AGCH 3001 or 3004.	2
AGCH 3021	Chemistry & Biochemistry of Ecosystems B	4	C AGCH 3020. N May not be counted with AGCH 3001 or 3004.	2
AGCH 3017	Food Chemistry and Biochemistry A	4	P AGCH 2001 or AGCH 2002 or BCHM (2002 or 2902) or BMED (2501 and 2502 and 2504). N May not be counted with AGCH 3003 or 3005.	1
AGCH 3018	Food Chemistry and Biochemistry B	4	c AGCH 3017. N May not be counted with AGCH 3003 or 3005.	1
AGCH 3012	Rural Environmental Chemistry	4	P AGCH 2002 or ENVI 2001 and 2002. *NB: This unit is offered to students enrolled in BSc(Environmental), BLWSc and, subject to numbers, may be available to BScAgr. A maximum quota of 30 may exist. Contact Professor Kennedy.*	1
MICR 3102	Agricultural Microbiology 3	8	P MICR 2101.	2
CROP 3002[1]	Agricultural Systems & Irrigation Sci 3	8	N HORT 2001and CROP 3003.	2
CROP 3003[1]	Agricultural Systems for Hort Science 3	4	N CROP 3002.	2
AGRO 3001	Agronomy 3	8	P AGRO 2002 or CROP 1001 or HORT 1001 orLWSC 1001.	1
ANSC 3001	Animal Nutrition 3	8	P ANSC2002.	1,2
ANSC 3002	Animal Reproduction 3	8	P ANSC 2002.	2
ANSC 3003	Animal Structure and Function 3A	8	P ANSC 2002.	1
ANSC 3004	Animal Structure and Function 3B	8	P ANSC 2002.	2
ANSC 3005	Animal Biotechnology 3	4	P Students are expected to have knowledge of Genetics equivalent at least to Agricultural Genetics 2 (GENE 2001) and knowledge of Animal Science equivalent to Animal Science 2 (ANSC 2002).	2
BIOM 3002	Experimental Design 3	4	P BIOM 200 1or BIOM 2002. N BIOM 3001.	1
BIOM 3003	Statistical Modelling 3	4	P BIOM 2001 or BIOM 2002. N BIOM 3001.	1
HORT 3001	Horticultural Science 3	8	P CROP 2001 or HORT 2001 or AGRO 2002.	1
HORT 3002	Flower and Nursery Crops 3	4	P CROP 2001 or HORT 2001 or AGRO 2002.	2
HORT 3003	Posfharvest Biology and Technology 3	4	P CROP 2001 or HORT 2001 or AGRO 2002.	1
PPAT 3002	Plant Disease 3	4	P CROP 2001, CROP 2002, GENE 2001.	2
RSIS 3001	Rural Spatial Information Systems 3	4	P SOIL 2003, BIOM 2001 or BIOM 2002.	1
SOIL 3003	Soil Science 3	8	P SOIL 2003.	2

1. CROP 3002 and CROP 3003 are mul:ually exclusive.

Year 4

The load for Year 4 is 48 credit points.

AGEC 4022	Agribusiness 4A	24	P AGEC 3001,24 credit points of 3rd year AgrSc. c AGEC 4023.	1'
AGEC 4023	Agribusiness 4B	24	P AGEC 3001,24 credit points of 3rd year AgrSc. C AGEC 4022.	2
AGCH 4002	Agricultural Chemistry 4A	24	p AGCH3004orAGCH3005orAGCH3020andAGCH3021 or AGCH 3017and AGCH 3018. c AGCH 4003.	1
AGCH 4003	Agricultural Chemistry 4B	24	c AGCH 4002.	2
AGEC 4020	Agricultural Economics 4A	24	P AGEC 2001, AGEC 2003. C AGEC 4021 Agricultural Economics 4B.	1
AGEC 4021	Agricultural Economics 4B	24	P AGEC 2001, AGEC 2003. c AGEC4020.	2
ENTO 4001	Agricultural Entomology 4A	24-	P ENTO 1001. c ENTO 4002.	1
ENTO 4002	Agricultural Entomology 4B	24	p ENTO 1001. C ENTO 4001.	2

Bachelor of Science in Agriculture (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
GENE 4001	Agricultural Genetics 4A	24	**p** BIOM 2001, GENE 2001.	1
GENE 4002	Agricultural Genetics 4B	24	**p** BIOM 2001, GENE 2001. **C** GENE 4001.	2
MICR 4101	Agricultural Microbiology 4A	24	**p** MICR 3102. **C** MICR 4102.	1
MICR 4102	Agricultural Microbiology 4B	24	**p** MICR 3102. **C** MICR 4101.	2
AGRO 4001	Agronomy 4A	24	**p** AGRO 3001.	1
AGRO 4002	Agronomy 4B	24	**p** AGRO 3001. **C** AGRO 4001.	2
ANSC 4001	Animal Production 4A	24	**p** ANSC 3001, ANSC 3002, ANSC 3003.	1
ANSC 4002	Animal Production 4B	24	**p** ANSC 3001, ANSC 3002, ANSC 3003. **C** ANSC 4001.	2
BIOM 4001	Biometry 4A	24	**p** BIOM 3001or BIOM 3002 and BIOM 3003.	1
BIOM 4002	Biometry 4B	24	**C** BIOM 4001.	2
AGCH 4004	Cereal Science 4A	24	**p** AGCH 3005. **C** AGCH 4005.	1
AGCH 400S	Cereal Science 4B	24	**C** AGCH 4004.	2
HORT 4001	Horticultural Science 4A	24	**p** HORT 3001.	1
HORT 4002	Horticultural Science 4B	24	**p** HORT 3001.	2
PPAT 4001	Plant Pathology 4A	24	**p** PPAT 3002.	1
PPAT 4002	Plant Pathology 4B	24	**p** PPAT 3002.	2
AGEC 4024	Resource Economics 4A	24	**p** AGEC 2001, AGEC 2003 and 24 credit points of 3rd year Agr Sc. **C** AGEC 4025.	1
AGEC 4025	Resource Economics 4B	24	**p** AGEC 2001, AGEC 2003 and 24 credit points of 3rd year Agr Sc. **C** AGEC 4024.	2
SOIL 4002	Soil Science 4A	24	**p** SOIL 3003.	1
SOIL 4003	Soil Science 4B	24	**p** SOIL 3003. **C** SOIL 4002.	2
AGRF 4001	Special Program 4A	24	*NB: Permission required for enrolment.*	1
AGRF 4002	Special Program 4B	24	*NB: Permission required for enrolment.*	2

Bachelor of Animal Science

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester

The degree of Bachelor of Animal Science is available for those wishing to specialise in the field of animal science. Regulations governing candidature for the BAnimSc degree are set out in the resolutions (see chapter 8). The degree requires a minimum time of four years. The units of study prescribed are summarised below.

Year 1 (commenced 2002)

ENTO 1001	Agricultural Entomology 1	4		2
CROP 1001	Agricultural Science 1A	6	**A** HSC Chemistry. **N** HORT 1001, LWSC 1001.	1
CROP 1002	Agricultural Science 1B	6	**C** CROP 1001. **N** HORT 1002, LWSC 1002.	2
BIOL 1201	Biology - Agricultural Concepts	4	**A** HSC 2 unit Biology.	1
BIOL 1202	Biology - Agricultural Systems	5	**A** BIOL 1201 or HSC 2 unitBiology.	2
BIOM 1001	Biometry 1	5	**A** HSC Mathematics.	1
AGEC 1003	Economic Environment of Aust Agric 1A	3	**A** HSC Mathematics.	1
AGEC 1004	Economic Environment of Aust Agric 1B	3	**A** HSC Mathematics. **C** AGEC 1003.	2
CHEM 1001	Fundamentals of Chemistry 1A	6	**A** 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. **N** May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002	Fundamentals of Chemistry 1B	6	**P** CHEM 1001 or 1101 or equivalent. **N** May not be counted with CHEM 1102 or 1902 or 1904 or 1907 or 1908.	2

Bachelor of Animal Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Sismester
or				
CHEM 1901	Chemistry 1A (Advanced)	6	P UAI of at least 93 and HSC Chemistry result in the 80m percentile or better, or Distinction or better in a University level Chemistry unit, or by invitation. C Recommended concurrent unit of study: 6 credit points of Junior Mathematics. N May not be counted with CHEM 1001 or 1101 or 1903 or 1905 or 1906 or 1909. *NB: Permission required for enrolment.*	1
CHEM 1902	Chemistry 1B (Advanced)	6	Q CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent. C Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH 1003 or 1903. N May not be counted with CHEM 1002 or 1102 or 1904 or 1907 or 1908. *NB: Permission required for enrolment. Entry is by invitation.*	2
Year 2				
AGCH 2002	Agricultural Chemistry 2	8	P CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry.	1
GENE 2001	Agricultural Genetics 2	6	P BIOL 1201 and BIOL 1202 or BIOL 1001 and BIOL 1002, BIOM 1001.	2
MICR 2101	Agricultural Microbiology 2	6	P First year Biology, First year Chemistry or Chemistry 1 Advanced.	1
ANSC 2002	Animal Science 2	6	P CROP 1001 and CROP 1002 or HORT1001 and HORT1002 or LWSC lOOland LWSC 1002. C AGCH 2002.	2
BIOM 2001	Biometry 2	6	P BIOM 1001 or BIOM 1002.	2
CROP 2002	Crop Protection 2	4	P CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOL 1001 and BIOL 1002 orl003, or BIOL 1201 and 1202. C MICR 2101.	1
CROP 2001	Crop Science 2	6	P CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOM lOOlorBIOM 1002. c AGCH 2002.	2
SOIL 2003	Soil Science 2	6		1
Year 3				
The normal load for Year 3 is 48 credit points.				
AGRO 3001	Agronomy 3	8	p AGRO 2002 or CROP 1001 or HORT 1001 orLWSC 1001.	1
ANSC 3001	Animal Nutrition 3	8	p ANSC 2002.	1.2
ANSC 3002	Animal Reproduction 3	8	p ANSC 2002.	2
ANSC 3003	Animal Structure and Function 3A	8	p ANSC 2002.	1
And 24 credit points from the remaining Year 3 units of study:				
AGEC 2001	Commodity Price Analysis 2	8	p AGEC 1002 or(AGEC 1003 andAGEC 1004) orECON 1001.	1
AGEC 2003	Production Economics 2	8	p AGEC 1001 or AGEC 1031 orECON 2001 or (AGEC 1003 andAGEC 1004).	2
AGEC 3001	Agribusiness Management 3	8	p AGEC 2003 or (AGEC 1003 andAGEC 1004).	1,2
AGEC 4004	Applied Marketing	8	p AGEC 2001 or(AGEC 1003 &AGEC 1004) orECON 2001 orECON2901.	2
AGCH 3016	Agricultural Biotechnology 3	4	A AGCH 2002, GENE 2001, MICR 2101, ANSC 2002 and CROP 2001, or the equivalent of these units.	2
AGCH 3020	Chemistry & Biochemistry of Ecosystems A	4	P AGCH 2001 or AGCH 2002 or CHEM (2001 or 2101 or 2202 or 2301 or 2302 or 2902) or BCHM (2002 or 2902) or ENVI (2001 or 2002). N May not be counted with AGCH 3001 or 3004.	2
AGCH 3021	Chemistry & Biochemistry of Ecosystems B	4	C AGCH 3020. N May not be counted with AGCH 3001 or 3004.	2
AGCH 3017	Food Chemistry and Biochemistry A	4	P AGCH 2001 or AGCH 2002 or BCHM (2002 or 2902) or BMED (2501 and 2502 and 2504). N May not be counted with AGCH 3003 or 3005.	1
AGCH 3018	Food Chemistry and Biochemistry B	4	C AGCH 3017. N May not be counted with AGCH 3003 or 3005.	1
AGCH 3012	Rural Environmental Chemistry	4	P AGCH 2002 or ENVI 2001 and 2002. *NB: This unit is offered to students enrolled in BSc(Environmental), BLWSc and, subject to numbers, may be available to BScAgr. A maximum quota of 30 may exist. Contact Professor Kennedy.*	1
MICR 3102	Agricultural Microbiology 3	8	P MICR 2101.	2
ANSC 3004	Animal Structure and Function 3B	8	P ANSC 2002.	2
ANSC 3005	Animal Biotechnology 3	4	P Students are expected to have knowledge of Genetics equivalent at least to Agricultural Genetics 2 (GENE 2001) and knowledge of Animal Science equivalent to Animal Science 2 (ANSC 2002).	2
BIOM 3003	Statistical Modelling 3	4	P BIOM 2001 or BIOM 2002. N BIOM 3001.	1

Bachelor of Animal Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Semester
PPAT 3002	Plant Disease 3	4	P CROP 2001, CROP 2002, GENE 2001.	2
RSIS 3001	Rural Spatial Information Systems 3	4	P SOIL 2003, BIOM 2001 orBIOM 2002.	1
SOIL 3003	Soil Science 3	8	P SOIL 2003.	2
Year 4				
ANSC 4001	Animal Production 4A	24	p ANSC 3001, ANSC 3002, ANSC 3003.	1
ANSC 4002	Animal Production 4B	24	P ANSC 3001, ANSC 3002, ANSC 3003. c ANSC 4001.	2

3 Undergraduate units of study

- Bachelor of Agricultural Economics
- Bachelor of Animal Science
- Bachelor of Horticultural Science
- Bachelor of Land and Water Science
- Bachelor of Resource Economics
- Bachelor of Science in Agriculture

Accounting in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Discipline of Accounting and Business Law in the Faculty of Economics and Business offers the following level 3000 units. Refer to the Faculty of Economics and Business Handbook for unit descriptions.

- ACCT 3003 Financial Statement Analysis
- ACCT 3004 Auditing
- ACCT 3005 IT Assurance and Control
- ACCT 3006 ecommerce Business Models.

ACCT 1001 **Accounting IA**

6 credit points. Ms Gordon. Semester: 1, 2. Classes: (2 lectures, 1 tutorial & 1 practical)/week. Assumed knowledge: HSC Mathematics. Assessment: Final exam, test, assignments/group work.
Restricted entry (code 511500 or 521500 or 511503 or 521503 or Combined Commerce).
Introduces accounting and the double entry system of financial recording. Use is made of electronic computer spreadsheets to solve financial accounting problems. Examines assumptions underlying the preparation of financial statements for external users. Development of skills necessary to understand, discuss, analyse and write about accounting-related topics. Designed as an introduction to accounting. No prior knowledge of accounting assumed.

ACCT 1002 **Accounting IB**

6 credit points. Ms English. **Semester:** 1, 2, Summer. Classes: (2 lectures, 1 tutorial & 1 workshop)/week. Prerequisite: ACCT 1001. Assessment: One 1 hr mid semester test, one 2hr final exam, 1 computing test, 1 financial statement analysis assignment and weekly assignments.
Restricted entry (code 511500 or 521500 or 511503 or 521503 or Combined Commerce).
Accounting is about the use of information to make economic decisions. Accounting 1B (a) illustrates the problems in identifying and measuring economic information, (b) discusses solutions adopted by the accounting profession, and (c) develops students' ability to use the information to make decisions. It is obvious that accounting requires familiarity with technical rules and procedures. However, technical rules do not always provide clear guides; principles sometimes conflict. In these instances, it is necessary to use sound argument and judgement in devising a solution. The course material and assessment are designed to help students develop the necessary analytical, written and oral communication skills.

ACCT 1003 **Financial Accounting Concepts**

6 credit points. Ms Pickering. Semester: 1. Classes: 2 lectures/week. Prohibition: Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002. Assessment: One 3hr exam, mid-semester test.
Provides an introduction to the theory and practice of accounting. Designed primarily for students who are not majoring in accounting. The aim is to develop skills in preparing and analysing financial statements from a users' perspective. Topics include: the institutional arrangements in Australia and overseas, balance sheet equation, current assets (including inventory, accounts receivable), income measurement, financial statement preparation and analysis.

Note: Only available in the BEc, BEc(SocSc) and BAgrEc degrees and cannot be counted with Accounting IA and IB. If students have successfully completed Financial Accounting Concepts and Management Accounting Concepts and have gained a place in the Accounting quota code 500/503 by applying through UAC, they may be exempted from enrolling in Accounting IA and IB after having passed a cross-over examination. This examination will be available only to students who have gained a place in the code 500/503 quota.

ACCT 1004 Management Accounting Concepts

6 credit points. Dr. Frost. Semester: 2. Classes: (3 lectures - one 2hr lecture, one 1 hour lecture)/week. Prohibition: Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002. Assessment: One 2hr exam, a mid-semester test and 2 assignments.
This unit is designed to explain how accounting information is used by managers, 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.

Note: Only available in the BEc, BEc(SocSc) and BAgrEc degrees and cannot be counted with Accounting IA and IB. If students have successfully completed Financial Accounting Concepts and Management Accounting Concepts and have gained a place in the Accounting quota code 500/503 by applying through UAC, they may be exempted from enrolling in Accounting IA and IB after having passed a cross-over examination. This examination will be available only to students who have gained a place in the code 500/503 quota.

ACCT 2001 Financial Accounting A

8 credit points. Dr Natalie Gallery. Semester: 2, Summer. **Classes:** (2hr lecture, 1 hr lecture/workshop & 1 hr tutorial)/week. **Prerequisite:** ACCT 1001 and ACCT 1002. **Corequisite:** ECMT1010 and ECMT1020. Assessment: One project, 1.5 hr mid-semester test, 2hr final exam, weekly assignments.
This unit examines the accounting and reporting practices of reporting entities, particularly listed public companies. Emphasis is placed on developing an understanding of, and the ability to critically evaluate, the various regulatory requirements (professional and statutory) governing financial reporting. The unit commences with an overview of the financial reporting environment and theories that seek to explain the accounting policy choices of management. This framework provides a basis for examining a range of specific issues in financial accounting. Emphasis throughout the unit is on both the application of specific accounting techniques/rules and the conceptual/ theoretical issues associated with alternative accounting methods. Issues covered include accounting for intangible assets, leases, foreign currency, financial instruments, employee entitlements, extractive industries and superannuation funds.

ACCT 2002 Management Accounting A

8 credit points. Dr Frost. **Semester:** 1, Summer. **Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** ACCT 1001 and ACCT 1002. **Corequisite:** ECMT 1010 and ECMT 1020. Assessment: One 2hr exam, one test, assignments/groupwork.
This course provides students with an introduction to the basics of management/cost accounting. Areas specifically covered include: cost terms and purposes, cost behaviour, cost-volume-profit analysis, cost estimation via regression analysis and other means, basic and alternative product costing methods (including activity-based costing), detailed study of the mechanics of the budgeting process (master budgets, flexible budgets, standard costing and variance analysis), decision making using relevant costs/revenues and cost allocation.

ACCT 2003 Accounting and Business Info Systems

8 credit points. Mr. Edwards. Semester: 2. Classes: (2 lectures, 1 workshop/practical, 1 tutorial)/week. Prerequisite: ACCT 1002 or ACCT 1004. Assessment: Final examination, one test, assignments, groupwork.

This unit is designed to help students understand i) how accountants interact with the accounting systems of business and government as users, evaluators and designers, ii) how business processes impact on the appropriateness of the design of accounting systems. The unit is designed to provide you with a body of knowledge that includes: a broad awareness of the concepts of accounting and business processes - especially those pertaining to systems, information, managerial decision making, control, accounting models, and information technology; a familiarity with the basic business processes, such as inputs, outputs, processing procedures, the role of databases, and controls; a basic introduction to systems analysis and design techniques; and an understanding of the steps involved in comprehensive systems development, again with specific reference to the contribution that accountants - internal and external - can provide in modern computerised organisations. This unit incorporates practical work using a modern set of integrated accounting transaction processing and enterprise resource planning software.

ACCT 3001 Financial Accounting B

8 credit points. Dr Arthur. Semester: 1. Classes: (2 lectures, 1 tutorial & 1 workshop)/week. Prerequisite: ACCT 2001. Assessment: One 2hr exam, one 3hr exam, one case study, weekly assignments.

Advanced topics in financial accounting, including accounting for a company's investments in corporations, joint ventures and associates, and accounting methods used by public sector entities. Specific accounting issues in relation to group accounting include foreign currency translation, equity accounting, segment reporting and related party transactions. This course attempts to develop students' understanding of valuation issues in accounting and to critically evaluate the valuation methods used in the private and public sectors. Recent developments in measurement and valuation are examined.

ACCT 3002 Management Accounting B

8 credit points. Ms Buckmaster. Semester: 2. Classes: (2 lectures, 1 tutorial & 1 practical)/week. Prerequisite: ACCT 2002. Assessment: Final examination, one test, assignments and groupwork.

This unit provides students with an analysis of basic managerial problems focusing on the role of the management accountant in today's changing manufacturing and business environment. Concentrating on organisational and behavioural issues it contrasts with the rather technical approach of Management Accounting A. Topics include: decentralisation and transfer pricing and motivation; behavioural consequences (motivation, etc.) of budgeting and control systems; recent developments such as Just-In-Time inventory management, total quality management, activity based costing and capital budgeting.

AGCH 2002 Agricultural Chemistry 2

8 credit points. Dr Caldwell, Dr Lees. Semester: 1. Classes: 41 lec & 70 prac. Prerequisite: CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry. Assessment: One 3hr theory exam, one 3hr theory & prac exam, prac, assignments, quizzes.

This is an introductory unit of study consisting of aspects of chemistry and biochemistry relevant in studies of basic and applied biological sciences including agriculture and the environment. It introduces students to biophysical, biological and environmental chemistry. Lecture topics include: energy in the biosphere; the interaction of radiation and matter; solutions of neutral solutes and electrolytes; emulsions, foams and gels; the biological chemistry of carbohydrates, lipids, amino acids and proteins (including enzymes), nucleic acids; the metabolism of simple sugars, fatty acids and amino acids; the mechanisms of energy release and transduction, the basic pathway of carbon fixation in photosynthesis. Emphasis is given to the theory, principles and practice of the basic analytical techniques which underpin the more advanced instrumental methods used in many laboratory-based disciplines.

Practical: Laboratory classes cover introductory chemical and biochemical analysis. Instruction is given in the safe handling of chemicals and safe practices in chemical laboratories.

AGCH 3012 Rural Environmental Chemistry

4 credit points. Prof I R Kennedy. Semester: 1. Classes: 1 two hour tutorial and laboratory session per week. A 6-day field trip held in Orientation week. Prerequisite: AGCH 2002 or ENVI 2001 and 2002. Assessment: One 2hr exam, practical assessment (report) (50%).

This unit is offered to students enrolled in BSc(Environmental), BLWSc and, subject to numbers, may be available to BScAgr. A maximum quota of 30 may exist. Contact Professor Kennedy.

This unit of study is based on a field excursion to areas such as the Namoi Valley near Narrabri, and the Macquarie Marshes in the Macquarie Valley, where agriculture based on irrigation has been developed. The elementary aspects of soil formation and profiling will be examined and the extent of environmental impacts of these agricultural enterprises and human settlement assessed. Observations will be made in the field and samples of water, sediment and soil brought back for analysis at the University, covering tests such as pH, oxygen content, redox potential, salt content, nutrient content, water and solute transport and pesticide content. An interactive computer exercise will be used to foster knowledge gained from this excursion and its associated sample analyses.

AGCH 3016 Agricultural Biotechnology 3

4 credit points. Assoc. Prof. P J Sharp. Semester: 2. Classes: (2lec/wk, 6 tutorials, 5x4h practicals). Assumed knowledge: AGCH 2002, GENE 2001, MICR 2101, ANSC 2002 and CROP 2001, or the equivalent of these units. Assessment: Assignments (20%), 1 x 2hr exam (60%) Practical Book (20%).

The unit develops a basic understanding of the principles, practice and applications of biotechnology related to agricultural and environmental sciences. Students are introduced to the principles of molecular biology, recombinant technology, transformation of plants and animals, molecular diagnostics, bioinformatics and issues concerning bioethics. The theory of biotechnology is integrated into practical and tutorial sessions. Case studies will be drawn from the plant and animal sciences, bioremediation and gene therapy areas.

AGCH 3017 Food Chemistry and Biochemistry A

4 credit points. Dr Lees (Coordinator), Dr Caldwell, Prof. Copeland. Semester: 1. Classes: 3 lec & 1 tut/wk. Prerequisite: AGCH 2001 or AGCH 2002 or BCHM (2002 or 2902) or BMED (2501 and 2502 and 2504). Prohibition: May not be counted with AGCH 3003 or 3005. Assessment: One 2-hr exam (75%), assignments and quizzes (25%).

This unit of study aims to give students an understanding of the constituents of foods and fibres. The lecture topics cover:

- o the chemistry, biochemistry and processing behaviour of major food constituents - oligosaccharides, polysaccharides, lipids and proteins;
- o the relationship between molecular structure of constituents and their functionality in foods;
- o natural fibres and gel-forming biopolymers - uses in foods, importance in dietary fibre and commercial products;
- o enzymes in foods and food processing;
- o wheat flour doughs and protein chemistry during baking and cooking;
- o anti-nutritional and toxic constituents of plants and foods;
- o flavour chemistry.

AGCH 3018 Food Chemistry and Biochemistry B

4 credit points. Dr Lees (Coordinator), Dr Caldwell, Prof. Copeland. Semester: 1. Classes: 4 prac/wk. Corequisite: AGCH 3017. Prohibition: May not be counted with AGCH 3003 or 3005. Assessment: Laboratory reports and assignment.

This unit of study aims to give students an understanding of the methods used in the analysis of foods and other biological materials. The laboratory exercises will include:

- o Sample preparation;
- o Spectroscopic, enzymic, chromatographic (including GC and HPLC) and electrophoretic methods.

AGCH 3020 Chemistry & Biochemistry of Ecosystems A

4 credit points. Prof. Kennedy (Coordinator), Dr Caldwell, Dr Lees, Prof. Copeland. Semester: 2. Classes: 3 lec & 1 tut/wk. Prerequisite: AGCH 2001 or AGCH 2002 or CHEM (2001 or 2101 or 2202 or 2301 or 2302 or 2902) or BCHM (2002 or 2902) or ENVI (2001 or 2002). Prohibition: May not be counted with AGCH 3001 or 3004. Assessment: One 2-hr exam (60%), assignments and quizzes (40%).

This unit of study aims to give students an understanding of the chemical and biochemical processes in ecosystems. The lecture topics cover:

- o the biological carbon cycle - bioenergetics of autotrophy and heterotrophy, photosynthesis, fermenation, eutrophication;
- o the mineral nutrient cycles, uptake and utilization by organisms; pH balancing;
- o the biological nitrogen cycle - ammonification, nitrification of ammonia, denitrification of nitrate, nitrogen fixation, ammonia and nitrate assimilation;

o the biological sulphur cycle - sulphate assimilation, sulphate reduction and dissimilation in soil and water;

o the role of the nitrogen and sulphur cycles in the acidification of ecosystems; effects of acidification on plants and animals;

o pesticides and herbicides, modes of action, metabolism and detoxification; environmental chemistry and fate of pesticides; the design of new pesticides and means of pest control;

o heavy metals and plants, mechanisms of tolerance, hyperaccumulators, halophytes.

The tutorials are designed to provide students with an insight into environmental issues and methods for monitoring and remediation of contaminants including heavy metals and pesticides.

AGCH 3021 **Chemistry & Biochemistry of Ecosystems B**

4 credit points. Prof.Kennedy (Coordinator), Dr Caldwell, Dr Lees, Prof. Copeland. Semester: 2. Classes: 4 prac/wk. Corequisite: AGCH 3020. Prohibition: May not be counted with AGCH 3001 or 3004. Assessment: Laboratory reports and assignment.

This unit of study aims to give students an understanding of the practical skills required for chemical and biochemical methods of analysis used in environmental chemistry. The laboratory exercises will include:

o sample preparation;

o analyses of environmental samples for organic and inorganic nutrients, products and contaminants including heavy metals and pesticides;

o experience with gas, liquid and ion chromatography, atomic absorption spectroscopy, electrochemical methods, mass spectrometry and the use of immunoassays (ELISA).

AGCH 4002 **Agricultural Chemistry 4A**

24 credit points. Semester: 1. Classes: February. Prerequisite: AGCH 3004 or AGCH 3005 or AGCH 3020 and AGCH 3021 or AGCH 3017and AGCH 3018. Corequisite: AGCH 4003.

The unit of study aims to: provide students with problem-solving and commumcation skills required by professional scientists in enterprises concerned with agricultural production and processing, foods and beverages, and environmental science; enable students to learn to work independently in a laboratory environment; familiarise students with the research literature and methodology of biological chemistry, and provide a basis for students who wish to proceed to postgraduate work. The unit of study, together with AGCH 4003, will include 24 credit points Research Project and 24 credit points course work (including 6 credit points of Research Methods and Communication) in a total of 48 credit points.

AGCH 4003 **Agricultural Chemistry 4B**

24 credit points. Semester: 2. Corequisite: AGCH 4002.

See AGCH 4002 Agricultural Chemistry 4A.

AGCH 4004 **Cereal Science** 4A

24 credit points. Semester: 1. Classes: February. Prerequisite: AGCH 3005. Corequisite: AGCH 4005.

The unit of study aims to provide students with knowledge, and problem-solving and communication skills required by professional scientists in enterprises concerned with cereal production and processing, enable students to learn to work independently in a laboratory environment, familiarise students with the research literature and methodology of cereal science and provide a basis for students who wish to proceed to postgraduate research

The unit of study, together with AGCH 4005, will include 24 credit points Research Project on an aspect of Cereal Science and 24 credit points course work (including 6 credit points of Research Methods and Communication, and material directly related to the analysis of Cereal products) in a total of 48 credit points.

AGCH 4005 **Cereal Science 4B**

24 credit points. Semester: 2. Corequisite: AGCH 4004.

See AGCH 4004 Cereal Science 4A.

AGEC1001 **Agricultural Economics 1A**

6 credit points. Semester: 1. Classes: (3 lec & 1 tut)/wk. Assumed knowledge: HSC Mathematics. Assessment: One 2.5 hr exam, one essay, assignments.

An introductory unit of study serving as a foundation for other units in agricultural and resource economics. The basic structure and nature of the resource and agricultural industries are outlined. Basic economic principles as they relate to the management of production in these sectors are introduced and illustrated both graphically and mathematically. Topics will include: the changing structure of the Australian agricultural and resource sectors; their international context; problems of structural adjustment and technical change; government intervention; the economic, physical and biological environment in which farm firms operate; principles of resource allocation; basic farm accounts and budgets, and farm risk management. Students are expected to make use of computers in completing class work submitted for assessment.

Textbooks

L.R. (Bill) Malcolm, P.Sale and A.Egan Agriculture in Australia: An Introduction (Oxford U.P.), 1996

Reference Books

R.C. Buse and D.W. Bromley Applied Economics: Resource Allocation in Rural America (Iowa State U.P., 1975)

K.O. Campbell and B.S. Fisher Agricultural Marketing and Prices (Longman Cheshire, 1991)

F. Douglas (ed), Australian Agriculture: the complete reference on rural industry (Morescope, 1995)

C.A. Tisdell Microeconomics of Markets (Wiley 1982)

AGEC 1002 **Agricultural Economics 1B**

6 credit points. Semester: 2. Classes: (3 lec & 1 workshop)/wk. Assumed knowledge: HSC Mathematics. Corequisite: AGEC 1001. Assessment: One 2 hr theory exam, one 0.5 hr practical exam, one essay, assignments.

The unit focuses on the analytical formulation and numerical solution of empirical microeconomic problems in agriculture and the resource industries. Topics include: the measurement of the social value of alternative market equilibria; Marshallian surpluses and their limitations as measures of welfare; the rationale for and extent of government intervention in Australian and world agriculture. A wide range of problems in agriculture and resources is examined, with emphasis on formulating problems analytically and obtaining related numerical solutions. Computing workshops develop skills in using spreadsheets to solve numerical problems, and reporting results using a wordprocessor.

Textbooks

K O Campbell and B S Fisher Agricultural Marketing and Prices (Longman Cheshire, 1991)

Reference Books

R C Buse and D W Bromley Applied Economics: Resource Allocation in Rural America (Iowa State U P, 1975)

C A Tisdell Microeconomics of Markets (Wiley 1982)

AGEC 1003 **Economic Environment of Aust Agric 1A**

3 credit points. Semester: 1. Classes: (2 lec & 1 tut)/wk. Assumed knowledge: HSC Mathematics. Assessment: One 2 hr exam, assignments.

This unit of study is designed to give an understanding of some basic economic principles and to introduce the characteristics of the economic environment in which Australian agriculture operates. The topics discussed include: the structure, nature and history of the agricultural industries in Australia; agricultural adjustment in the world economy; introductory principles of production economics and farm management; elementary price theory and the factors affecting the demand, supply and prices of agricultural commodities.

Textbooks

K.O. Campbell and J.W. Bowyer (eds) The Scientific Basis of Modem Agriculture (Sydney U.P., 1988)

K.O. Campbell and B.S. Fisher Agricultural Marketing and Prices (Longman Cheshire, 1991)

F. Douglas (ed), Australian Agriculture: the complete reference on rural industry (Morescope, 1995)

L.R. Malcolm, P. Sale and A. Egan Agriculture in Australia: An Introduction (Oxford. U.P. 1996)

AGEC 1004 **Economic Environment of Aust Agric 1B**

3 credit points. Semester: 2. Classes: (2 lec & 1 tut)wk. Assumed knowledge: HSC Mathematics. Corequisite: AGEC 1003. Assessment: One 2 hr exam, one essay, assignments.

The focus is on the application of basic economic principles to some of the issues faced by agricultural industries in Australia. The topics discussed include: resource and environmental management; political and administrative institutions affecting Australian agriculture; means of achieving government objectives for the rural sector; structure of markets for agricultural commodities; marketing of agricultural products; the nature of international markets; problems in agricultural trade; worldwide supply and demand for foodstuffs in the future.

Textbooks

W. J. Baumol, A.S. Blinder, A.W. Gunther and J.R.L. Hicks, Economics. Principles and Policy (Harcourt, 1992)

K. 0. Campbell and B. S. Fisher Agricultural Marketing and Prices (Longman Cheshire, 1991)
F. Douglas (ed), Australian Agriculture: the complete reference on rural industry (Morescope, 1995)
L. R. Malcolm, P. Sale and A. Egan, Agriculture in Australia: An Introduction (Oxford U.P. 1996)

AGEC 1031 **Resource Economics 1**

6 credit points. Semester: 2. Classes: (3 lec & 1 workshop)/wk. Assumed knowledge: HSC 3 unit Mathematics or Mathematics Extension 1. Corequisite: ECON 1001. Assessment: One 2.5 hr exam, one 0.5 hr practical exam, classwork and assignments.

This unit provides an introduction to the economics of natural resources. Classification of natural resources. History of resource utilisation and industries in Australia. Current significance and issues of natural resources in the Australian and global economies. The role of the economist in analysing resource issues. Resource economics vs general economics. Simple analytics of natural resource economics. Resources considered will include land (eg, agriculture, forestry, minerals and energy, land degradation), water (eg, irrigation, urban, fishing) and the environment (eg, atmosphere, biodiversity, pollution). Includes 2 days of excursion.

Reference Books

G. Aplin Australians and their Environment (Oxford U.P., 1998)
W. J. Baumol, A.S. Blinder, A.W. Gunther and J.R.L. Hicks Economics. Principles and Policy 2nd Aust, edn (Harcourt, 1992).
R.C. Buse and D.W. Bromley Applied Economics: Resource Allocation in Rural America (Iowa State U.P., 1975)
Department of the Environment, Sport and Territories, State of the Environment Australia 1996 (CSIRO, 1996)

AGEC 2001 **Commodity Price Analysis 2**

8 credit points. Semester: 1. Classes: (3 lec & 1 tut)/wk. Prerequisite: AGEC 1002 or (AGEC 1003 and AGEC 1004) or ECON 1001. Assessment: One 3hr exam, classwork and assignments.

This unit is focussed on the analysis of prices, pricing mechanisms and the operations of markets for agricultural and resource commodities and products. Topics include technical vs fundamental analysis of prices; constructing price indexes; the theoretical foundation of consumer demand functions; theoretical relationships and empirical evidence concerning demand elasticities; aggregate supply relationships under perfectly and imperfectly competitive markets; equilibrium price determination in competitive markets; pricing by oligopolies and monopolies; structure, conduct and performance in industry; formulating structural models of commodity markets; reduced form models; partial and total elasticities; marketing services and marketing margin relationships; modelling expectations and other aspects of market dynamics; impact and dynamic multipliers; spatial markets and spatial pricing; product characteristics and hedonic price relationships. Applied examples from domestic and international agricultural and resource industries will be used.

Textbooks

W.G. Tomek and K.L. Robinson Agricultural Product Prices (Cornell University Press, 1990)

Reference Books

PC*. Helmberger and J.P. Chavas The Economics of Agricultural Prices (Prentice-Hall, 1996)
J. Hirschleifer and A. Glazer Price Theory and Applications (Prentice-Hall, 1992)
D.R. Kamerachen and L.M. Valentine Intermediate Microeconomic Theory^South-Western, 1977)
M. Wisniewski Introductory Mathematical Methods in Economics (McGraw-Hill, 1991)

AGEC 2003 **Production Economics 2**

8 credit points. **Semester:** 2. **Classes:** (3 lec & 2 workshop)/wk. **Prerequisite:** AGEC 1001 or AGEC 1031 or ECON 2001 or (AGEC 1003 and AGEC 1004). Assessment: One 1.5hr exam, one 1.5hr prac exam, assignments.

This unit has two components. The first focuses on the analysis of production based on neoclassical production functions. Topics include: graphical and mathematical representation of process level and aggregate production relationships; factor-product, factor-factor and product-product problems; optimal resource allocation in unconstrained and constrained situations; shadow prices of resources; factor demand and product supply equations, cost and profit functions; duality theory; economies of scale, size and scope; technical, allocative and economic efficiency and their assessment; time in production; modelling and measuring productivity and technical change. The second part focuses on linear activity analysis. Topics include basic input-output analysis and elements of linear programming. Graphical and mathematical representation of linear constrained optimization models; primal and dual solutions; post-optimality analysis; parametric programming.

Textbooks

D.L. Debertin Agricultural Production Economics (Macmillan, 1986)
S. M. Lee et al. Management Science (Wm C Brown, 1990)

Reference Books

B.R. Beattie and C R. Taylor The Economics of Production (Wiley, 1985)
B.R. Binger and E. Hoffman Microeconomics with Calculus (Scott, Foresman, 1988)
J. P. Doll and F. Orazem Production Economics: Theory with Applications (Wiley, 1984)
A. N. Rae Agricultural Management Economics. Activity Analysis and Decision Making (CAB International, 1994)

AGEC 2005 **Applied Commodity Modelling 2**

4 credit points. Semester: 1. Classes: (2 lec & 1 tut/lab session)/wk. Prerequisite: (ECMT1010 and ECMT1020) or (MATH 1001 and 1002 and 1003 and 1005). Prohibition: AGEC 2006 and AGEC 2007. Assessment: One 1 hr exam, one 1 hr prac exam, assignments.

The unit focuses on the concepts and basic procedures of regression analysis and the application of these methods to the analysis of economic data in the agricultural and resource sectors. Review of concepts of estimation and hypothesis testing. Simple regression model. Estimation and testing under classical assumptions. Multiple regression models and ordinary least squares estimation and testing under classical assumptions. Dummy variables. Lag variables. Deterministic model mis-specification. Single vs simultaneous equation models. Uses and limitations of graphical data analysis. Common departures from classical assumptions, their implications for estimation and improved methods of estimation. Students will learn the concepts and methods and develop skills in formulating and estimating models.

Textbooks

R.S. Pindyck and D.L. Rubinfeld Econometric Models and Economic Forecasts (McGraw-Hill, 1997)

Reference

K. White et al SHAZAM User's Reference Manual (McGraw-Hill, 1997)

AGEC 3001 **Agribusiness Management 3**

8 credit points. **Semester:** 1,2. Classes: (3 lec & 2 workshop)/wk. Prerequisite: AGEC 2003 or (AGEC 1003 and AGEC 1004). Assessment: One 3hr exam, assignments.

This unit of study is designed to introduce the economic principles and techniques of business management as they apply to farm and agribusiness firms. 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 rural credit market.

Practical: An integrated set of workshops is used to provide practical experience in firm planning utilising budgeting, gross margins analysis, linear programming, simulation methods and other techniques of analysis.

Textbooks

P.J. Barry et al. Financial Management in Agriculture (Interstate, 1995)
J.B. Hardakeret al. Coping with Risk in Agriculture (CAB, 1997)
J.P. Makeham et al. Best Bet Farm Decisions (U. of New England Press, 1968)
Q. Paris An Economic Interpretation of Linear Programming (Iowa State U.P., 1991)
A.N. Rae Agricultural Management Economics (CAB, 1994)
PA. Rickards and D.J. McConnell Budgeting, Gross Margins and Programming for Farm Planning (U. of New England Press, 1967)
R. Turvey Complan Handbook No 8: Enterprise Budgets for North West N.S.W. (N.S.W. Department of Agriculture, 1988)

AGEC 3002 **Agricultural and Resource Policy**

8 credit points. Semester: 2. Classes: (3 lec & 1 tut)/wk. Prerequisite: (AGEC 2001 & AGEC 2003) or ECON 2001 or ECON 2901. Assessment: One 2.5hrexam and assignments.

The topics discussed include: basic theoretical 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; microeconomic 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 for this course.

Textbooks

D. Godden Agricultural and Resource Policy: principles and practice (Oxford U.P., 1997)

AGEC 3004 Research Methods 3

4 credit points. **Semester: 2. Classes:** (3 lec & 1 lab)/wk for 6 weeks. **Prerequisite:** AGEC 2003 and AGEC 2002 or AGEC 2005 or (AGEC 2006 and AGEC 2007) or ECMT 2021. **Assessment:** One 1.5 hr exam, assignments.

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 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 illutsrated with examples of research in theoretical economics, empirical discipline-advancing research, empirical exploratory research, and research using policy-evaluation modelling.

Textbooks

J.A. Sharp and K. Howard The Management of a Student Research Project 2nd edn (Gower Publishing, 1996)

P. Phelan and P. Reynolds Argument and Evidence (Routledge, 1996)

Reference books

G.L. Johnson Research Methodology for Economists: Philosophy and Practice (Macmillan, 1986)

C.A.Moser and G.Kalton Survey Methods in Social Investigation 2nd edn (Heinemann, 1971)

AGEC 3031 Resource Economics 3

8 credit points. Semester: 1. Classes: (3 lec & 2hr workshops)/wk. Prerequisite: AGEC 2003. Assessment: One 3 hr exam, assignments.

This unit has two components. The first part deals with unpriced goods and services, how such goods and services arise as externalites, their implications for the efficiency of resource allocation, and methods of valuation to direct improved resource allocation. Examples will be drawn from environmental management. The second part of the unit deals with dynamic optimisation of natural resource use and covers the mathematical formulation of the problem of optimal use of renewable and finite non-renewable resources over time, the nature and economic interpretation of optimality conditions, and numerical methods for identifying optimal solutions. Example applications may include mining, forest rotations, waste absorptive capacity, recruitment and harvesting of natural populations.

Textbooks

Conrad, J.M. (1999), Resource Economics, CUP.

Garrod, G. and Willis, K.G. (2000), Economic Valuation of the Environment: methods and case studies, Edward Elgar, Cheltenham.

AGEC 3032 Introductory Land and Water Economics 3

4 credit points. **Semester:** 1. Classes: 4hr lec/wkshp/wk(8 wks). **Assessment:** Essay, classwork.

An overview is provided of the economic analysis of resource use, and its importance to the consideration of many environmental problems. L & W Economics studies is concerned with choices about resource use. Initial lectures sketch economic principles for analysing production and consumption, and applying these principles to water use and recreation. Property rights and time are focused on as key areas where basic economic principles require expansion in a resources context. These principles are then applied to benefit-cost analysis; economics of pollution; and optimising use of natural resources over time. These economic principles and tools are used too examine up to six natural resource problems, including: agricultural and urban water supply; blue-green algae; intractable waste; sustainable development; population and food supply; and the enhanced greenhouse effect. Workshops complement this theory.

Textbooks

A.Randall Resource Economics: An Economic Approach to Natural Resource and Environmental Policy 2nd edn (Wiley, 1987)

D.W.Pearce and R.K.Turner Economics of Natural Resources and the Environment (Johns Hopkins, 1990)

AGEC 4003 Applied international Trade

8 credit points. Semester: 1. Classes: (3 lec & 1 tut)/wk. Prerequisite: AGEC 2001 or (ECON 2001 and ECON 2002) or (ECON 2901 and ECON 2902). Assessment: One 3hrexam, assignments.

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; trade policies of importing and exporting nations, including issues such as food aid and surplus disposal programs; economic integration and impacts on international commodity trade; international trade policy making, including GATT and WTO; the impact of exchange rates and other macroeconomic variables on international trade in commodities.

Textbooks

J.P. Houck Elements of Agricultural Trade Policies (Macmillan, 1986)

D. Salvatore International Economics (Prentice Hall, 1994)

Reference book

N. Wallace and J. Evans (eds) International Commodity Markets: An Australian Perspective (Australian Bureau of Agricultural and Resource Economics, 1993)

AGEC 4004 Applied Marketing

8 credit points. Semester: 2. Classes: (3 lec & 1 tut/excursion)/wk. Prerequisite: AGEC 2001 or (AGEC 1003 & AGEC 1004) or ECON 2001 or ECON 2901. Assessment: One 3hr exam, assignments.

This unit of study will provide an understanding of the operation and principles of marketing, with practical applications focused on the food and fibre markets.

The main topics covered will include: firm-level marketing mix and marketing strategy decision making; marketing management and planning; market research and information; futures markets and other risk sharing devices. The unit of study will also address the organisation and trends of food and fibre marketing in Australia; food and fibre industrial marketing, including value-adding and power in the supply chain; market efficiency; and international marketing by agribusiness firms.

Textbooks

R.L Kohls and J.N. Uhl Marketing of Agricultural Products (Macmillan, 1990)

P. Kotler et al. Marketing: Australia and New Zealand (Prentice-Hall, 1994)

D.I.Padberg, C.Ritson and L.M.Albisu Agro-food Marketing [CAB International, 1997]

G.J.Seperich, M.W.Wolveiton and J.C.Beierlein Introduction to Agribusiness Marketing [Prentice-Hall, 1994]

AGEC 4005 Natural Resource Economics

8 credit points. Semester: 2. Classes: (3 lec & 1 tut)/wk. Prerequisite: (AGEC 2001 and AGEC 2003) or (ECON 2001 and ECON 2002). Assessment: One 3 hr exam, assignments.

A unit of study in natural resource economics of relevance to agriculture and the resource industries. Issues discussed are: the environment as a source of environmental services; socially efficient resource allocation and Pareto welfare economics; market failure and characteristics of environmental services; benefit cost analysis of public projects, including the modification of environmental services; non-depletable resources and pollution; depletable resources; irreversibility; sustainability. Applications include land degradation, fisheries, forestry, land-use planning and the enhanced greenhouse effect.

Textbooks

S. C.Hackett Environmental and Natural Resourec Economics (M.E. Sharpe, 1998)

N.Hanley, J.F. Shogren and B.White Environmental Economics in Theory and Practice (Macmillan, 1997)

D.W.Pearce and R.K.Turner Economics of Natural Resources and the Environment (John Hopkins, 1990)

AGEC 4007 Spec Topics Agricult/Resource Economics

8 credit points. **Semester:** 1,2. **Classes:** 1 tut/wk. **Assessment:** One 2hr exam, assignments/essays, term paper.

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.

AGEC 4008 Quantitative Planning Methods 4

4 credit points. **Semester:** 1. **Classes:** (3 lec & 1 tut/lab session)/wk for first 7 weeks of semester. **Prerequisite:** AGEC 2003. **Corequisite:** AGEC 3001 or AGEC 3031. **Assessment:** One 1.5 hr exam, assignments.

This unit examines the use of formal optimization methods at both the individual firm level and the sectoral level. Sectoral level planning applications considered include transportation and plant location studies; spatial equilibrium analyses; input-output analysis and computable general equilibrium analysis. Firm level applications include multi-period planning, queuing problems, inventory analysis, and replacement problems.

Textbooks

L.J. Moore et al. Management Science 4th edn (Allyn and Bacon, 1993)

Q. Paris An Economic Interpretation of Linear Programming (Iowa State U.P., 1991)
Reference books
P.B.R. Hazell and R.D. Norton Mathematical Programming for Economic Analysis in Agriculture (Macmillan, 1986)
W. Winston Operations Research Applications and Algorithms (PWS-Kent, 1991)

AGEC 4009 **Agricultural Finance & Risk Management 4**

4 credit points. Semester: 1. Classes: (4 lec & 1 tut/lab session)/wk for 6 weeks. Prerequisite: AGEC 2003. Corequisite: AGEC 3001 or AGEC 3031. Assessment: One 1.5 hr exam, assignments.
The first component of this unit is focused on concepts of risk measurement, risk attitudes and decision making under risk. Topics include: subjective probability, adjusting beliefs as a result of new information; alternative measures of risk; decision making under risk; expected utility theory; valuing information; stochastic dominance; E-V analysis; generalizations of expected utility theory; analysis of in-firm measures to cope with risk including diversification and flexibility; elements of quadratic programming; insurance, futures, options and other market instruments for managing risk. The second part examines issues of financial analysis and control. Topics include financial relationships between debt/equity levels and risk, optimal debt levels, cost of capital, investment, and capital budgeting. Financial and risk management practices in Australian agriculture are reviewed.
Textbooks
J.R. Anderson et al. Agricultural Decision Analysis (Iowa State U.P., 1977)
A.K. Dixit and R.S. Pindyck Investment under Uncertainty (Princeton U.P., 1994)
H. Levy and M. Sarnat Capital Investment and Financial Decisions (Prentice Hall, 1994)
Reference books
P.B.R. Hazell and R.D. Norton Mathematical Programming for Economic Analysis in Agriculture (Macmillan, 1986)
P.J. Barry, et al. Financial Management in Agriculture 5th edn (Interstate Press, 1993)

AGEC 4010 **Contemporary Issues 4A**

4 credit points. **Semester: 1. Classes:** 2 lec/wk. **Corequisite:** AGEC 4011 and at least 12 other level 4 AGEC credit points. **Assessment:** One 2 hr exam, assignments.
A series of lectures, seminars and workshops designed to provide students with enhanced professional skills and increased awareness of contemporary issues. Initially, sessions will focus on communication skills, including report writing, preparation of policy briefs, seminar and workshop presentations. Other sessions will be focussed 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. Seminars by guest speakers on current issues may be scheduled.

AGEC 4011 **Contemporary Issues 4B**

4 credit points. **Semester: 2. Classes:** 2 lec/wk. **Corequisite:** AGEC 4010 and at least 12 other level 4 AGEC credit points. **Assessment:** One 2 hr exam, assignments.
This unit continues the series commenced in Contemporary Issues 4A. Through regular seminars by guest speakers and occasional workshops or other participatory activities, students examine a broad range of domestic and international issues of current relevance to Australian agricultural and resource economists.

AGEC 4012 **Research Project 4A**

8 credit points. Semester: 1,2. Prerequisite: AGEC 3003 or AGEC 3004. Corequisite: AGEC 4013 and any other 24 credit points from AGEC Level 4000 units. Assessment: Thesis or project reports.
In this unit of study, students develop skills in economic research by designing, undertaking and reporting on either a single research study (thesis) or several smaller research exercises. For a thesis, students 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. Students undertaking research exercises typically work on individual and group exercises on three or four successive research topics, each under the guidance of a staff member, and each involving an individual or group report. Students are allocated to the thesis or the exercises form of research training on the basis of available Departmental resources and the advice and approval of the coordinator for the Research Project.

AGEC 4013 **Research Project 4B**

8 credit points. **Semester: 1,2. Prerequisite:** AGEC 3003 or AGEC 3004. **Corequisite:** AGEC 4012 and any other 24 credit points from AGEC Level 4000 units.
See AGEC 4012

AGEC 4020 **Agricultural Economics 4A**

24 credit points. Semester: 1. Prerequisite: AGEC 2001, AGEC 2003. Corequisite: AGEC 4021 Agricultural Economics 4B.
Agricultural Economics 4A and 4B represent a full year's study of agricultural economics. Through core and elective components (48 credit points minimum), students will study the economic theory and analysis of agricultural markets, trade and policy.

Unless taken as separate units of study in third year,

- (i) the following components must be included:
  Agricultural and Resource Policy 3 (8 credit points)
  Agricultural Finance and Risk Management (4 credit points)
  Applied Commodity Modelling 2 (4 credit points)
  Applied International Trade 4 (8 credit points)
  Research Project (8 credit points); and
- (ii) the following units may be included
  Agribusiness Management 3 (8 credit points)
  Applied Marketing 4 (8 credit points)
  Contemporary Issues 4A (4 credit points)
  Contemporary Issues 4B (4 credit points)
  Quantitative Planning Methods 4 (4 credit points)
  Up to 8 credit points as approved by the Head of Department.

Research Project will involve designing and undertaking a small economics research study under the supervision of a member of staff over two semesters. For contents of other components, see the description of that unit of study. Credit for components completed over the year will be allocated between Agricultural Economics 4A and 4B by the Head of Department.
Textbooks
D.I.Padberg, C.Ritson and L.M. Albisu Agro-food Marketing (CAB International, 1997)
G.J. Seperich, M.W. Wolverton and J.C. Beierlein Introduction to Agribusiness Marketing (Prentice-Hall, 1994)

AGEC 4021 **Agricultural Economics 4B**

24 credit points. **Semester: 2. Prerequisite:** AGEC 2001, AGEC 2003. **Corequisite:** AGEC 4020.
See AGEC 4020 Agricultural Economics 4A.

AGEC 4022 **Agribusiness 4A**

24 credit points. Semester: 1. Prerequisite: AGEC 3001, 24 credit points of 3rd year Agr Sc. Corequisite: AGEC 4023.
Agribusiness 4A and 4B represent a full year's study of the economic aspects of agribusiness. Through core and elective components (48 credit points minimum), students will study the operations and performance of individual firms, markets and government in the agricultural and related sectors.

Unless taken as separate units of study in third year,

- (i) the following components must be included:
  Agricultural and Resource Policy 3 (8 credit points)
  Commodity Price Analysis 2 (8 credit points)
  Research Project (4-8 credit points); and
- (ii) the following units may be included
  Agricultural Finance and Risk Management (4 credit points)
  Applied International Trade 4 (8 credit points)
  Applied Marketing 4 (8 credit points)
  Financial Accounting Concepts (6 credit points)
  Management Accounting Concepts (6 credit points)
  Quantitative Planning Methods 4 (4 credit points)
  Up to 8 credit points as approved by the Head of Department.

Research Project will involve designing and undertaking a small economics research study under the supervision of a member of staff over two semesters. For contents of other components, see the description of that unit of study. Credit for components completed over the year will be allocated between Agribusiness 4A and 4B by the Head of Department.

AGEC 4023 **Agribusiness 4B**

24 credit points. **Semester:** 2. **Prerequisite:** AGEC 3001, 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4022.
See AGEC 4022.

AGEC 4024 **Resource Economics 4A**

24 credit points. **Semester:** 1. **Prerequisite:** AGEC 2001, AGEC 2003 and 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4025.

Resource Economics 4A and 4B represent a full year's study of the economics of natural resources. Through core and elective components (48 credit points minimum), students will study the economic theory and analysis of markets, market imperfections, trade and government policy for the resources sector.

Unless taken as separate units of study in third year,

- (i) the following components must be included:
  Agricultural and Resource Policy 3 (8 credit points)
  Natural Resource Economics 4 (8 credit points)
  Research Project (8 credit points); and
- (ii) the following units may be included:
  Agribusiness Management 3 (8 credit points)
  Agricultural Finance and Risk Management (4 credit points)
  Applied Commodity Modelling 2 (8 credit points)
  Applied International Trade 4 (8 credit points)
  Applied Marketing 4 (8 credit points)
  Contemporary Issues 4A (4 credit points)
  Contemporary Issues 4B (4 credit points)
  Quantitative Planning Methods 4 (4 credit points)
  Up to 8 credit points as approved by the Head of Department.

Research Project will involve designing and undertaking a small economics research study under the supervision of a member of staff over two semesters. For contents of other components, see the description of that unit of study. Credit for components completed over the year will be allocated between Resource Economics 4A and 4B by the Head of Department.

AGEC 4025 **Resource Economics 4B**

24 credit points. **Semester: 2. Prerequisite:** AGEC 2001, AGEC 2003 and 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4024.
See AGEC 4024 Resource Economics 4A.

AGRF4000 **Professional Experience**

No credit points. **Semester: 1,2.**
Requirements for the 18 weeks outlined in 'Regulations".

AGRF 4001 **Special Program 4A**

24 credit points. **Semester:** 1.
Permission required for enrolment.
Students may enrol in Special Program after consultation with, and with the approval of, the Dean. This interdisciplinary unit of study structure is available for students who wish to undertake Fourth Year optional units of study combinations which are not offered by any individual department.

AGRF 4002 **Special Program 4B**

24 credit points. Semester: 2.
Permission required for enrolment.
See Special Program 4A.

AGRO 3001 **Agronomy 3**

8 credit points. Dr Sutton. Semester: 1. Classes: (3 lec, 3hr prao & 2hr seminar)/wk, [Excursion wk3: one day field practical]. Prerequisite: AGRO 2002 or CROP 1001 or HORT1001 or LWSC1001. Assessment: One 2hr exam(50%), assignment(40%), presentations^ 0%).
This unit of study introduces the principles and practice of the management of vegetation and water resources. The unit will describe the resource base, examine the tools available to manage the resources and address issues of sustainable utilisation of the resources. Crop, pasture and natural ecosystems will provide the focus for the lecture topics. The implications of government regulation of resource utilisation for primary industry and the environment will be discussed. Workshops will provide experience in resource auditing and in the construction and operation of environmental models and decision support systems to see how these techniques aid in resource management. A module of this course will examine the extension and communication of information to rural stakeholders. Practical sessions will allow students to develop skills in identification of pasture species, assessing pasture productivity and grazing Practical: Field Sessions will allow students to develop skills in identification of pasture species, assessing pasture productivity & grazing management
Reference books

V. Squires and P. Tow (eds) Dryland farraing-a systems approach—an analysis of dryland agriculture in Australia (Sydney University Press, 1991)
Brian Roberts The quest for sustainable agriculture and land use (U.N.S.W. Press, 1995) R Groves. Australian vegetation. (CSIRO 1987)
J Hardisty et al. Computerised environmental modelling. (John Wiley & Sons 1993)
C J. Pearson and R.L. Ison Agronomy of grassland systems. (Cambridge, 1997)
D.I. Smith. Water in Australia: resources and management. (Oxford University Press, 1998)

AGRO 4001 **Agronomy 4A**

24 credit points. Dr Campbell. Semester: 1. Prerequisite: AGRO 3001.
Agronomy is the science of growing plants-from creating on-farm opportunities to environmental protection and ecosystem management. Plant physiology and plant nutrition are addressed with formal lecture and practical session courses while crop agronomy, pasture agronomy and sustainability involve excursions and residential study periods in rural locations which allow the study of active field situations. Extensive opportunities are provided for field work and a personal research project is part of the program. This can be selected from a wide variety of topics; data may be gathered before or during the academic year.

Core units:

- Crop Agronomy & Sustainable Management (8 credit points)
- Crop Nutrition (6 credit points)
- Crop & Pasture Physiology (4 credit points)
- Pasture Agronomy (4 credit points)
- Special Studies (6 credit points)
- Research Project (12 or, with approval, 20 credit points)

plus units to total 48 credit points as approved by the Head of Department.

Crop Agronomy and Sustainable Management
8 credit points. Coordinator: Mr de Kantzow. Offered: March & July. Assessment: one 3hr exam, review paper.

A field-based course on management of crops with particular reference to (i) their ecology; (ii) their farming system-including technical and economic analysis of their management and their roles and restrictions within existing and potential farming systems; and (iii) their end uses, and how to better meet the technical needs of markets. Students use computer-based decision support systems to assist in simulating crop management. Analytical skills are developed by solving hypothetical problems in crop production.
Crop Nutrition
6 credit points. Coordinator: Dr Campbell. Offered: March & July. Assessment: one 2hr exam, assignments.

The course develops nutritional principles for agriculural production, food systems and for environmental protection. This course emphasises practical techniques. Practical sessions cover an integrated series of experiments on growth of a crop as affected by nutrition, the physiology of nutrient distribution during growth, diagnosis of nutrient deficiencies, C/N ratios, carbon fixation and hydroponics. Students set up and monitor their own nutrition experiment. Nutrient supply from compost and biosolids, mineral and heavy metal uptake and quality of nutrient inputs for plant growth are considered. Nutrient function and its relationship to plant growth, and consultancy problems are emphasised.

Excursions deal with waste management issues in the Sydney region, how useful agricultural products are produced, and utilisation of by-products.

Textbooks

R.W. Pearcy et al. (eds) Plant Physiological Ecology. Field Methods and Instrumentation (Chapman & Hall, 1989)
H. Marschner Mineral Nutrition of Higher Plants 2nd edn (Academic Press, 1995)

Crop and Pasture Physiology
4 credit points. Coordinator: Dr Jacobs. Offered: March. Assessment: one 2hr exam, assignments.

This course examines the physiology of crop and pasture plants. The course extends the concepts introduced in Crop Science 2. The impact of environment and management on photosynthesis, respiration, water relations, and plant development will be discussed in relation to the formation of grain or forage, and the quality of major crop and pasture species. The use of instrumentation to measure the physiological responses of plants to stress will be featured in practical sessions.
Pasture Agronomy

4 credit points. Coordinator: Dr Jacobs. Offered: March. Assessment: one 2hr exam, assignments, seminars.

This course explores the establishment, management and ecology of pastures and forage crops. The course extends the concepts introduced in Agronomy 3 and is based around field trips to different climatic and production regions of N.S.W, and New Zealand. Practical aspects of the role of pastures in Australian farming systems and their importance in the nutrition of grazing animals will be featured.

Special Studies
6 credit points. Coordinator: Mr de Kantzow. Offered: July. Assessment: one 2hr exam, assignments.

A combination of short courses in which the topics include Land Management (a series of visits to Government agencies which manage natural resources - eg, the EPA, Department of Lands and Water Conservation, National Parks and Wildlife), Pesticide Management (eg, Avcare certification as a voluntary option) and product utilization and processing (flour milling, starch manufacture).

*Research Project **and** Thesis*
12 or, with approval, 20 credit points.

Supervised research on a topic chosen by the student in the area of cropping systems, cereals production, plant nutrition, food systems or pasture and weed ecology.

AGRO 4002 **Agronomy 4B**

24 credit points. **Semester: 2. Prerequisite:** AQRO 3001. **Corequisite:** AGRO4001.

See AGRO 4001 Agronomy 4A.

ANSC 2002 **Animal Science 2**

6 credit points. Dr M Hyde, Assoc. Prof. Maxwell, Dr R. Taylor, Assoc. Prof. P Wynn, Dr D. Evans, Dr M Collier, Dr D McNeill. **Semester: 2. Classes:** lectures, tutorials, seminars and prac classes. **Prerequisite:** CROP 1001 and CROP 1002 or HORT1001 and HORT 1002orLWSC 1001 and LWSC 1002. **Corequisite:** AGCH 2002. **Assessment:** One exam(35%), assignments.

The unit of study is an integrated one designed to cater for students terminating studies in animal sciences at the end of Second Year and to provide the basis for students intending to specialise in animal production in later years. The lectures will be as outlined below:

Animal Industries: A series of lectures which describes the characteristics of the animal production industries. Lectures will be reinforced by practical classes to be held at Camden.

Animal Structure and Function: A series of lectures, tutorials and practical classes which describes the structure and function of agricultural animals.

Textbooks
W.O. Reece Physiology of Domestic Animals (Lea and Febiger, 1991)
P. McDonald et al. Animal Nutrition 4th edn (Longman Scientific & Technical, 1988)

ANSC 2003 **Animal Science 2 for Agr Economics**

4 credit points. Dr Hyde, Assoc. Prof. Maxwell,, Camden staff. **Semester: 2. Classes:** 7 full day sessions integrating practical and theoretical aspects of animal production. **Assessment:** One exam, one assignment, a series of practical tasks.

A series of lectures which describes characteristics of the animal production industries-locations, breeds of animals, management practices, products, marketing. Lectures and practical classes form a portion of the unit of study Animal Science 2 undertaken in the BScAgr degree.

ANSC 3001 **Animal Nutrition 3**

8 credit points. Dr Hyde, Prof. D. Fraser. **Semester: 1**,2. **Classes:** 12hr tut, 12 pracs, 2 excursions, 18hr project. **Prerequisite:** ANSC 2002. **Assessment:** One 2hr exam(40%), two assignments (30%), project (25%), self-assessment (5%).

This unit comprises an integrated series of lectures, tutorials and practical classes which are directed towards the assessment of nutritional adequacy and the avoidance and solving of nutritional problems. Topics covered include the composition of feeds, the digestibility and efficiency of utilisation of nutrients by the animal, the requirement of the animal for nutrients and interactions between nutrients that influence health and production.

Textbooks
P. McDonald et al. Animal Nutrition 5th edn (Longman Scientific and Technical, 1995)
Others to be advised

ANSC 3002 **Animal Reproduction 3**

8 credit points. Assoc. Prof. Evans, Assoc.Prof. Maxwell. **Semester:** 2. **Classes:** (3 lec)/wk; 52hr prac, 13hrtut. **Prerequisite:** ANSC 2002. **Assessment:** One 3hr written exam (60%), prac (20%) assignments (20%).

A comprehensive program on basic and applied male and female reproductive biology with particular emphasis on domestic animals. The unit of study includes reproductive cycles, sexual differentiation, fertilisation, development, gestation and parturition. Applied aspects include tuition on semen collection and processing, control and management of reproduction, artificial insemination, embryo transfer, pregnancy diagnosis, and induction of parturition. Tuition is given on campus in Sydney and at the University Farms, Camden and includes lectures, tutorial and practical classes.

ANSC 3003 **Animal Structure and Function 3A**

8 credit points. Dr Taylor, Dr Hemsley, Dr Collier. **Semester: 1. Classes:** 100hr integrated prac/tut. **Prerequisite:** ANSC 2002. **Assessment:** One 2hrexam(30%), tests (30%), 2 assignments (20% each).

This unit of study provides an integrated study of the structure and function of animals, with a detailed coverage of topics of particular importance to agricultual scientists, such as reproduction, digestion, thermoregulation and cardiorespiratory function.

Textbooks
K.M. Dyce, W.O. Sack and C.J.G. Wensing Textbook of Veterinary Anatomy (W.B. Saunders, Philadelphia,1987)
W.B. Currie (1995) Structure and Function of Domestic Animals, CRC
or C.Starr and R.Taggart (2001) Animal Structure and Function, Brooks/Cole
Handbook-a course handbook will be available for purchase. It contains details of assessment, lecture outlines, objectives, reference lists, details of practical classes, staffing, questions and diagrams

ANSC 3004 **Animal Structure and Function 3B**

8 credit points. Dr Taylor, Assoc.Prof. D. Evans, Dr McGreevy, Dr Collier, Prof. D Fraser. **Semester:** 2. **Classes:** 100hr integrated teaching: dissections, projects, tutorials, excursions and computer based learning. **Prerequisite:** ANSC 2002. **Assessment:** One 2hr exam(30%), tests [30%],prac exam (20%), assignment (20%).

This unit of study provides an integrated study of the structure and function of livestock animals, covering topics which were not covered in ASF 3 A. It will build on the concepts which were introduced and skills acquired in the ASF 3A unit of study and extend students' knowledge of the structure and function of the urinary tract, nerve, muscle, bone and skin, animal behaviour, animal welfare, avian structure and function, aquaculture and deer production. The concepts developed will be applied to analysis and resolution of problems in animal production.

Textbooks
Same as ANSC 3003Animal Structure and Function 3A
Plus: J.E. Smallwood An Introductory Study of Bovine Anatomy, Smallwood(1973)
Handbook-a course handbook will be available for purchase. It contains details of assessment, lecture outlines, objectives, reference lists, details of practical classes, staffing, questions and diagrams

ANSC 3005 **Animal Biotechnology 3**

4 credit points. A/Prof C Moran. **Semester: 2. Classes:** (1hr lect, 1 hr tut, 2 hrs of supervised reading, seminars, excursions, computer aided instruction)/wk. **Prerequisite:** Students are expected to have knowledge of Genetics equivalent at least to Agricultural Genetics 2 (GENE 2001) and knowledge of Animal Science equivalent to Animal Science 2 (ANSC 2002). **Assessment:** One 2 hour exam (60%), assignments (20%), seminar (20%).

Lectures, tutorials and supervised reading and computer aided instruction cover the application of biotechnology to animal productivity, disease control, the development of new products from domestic animals and the impact of mircoorganism and plant biotechnology on animals. Included are aspects of molecular genetics, cell biology and recombinant DNA technology not included in Agricultural Biotechnology and specifically relevant to animals; regulation and monitoring of gene expression; the techniques and outcomes of genetic mapping and genomics in gene discovery, techniques and outcomes of transgenesis, including nuclear transfer, knockout mutagenesis and production of human and animal pharmaceutical proteins; gene transfer for modulating tissue function and repair of inherited and acquired defects; production and use of recombinant proteins, bioinformafics, including techniques for storing, retrieving and analysing molecular and genomic information; intellectual property protection, risks and benefits; ethical implications of biotechnology.

ANSC 4001 **Animal Production 4A**

24 credit points. Assoc. Prof. Wynn. **Semester:** 1. Prerequisite: ANSC 3001, ANSC 3002, ANSC 3003.

Location: Werombi Road, Camden.

The year is devoted to advanced Animal Production and a certain degree of specialisation by medium of project work is compulsory. Students are in residence at the University Farms, Camden, for a whole year, where advanced lecture and practical courses are taken in the following subjects: poultry, genetics, and dairying. About 30 per cent of the time available is spent on project work, for which students undertake projects in the various sections of the Discipline of Animal Science at Camden or Sydney or other agricultural institutes outside the University.

Reference books

Agricultural Research Council The Nutrient Requirements of Farm Livestock
-No. 1: Poultry 2nd edn (1975)
-No. 2: Ruminants (1980)
-No. 3: Pigs (1981)
G. Alexander and O.B. Williams The Pastoral Industries of Australia (Sydney U.P., 1979)
P.B. English et al. The Sow, Improving her Efficiency (Farming Press. 1977)
D.C. Falconer Introduction to Quantitative Genetics 2nd edn (Longman, 1981)
C.W. Holmes and G.F. Wilson Milk Production from Pastures (Butterworths, 1984)
D.R. Lindsay and D.I. Pearce Reproduction in Sheep (Australian Academy of Sciences, 1984)
T.R. Preston and R.A. Leng Matching Ruminant Production Systems with Available Resources in the Tropics and Sub-Tropics (Penambul Books, Armidale, 1987)
I.M. Roitt Essential Immunology 8th edn (Blackwell, 1994)
D. Sainsbury Poultry Health and Management 3rd edn (Blackwell, 1992)
FW Nicholas Introduction to Veterinary Genetics (Oxford, 1996)
D.J. Cottle Australian Sheep and Wool Handbook (Inkata Press, 1991)
R.A. Lawrie Developments in Meat Science No.s 1-2 (Applied Science Publishers, 1980,1981)
R.A. Lawrie Developments in Meat Science No.s 3-5 (Elsevier Applied Science, 1985,1988,1991)
A.T. Chamberlain and J.M. Wilkinson Feeding the Dairy Cows (Chalcombe Publishers, 1996)
T.B. Mepham Physiology of Lactation (Open University Press, 1987)
C. Whittemore The Science and Practice of Pig Production (Longman, 1993)
J. Hickman Horse Management (2nd edn) (Academic Press, 1987)
Other textbooks to be advised

ANSC 4002 **Animal Production 4B**

24 credit points. Semester: 2. Prerequisite: ANSC 3001, ANSC 3002, ANSC 3003. Corequisite: ANSC 4001.

The following subject areas are covered: meat technology, pig and horse production and animal health, wool production and control of animal diseases. Students will complete their research project.

Textbooks

See Animal Production 4A

■ Asian Studies units in the Bachelor of Agricultural Economics

ASNS 2601 **Asian Studies 1A**

4 credit points. MsYasumoto. Semester: 1.

Students attend classes for JPNS 1111. See unit description.

ASNS 2602 **Asian Studies 1B**

4 credit points. MsYasumoto. Semester: 2. Prerequisite: ASNS 2601.

Students attend classes for either JPNS 1012 or JPNS 1112. See relevant course descriptions.

ASNS 2603 **Asian Studies 2A**

4 credit points. Ms Yasumoto. Semester: 1. Prerequisite: ASNS 2602.

Students attend classes for either JPNS 2011 or JPNS 2111. See relevant course descriptions.

ASNS 2604 Asian Studies 2B

4 credit points. MsYasumoto. Semester: 2. Prerequisite: ASNS 2603.

Students attend classes for either JPNS 2012 or JPNS 2112. See relevant course descriptions.

ASNS 3601 Asian Studies 3A (Japanese)

4 credit points. Ms Yasumoto. Semester: 1. Prerequisite: ASNS 2604.

Students attend classes for either JPNS 2201 (see relevant course description) or one Japanese Studies elective unit of study (consult School of Asian Studies).

ASNS 3602 **Asian Studies 3B (Japanese)**

4 credit points. MsYasumoto. Semester: 2. Prerequisite: ASNS 3601.

Students attend classes for either JPNS 2202 (see relevant course description) or one Japanese Studies elective unit of study (consult School of Asian Studies).

BIOL 1001 **Concepts in Biology**

6 credit points. Semester: 1, Summer. Classes: 3 lec & 3 prac/wk. Assumed knowledge: HSC Biology. Prohibition: May not be counted with BIOL 1901 or 1500. Assessment: One 2.5hr exam, assignments, classwork.

'Concepts in Biology' is an introduction to the major themes of modern biology. Starting with interactions between organisms in biological communities, we move on to the diversity of microorganisms. This is followed by introductory cell biology, which particularly emphasises how cells obtain and use energy, and leads into an introduction to molecular biology through the role of DNA in protein synthesis and development. The genetics of organisms is then discussed, leading to consideration of theories of evolution and the origins of the diversity of modern organisms. It is recommended that this unit of study be taken before all other Junior units of study in Biology.

Textbooks

Knox R B et al. Biology. McGraw-Hill, 2nd ed, 2001.

BIOL 1201 **Biology - Agricultural Concepts**

4 credit points. Semester: 1. Classes: (3 lec & 3 prac)/wk. Assumed knowledge: HSC 2 unit Biology. Assessment: One 1,5hr exam, practical test, assignments, classwork.

'Agricultural Concepts' is an introduction to the major themes of modern biology. Starting with interactions between organisms in biological communities, we move on to the diversity of microorganisms. This is followed by introductory cell biology, which particularly emphasises how cells obtain and use energy, and leads into an introduction to molecular biology through the role of DNA in protein synthesis and development.

For further information, consult 'Information for Students in First Year Biology' booklet available from the Faculty of Agriculture office during the Orientation period.

Textbooks

R.B. Knox et al. Biology (McGraw-Hill, 1995)

BIOL 1202 **Biology - Agricultural Systems**

5 credit points. Semester: 2. Classes: (3 lec & 3 prac)/wk. Assumed knowledge: BIOL 1201 or HSC 2 unitBiology. Assessment: One 1.5hr exam, practical test, assignments, classwork.

'Agricultural Systems' deals with the biology of all sorts 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 course 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.

For further information, consult 'Information for Students in First Year Biology' booklet available from the Faculty of Agriculture office during the Orientation period.

Textbooks

R.B. Knox et al. Biology (McGraw-Hill, 1995)

BIOL 2001 **Animals A**

8 credit points. Assoc. Prof. M B Thompson, Dr E L May. Semester: 1. Classes: 3 lec, 1 tut & 1 prac/wk or 4 lec & 1 prac/wk. Prerequisite: 12 credit points of Junior Chemistry (for students in the BSc (Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). Qualifying: BIOL (1001 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). Prohibition: May not be counted with BIOL 2101 or 2901. Assessment: One 1 hr & one 2hr theory exams, one 2hr prac exam, 1 essay, tutorial work.

The completion ofMBLG 2001 or 2101 or 2901 is highly recommended. The content of BIOL 1002/1902 is assumed knowledge and students entering from BIOL 1003 or 1903 will need to do some preparatory reading. Students taking this unit concurrently with (or following completion of) BIOL 2004 or 2904 or 2006 or 2906 must complete 32 hours of alternative work in one unit

This unit of study provides a thorough grounding in the diversity of animals by lectures and detailed laboratory classes, which include dissections and demonstrations of the functional anatomy of invertebrates. The material is presented within the conceptual framework of evolution and the principles and use of phylogeny and classification. Tutorials further explore concepts of evolution, phylogeny and biodiversity and provide opportunity to develop communication skills. The unit of study is designed to be taken in conjunction with BIOL 2002 Animals B; the two units of study together provide complete coverage of the diversity of animals at the level of phylum. This unit of study may be taken alone, but when taken with Biology 2002 Animals B provides entry into certain Senior Biology units of study.

BIOL 2004 **Plant Ecology and Diversity**

8 credit points. Dr McGee, Dr Henwood, Dr Marc, Dr Quinnell, Dr Wardle. Semester: 1. Classes: 2 lec, 1 prac/audiovisual & 1 tut/wk. Qualifying: BIOL (1001 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and

Health Education)). Corequisite: MICR 2013 for BLWSc. Prohibition: May not be counted with BIOL 2904. Assessment: One theory exam, 1 prac exam, one 1000w essay, classwork.
The completion of MBLG 2001 or 2101 or 2901 is highly recommended. The content of Biology 1002/1902 is assumed knowledge and students entering from BIOL 1003 or 1903 will need to do some preparatory reading. Students taking this unit concurrently with (or following completion of) BIOL 2001 or 2901 or 2006 or 2906 must complete 32 hours of alternative work in one unit, in place of the core material common to both units and if taking the units concurrently, must elect at enrolment in which unit they wish to do the alternative work.
The unit of study provides an integrated overview of plant ecology and plant diversity. It examines how plants live in their natural environment, how their functions are affected by environmental changes and by other plants, and how the environment affects plant distribution. The rich diversity of plants living in the sea, freshwater, and on the land is explored in relation to major evolutionary advances in their form and function. Practical aspects are covered in laboratory classes, audiovisual sessions, and a field trip. Each student is required to make a plant collection. This unit of study complements BIOL 2003 and leads up to plant modules in Senior Biology.

■ Biology units in the Bachelor of Agricultural Economics

Units offered by the School of Biological Sciences in the Faculty of Science. Refer to the Faculty of Science Handbook for unit descriptions.

- BIOL 1001 Concepts in Biology
- BIOL 1002 Living Systems
- BIOL 1003 Human Biology.

BIOM 1001 Biometry 1

5 credit points. Assoc. Prof. M. O'Neill. **Semester: 1. Classes:** (2 lec, 2 prac &1 tut)/wk. **Assumed knowledge:** HSC Mathematics. **Assessment:** One 2hr practical and one 2hr theory exam (open book), class work.
This unit of study provides students with basic computing and quantitative skills for their subsequent Agricultural Science degree. It examines some useful mathematical techniques such as least squares, differentiation and integration as applied to growth curves and simple modelling, especially via the use of computers, basic statistical topics covered inclide: describing biological date and variability, sampling and estimation, framing biological hypotheses; estimating and testing a single treatment mean via a z-test or t-test.

Practical classes will involve extensive use of personal computers. There will be a general introduction to computers, file management and software as related to agriculture. The spreadsheet package Excel and the statistical packages Minitab and Genstat will be used for mathematical analysis and for graphics presentation. Students will also be introduced to Word for work processing, and the transfer of text and graphics across Windows applications will be demonstrated.

BIOM 1002 Environmetrics 1

6 credit points. Dr P Thomson. **Semester:** 2. **Classes:** (3 lec, 1 tut & 2 lab)wk. **Assumed knowledge:** HSC Mathematics. **Assessment:** Assignments (15%), Quizzes (10%), Practical Test (25%). one 3hr exam (50%). All open book.
This unit of study provides an introduction to computing, mathematical, and statistical techniques that are commonly used in biological and environmental sciences. After a brief introduction to computing in a Windows environment, considerable time is spent on the efficient use of spreadsheet programs for modelling of biological, environmental, and agricultural problems. Along the way, some basic mathematical techniques (function evaluation, differentiation and integration) will be introduced with an emphasis on their application to quantitative biological and environmental problems. Issues of biological variability will be considered, and some common descriptive statistical procedures will be described. The normal distribution, the cornerstone for modelling biological and environmental variability will be described, along with an introduction to scientific hypothesis testing.

BIOM 2001 Biometry 2

6 credit points. Assoc. Prof. M O'Neill. **Semester: 2. Classes:** (3 lec, 2 prac & 1 tut)/wk. **Prerequisite: BIOM 1**001 or **BIOM 1**002. **Assessment:** One 2hr practical exam, one 3hr theory exam (open book), class work.
This unit of study extends the techniques considered in Biometry 1, and considers problems of statistical design and analysis encountered in research in the biological, agricultural and veterinary sciences. In practical classes the computer packages Minitab, Genstat and Excel are used extensively to analyse and summarise experimental data.

The first part of the unit of study covers: a review of biological variability in statistical terms; extending the theory of sampling, estimation and hypothesis testing to two or more treatment means via an F-test. The second part considers practical experimental design: randomisation and replication; the concept of experimental units; controlling variability in experimental material by pairing and blocking; applications of the analysis of variance; completely random and randomised complete block designs; Latin square designs; factorial treatment designs; missing data problems. The third component covers: linear relationships (regression, correlation) between two biological measurements; multiple linear regression model relating a biological variable to a number of predictor variables; analysis of covariance; analysis of contingency tables.
Reference book
R. Mead, R.N. Curnow and A.M. Hasted Statistical Methods in Agriculture and Experimental Biology 2nd edn (Chapman & Hall, 1993)

BIOM 2002 **Environmetrics 2**

4 credit points. Assoc Prof M O'Neill, Dr P Thomson. **Semester:** 2. **Classes:** (2 lec 1tut &1 lab)wk. **Prerequisite:** BIOM 1002 or BIOM 1001. **Assessment:** Assignments (15%), Quizzes (10%), Practical Test (25%). one 2hrexam (50%). All open book.
This unit of study primarily develops the statistical analysis tools that were introduced in Environmetrics 1. After a brief revision of basic statistical concepts, these ideas will be extended for the comparison of two samples and multiple samples (ANOVA). The principles of experimental design will be considered (randomisation, replication), followed by some specific types of design and their analysis (completely randomised design, blocked designs). However, much environmental research involves observational studies where true replication is not feasible, and some specific forms of 'design' and analysis will be considered. A range of environmental sampling types will be explored (eg, simple and stratified sampling, sampling to locate pollutant 'hot-spots'. We will then briefly look at several specific issues, including techniques for detecting trends in environmental quality. We conclude with some discussion of fitting linear models to data (regression analysis) and strategies for model fitting.

BIOM 3002 Experimental Design 3

4 credit points. Assoc. Prof. M. O'Neill. Semester: 1. Classes: (2 lec, & 3 prac)/wk. Prerequisite: BIOM 2001 or BIOM 2002. Prohibition: BIOM 3001. Assessment: One 2hrexam (50%), assignments (15%), computer practicals (10%), practical test (25%). All open book.
This unit is designed for students who are interested in majoring in Biometry, or for students from other disciplines with an interest in further development of their skills in experimental design and analysis. It builds on the topics introduced in Biometry 2, and aims to give students sufficient skills and confidence to complete the analysis of their own research data in Fourth Years with a high degree of competence.

After some revision of standard statistical techniques, the unit synthesises work on regression analysis and analysis of variance into the general linear model. This leads to the analysis of treatment designs which are structured: complete and incomplete factorial designs, and designs intended to model treatment response or to compare groups of treatments. Some special techniques and designs will be considered, such as repeated measures designs for the analysis of data collected from repeated observations on the same experimental unit.

BIOM 3003 Statistical Modelling 3

4 credit points. Dr P. Thomson. Semester: 1. Classes: (2 lec, 3 pract)/wk. Prerequisite: BIOM 2001 or BIOM 2002. Prohibition: BIOM 3001. Assessment: One 2hr exam (50%), assignments (15%), computer practicals (10%), practical test (25%). All open book.
This unit is designed for students who are interested in majoring in Biometry, or for students from other disciplines with an interest in further development of their skills in advanced statistical modelling techniques, especially in analysis of observational data. We also consider various techniques for the analysis of non-normal data, such as dealing with counts and proportions. It builds on the topics introduced in Biometry 2, and aims to give students sufficient skills and confidence to complete

the analysis of their own research data in Fourth Years with a high degree of competence.

After some revision of standard statistical techniques, we first consider the fitting of nonlinear models, such as used in modelling biological growth. Next we consider various forms of generalised linear models for analysing non-normal data, specifically logistic regression for analysing binary and proportion data, as well as Poisson regression (loglinear modelling) for analysing count data. Other special forms of analysis are considered such as time series analysis.

BIOM 4001 **Biometry 4A**

24 credit points. Assoc. Prof. M. O'Neill, Dr. P. Thomson. **Semester:** 1. **Prerequisite:** BIOM 3001 or BIOM 3002 and BIOM 3003.

This unit of study trains people for careers as biometricians or statisticians. Much of the applied work encountered in Biometry 1,2, and 3 is synthesised into a more formal statistical framework. The unit will also cover some more modern techniques in use by biometricians, and provide some mathematical training necessary to pursue theoretical studies in biometry. Some of the Fourth Year units may be undertaken in the School of Mathematics and Statistics, and supplemented with extra work in Biometry.

Core units:

- Matrix Algebra and Linear Models (6 credit points)
- Biomedical Methods A (6 credit points)

plus 12 credit points chosen from:

- Research Project A (6 or 12 credit points)
- Mathematical Statistics A (6 credit points)
- or from other units of study approved by the Head of Department.

BIOM 4002 **Biometry 4B**

24 credit points. Assoc. Prof. M. O'Neill, Dr. P.Thomson. Semester: 2. Corequisite: BIOM 4001.

As in the unit of study Biometry 4A, this unit provides further specialised skills in Biometry and Statistics. Some coursework may be undertaken in the School of Mathematics, as well as in Biometry. A Research project of at least 6 credit points is to be undertaken.

Core units:

- Research project B (6 or 12 credit points)
- Biometrical Methods B (6 credit points)

plus 6 or 12 credit points chosen from

- Mathematical Statistics B (6 credit points)
- or from units of study approved by the Head of Department

CHEM 1001 Fundamentals of Chemistry 1A

6 credit points. Semester: 1. Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 9 wks. 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. Prohibition: May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909. Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

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.

Practical: A series of 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1002 Fundamentals of Chemistry 1B

6 credit points. Semester: 2. Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 9 wks. Prerequisite: CHEM 1001 or 1101 or equivalent. Prohibition: May not be counted with CHEM 1102 or 1902 or 1904 or 1907 or 1908. Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 1002 builds on Chemistry 1001 to provide a sound coverage of inorganic and organic chemistry.

Lectures: A series of 39 lectures, three per week throughout the semester.

Practical: A series of 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1101 Chemistry 1A

6 credit points. Semester: 1,2. Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 9 wks. Assumed knowledge: HSC Chemistry and Mathematics. Corequisite: Recommended concurrent units of study: 6 credit points of Junior Mathematics. Prohibition: May not be counted with CHEM 1001 or 1901 or 1903 or 1905 or 1906 or 1909. Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 1A is built on a satisfactory prior knowledge of the HSC 2-unit 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.

Practical: A series of 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1102 Chemistry 1B

6 credit points. Semester: 1, 2. Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 9 wks. Qualifying: CHEM 1101 or a Distinction in CHEM 1001 or equivalent. Corequisite: Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH 1003 or 1903. Prohibition: May not be counted with CHEM 1002 or 1902 or 1904 or 1907 or 1908. Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 1B is built on a satisfactory prior knowledge of Chemistry 1A and covers inorganic and organic chemistry. 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.

Practical: A series of 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1901 Chemistry 1A (Advanced)

6 credit points. Semester: 1. Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 9 wks. Prerequisite: UAI of at least 93 and HSC Chemistry result in the 80th percentile or better, or Distinction or better in a University level Chemistry unit, or by invitation. Corequisite: Recommended concurrent unit of study: 6 credit points of Junior Mathematics. Prohibition: May not be counted with CHEM 1001 or 1101 or 1903 or 1905 or 1906 or 1909. Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Permission required for enrolment.

Chemistry 1A (Advanced) is available to students with a very good HSC performance (typically a UAI of 92.5+) as well as a very good school record in chemistry or science. Students in these categories 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 very 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.

Practical: A series of 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1902 Chemistry 1B (Advanced)

6 credit points. Semester: 2. Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 9 wks. Qualifying: CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent. Corequisite: Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH 1003 or 1903. Prohibition: May not be counted with CHEM 1002 or 1102 or 1904 or

1907 or 1908. Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.
Permission required for enrolment. Entry is by invitation.
Chemistry 1B (Advanced) is built on a satisfactory prior knowledge of Chemistry 1A (Advanced) and covers inorganic and organic chemistry. 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.
Practical: A series of 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.
Textbooks
A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

■ Commercial Law in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Discipline of Accounting and Business Law in the Faculty of Economics and Business offers the following level 3000 units. Refer to the Faculty of Economics and Business Handbook for unit descriptions.

- CLAW 3001 Australian Taxation System
- CLAW 3002 Taxation Strategies in a Business Environment.

CLAW 1001 **Commercial Transactions A**

6 credit points. Ms Kamvounias. Semester: 1, 2. Classes: (3 lectures & 1 tutorial)/week. Assessment: Exam, test, essays, classwork.
This unit 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. Basic elements of criminal law and law of torts (in particular, negligence and negligent misstatement) are then examined. 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 (elements of a contract, terms of a contract, matters affecting the validity and enforcement of contracts, termination, remedies for a breach of contract). The unit concludes with an overview of the law of agency, property partnership and business organisations.

CLAW 1002 **Commercial Transactions B**

6 credit points. Ms Pearl Rozenberg. **Semester:** 2. **Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite: CLAW** 1001. **Assessment:** One 3hr exam, assignment, quiz, classwork.
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, real property (land) and intellectual property. 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.

CLAW 2001 **Corporations Law**

8 credit points. Mrs Mescher/Ms. Wyburn. **Semester:** 1, 2, Summer. **Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** Any 4 full semester first year units of study including CLAW 1001. **Assessment:** One 3hr exam, one test, one essay classwork.
Begins with a brief comparison of business entities, especially partnership. The concept and process of incorporation are examined. Company finance, both equity and debt finance, and the maintenance of the company's share capital will be studied as well as the topics of accounts, auditors, and companies in financial difficulty. The management of companies and directors' duties will be explored as weU as the rights and remedies of company shareholders. Company takeovers, prospectus provisions and securities regulation will also be discussed but studied in more depth in the elective Stock Markets and Derivatives Law.

CLAW 2003 **Stock Markets and Derivatives Law**

8 credit points. Mrs Mescher. **Semester:** 2. **Classes:** (3 lectures & 1 seminar)/wk. **Prerequisite:** CLAW 1001 and CLAW 2001. **Assessment:** One 3hr exam, essay, test, and seminar.
Begins with a study of the powers of the Australian Securities and Investment Commission with reference to recent ASIC investigations. The functions of the Australian Stock Exchange and those of securities dealers and investment advisers will be examined and the relationship between broker and client. The market offences of market manipulation and insider trading will be explored. Public funding of companies and prospectus provisions will be studied and the liability of officers and independent experts concerning the prospectus. The topic of mergers and acquisitions will examine acquisitions, relevant interests, takeover schemes and announcements, and the liability of parties to a takeover. Exchange traded futures and options and OTC derivatives will be examined.

CLAW 2004 **Banking and Finance Law**

8 credit points. Ms J Coffey. **Semester: 1**. **Classes:** (3 lectures& 1 seminar/week). **Prerequisite:** CLAW 1001. **Assessment:** exam, tests, assignments, classwork.
Students are introduced to the regulatory structure and its impact on banking practice. The relationship between banker and customer and the duties of the parties are also analysed.

Issues relating to foreign currency litigation, electronic banking, risk management and loan security will be discussed. Students will also become familiar with the legal implications of trading negotiable instruments and raising funds by means of international loans, project financing and syndication.

CLAW 2006 **Legal Issues for ecommerce**

8 credit points. Mrs. Rozenberg. **Semester: 1,2. Prerequisite:** 48 credit points at level 1000. **Assessment:** One 3hr theory exam, one 3hr prac exam, 1 essay, quizzes, project.
Commerce and business in an electronic environment has arrived and is in constant use. This unit focuses on the transactional and financial aspects of electronic commerce. The unit includes detailed coverage of legal aspects of electronic finance - Internet banking and digital cash and cards, electronic trade - contracts and digital signatures, taxation of electronic commerce and electronic property issues - copyright, patents and trade marks for digital property.

The unit assumes no previous legal training or knowledge or knowledge of the electronic media. The unit will also cover basic introductory legal skills such as legal research and legal writing and citation as well as provide an introduction to electronic commerce, the history and operation of the Internet and major tools used in electronic commerce. Students with previous knowledge in these areas will not need to attend these sections of the unit.

CROP 1001 **Agricultural Science 1A**

6 credit points. Assoc. Prof Rose, Prof. Burgess, Assoc. Prof. Nicholas. **Semester:** 1. **Classes:** (3 lec & 3 prac)/wk. **Assumed knowledge:** HSC Chemistry. **Prohibition:** HORT1001, LWSC 1001. **Assessment:** One 2hr exam, prac, assignments.
This unit of study introduces the principles and practices of modern agriculture and examines the relationships between plants, animals and natural resources that make up agricultural production systems. The concepts of environmental and economic sustainability of agricultural systems will be introduced.

Topics covered include Australian farming systems, regional agricultural industries, farming operations and plant identification.
Practical: Field practical sessions allow 'hands-on' experience with the tillage, sowing and harvesting equipment used by Australian farmers.
Reference books
V. Squires and P. Tow (eds) Dryland Farming: a Systems Approach (Sydney University Press, 1992)
C.J. Pearson et al. A Plain English Guide to Agricultural Plants (Longman Cheshire, 1993)
M.W. Denny Air and Water: The Biology and Physics of Life's Media (Princeton University Press, 1993)

CROP 1002 **Agricultural Science 1B**

6 credit points. Assoc.Prof. Rose, Dr Sharma, Dr Cook. **Semester: 2. Classes:** (3 lec & 3 prac)/wk. **Corequisite:** CROP 1001. **Prohibition:** HORT 1002, LWSC 1002. **Assessment:** One 2 hr exam, prac, assignments.
This unit of study develops the theme of environmental sustainability of agricultural production, and examines the physical principles which underpin agricultural systems. It

examines the broad ecological relationships between the plants, animals and natural resources used in agriculture, and deals with some of the problems facing agriculture in the future. In addition, the static and dynamic forces involved in agricultural structures and equipment, the behaviour and properties of water in agricultural systems and the physical aspects of weather and the changing Australian climate will be discussed.
Practical: Laboratory and field practical sessions allow 'hands-on' experience with the equipment used by Australian farmers and feature measurement of some aspects of physical principles applied to farming operations including solar cells, the weather and tractor safety.
Reference books
V. Squires and P. Tow (eds) Dryland Fanning: a Systems Approach (Sydney University Press, 1992)
C.J. Pearson et al. A Plain English Guide to Agricultural Plants (Longman Cheshire, 1993)
M.W. Denny Air and Water: The Biology and Physics of Life's Media (Princeton University Press, 1993)

CROP 2001 **Crop Science 2**

6 credit points. Dr Campbell. **Semester:** 2. **Classes:** (3 lec & 3 prac)/wk. **Prerequisite:** CROP 1001 and CROP 1002, or HORT1001 and HORT 1002, or LWSC 1001 and LWSC1002 and BIOM 1001 or BIOM 1002. **Corequisite:** AGCH 2002. **Assessment:** One 3hr exam, lab work, report on field experiment.
This unit of study introduces students to the various aspects of plant physiology and its relevance to the production of crops and pastures.

The major sections of the course deal with:
(i) the physiology of seeds in the context of crop establishment;
(ii)cellular structure and anatomy of plants and their relevance to the physiology of the whole plant;
(iii)the processes of crop growth, including the capture of light, the use of water and the role of nutrients;
(iv)the physiology of ripening and quality of products.
Practical: The practical classes include laboratory, glasshouse and field activities. They are designed to complement the lecture topics and to enable students to acquire skills in the design, analysis and reporting of experiments.

CROP 2002 **Crop Protection 2**

4 credit points. Prof Burgess, Dr Summerell, Dr Park. **Semester:** 1. **Classes:** (2 lec & 2 prac)/wk. **Prerequisite:** CROP 1001 and CROP 1002, or HORT 1001 and HORT 1002, or LWSC 1001 and LWSC 1002 and BIOL 1001 and BIOL 1002 or1003, or BIOL 1201 and 1202. **Corequisite:** MICR 2101. **Assessment:** One 2hr theory exam, laboratory work.
This unit of study considers the impact of diseases, pests and weeds on plant production and the various strategies for protecting plants from resulting damage. Environmental issues associated with pest control are emphasised. Topics covered include an introduction to fungal plant pathogens, crop loss assessment and economic threshold of damage, the origins of pest and disease problems and epidemiology, the major pest, weed and disease problems in Australia, the use of pesticides and resistance to them, legislative aspects and the role of quarantine, and control methods for weeds, insects and pathogens.
Laboratory work includes the biology of important fungal plant pathogens, the role of chemical control measures, and case studies in integrated pest management.
Practical: Laboratory work includes the biology of important fungal plant pathogens and case studies in integrated pest management including chemical control.

CROP 3002 **Agricultural Systems & Irrigation Sci 3**

8 credit points. Dr Sutton. **Semester:** 2. **Classes:** (3 lec, 2hr prac & 1 seminar)/wk. **Prohibition:** HORT 2001 and CROP 3003. **Assessment:** One 2hrexam(60%), assignments(40%).
This unit of study introduces the principles and practice of both agricultural systems and irrigation science, with about half of the course being devoted to each. The course recognises that computer based decision aids are widespread in science and commerce. Selected examples of these will be used to illustrate the principles of efficient water use in irrigated and rainfed cropping systems and to develop efficient management strategies for them.

Irrigation farming must meet stringent environmental constraints. This unit will help you understand the scientific principles of irrigated crop water management which farm managers will need to apply to meet these constraints in a commercial environment.

Reference books
M.E. Jensen Design and Operation of Farm Irrigation Systems (ASAE, 1980)1

CROP 3003 **Agricultural Systems for Hort Science 3**

4 credit points. Dr Sutton. Semester: 2. Classes: (3 lec, 1 seminar & 2 hr prac)/wk for 1st half of semester. Prohibition: CROP 3002.
Assessment: One 2hr exam(60%), assignments(40%).
This unit of study compliments Horticultural Science 2. It builds on the irrigation component of that unit of study and uses irrigation as one of the agricultural systems which you will learn to simulate and use as a basis for developing computer based aids to decision making.

The unit of study introduces the principles and practice of agricultural systems. It recognises that computer based decision aids are widespread in science and commerce. Selected examples of these will be used to illustrate the principles of efficient water used in irrigated and rainfed cropping systems and to develop efficient management strategies for them.

■ Economic History in the Bachelor of Agricultural Economics

Units offered to students in their Second and Third Years of study by the Discipline of Economic History in the Faculty of Economics and Business. Refer to the Faculty of Economics and Business Handbook for unit descriptions.

- ECHS 2302 Asia-Pacific: Growth and Change
- ECHS 2303 Economic Development of Southeast Asia
- ECHS 2304 Economic Development of Modern Japan
- ECHS 2306 The Managerial Firm: Evolution and Attributes
- ECHS 2312 Topics in Modern European Social History
- ECHS 2313 The History of Modern European Expansion
- ECHS 2324 The Asian Firm
- ECHS 2328 The Politics of e-Commerce

■ Econometrics in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Discipline of Econometrics and Business Statistics in the Faculty of Economics and Business offers the following level 2000/3000 units. Refer to the Faculty of Economics and Business Handbook for unit descriptions.

- ECMT 2720 Management Science
- ECMT 3710 Management Science Models and Methods
- ECMT 3720 Stochastic Modelling for Management.

ECMT 1013 **Econometrics 1A Stream 3**

6 credit points. Semester: 1, 2, Summer. Assumed knowledge: HSC Mathematics 2U. Prohibition: MATH 1005, MATH 1905.
Same as 1011 but classes are streamed according to mathematical background to improve teaching and learning.

ECMT 1023 **Econometrics 1B Stream 3**

6 credit points. **Semester:** 2, Summer. **Assumed knowledge:** Mathematics. **Corequisite:** ECMT 1013. **Prohibition:** MATH 1005, MATH 1905.
Other than in exceptional circumstances, it is strongly recommended that students do not undertake Econometrics 1B before attempting IA.
Same as ECMT 1021, but classes are streamed according to mathematical background to improve teaching and learning.

ECMT 2010 **Regression Modelling**

8 credit points. **Semester:** 1. **Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** ECMT 1010 and ECMT 1020. **Assessment:** One 3hr exam, tests, assignments.
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. We demonstrate 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 analyzing data. An important task will be the computing component using econometric software.

ECMT 2030 Financial Econometrics
8 credit points. **Semester:** 2. **Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** ECMT 2010. **Assessment:** One 3hr exam, tests, assignments.
Over the last decade econometric modelling of financial data has become an important part of the operations of merchant banks and major trading houses and a vibrant area of employment for econometricians. This unit aims to provide an introduction to some of the widely used econometric models for financial data and the procedures used to estimate them. Special emphasis will be placed upon empirical work and applied analysis of real market data. Topics covered may include the statistical characteristics of financial data, the specification, estimation and testing of asset pricing models, the analysis of high frequency financial data, and the modelling of volatility in financial returns.

ECMT 3010 Econometric Models and Methods
8 credit points. **Semester:** 1. **Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** ECMT 2010. **Assessment:** One 3hr exam, tests, assignments.
Methods of estimation and testing developed in association with regression analysis are extended to cover econometric models involving special aspects of behaviour and of data. In particular, motivating examples will be drawn from dynamic models, panel data and simultaneous equation models. In order to provide the statistical tools to be able to compare alternative methods of estimation and testing, both small sample and asymptotic properties will be developed and discussed.

ECMT 3020 Applied Econometrics
8 credit points. **Semester: 2. Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** ECMT 3010. **Assessment:** One 3hr exam, tests, assignments.
Econometric theory provides the techniques needed to qualify the strength and form of relationships between variables. Applied econometrics is concerned with the strategies that need to be employed to use these techniques effectively. This unit illustrates how econometric models and methods can be applied to data to solve problems that arise in economics and business. General principles for undertaking applied work will be discussed and necessary research skills developed. In particular we stress the links between econometric models and the underlying substantive knowledge or theory associated with the particular application. Topics may include error correction models, systems of consumer demand equations, and structural and vector auto-regressive (VAR) macroeconomic models. Research papers involving empirical research will be studied and an integral component of the unit will be a major project involving a substantial piece of econometric modelling.

ECMT 3030 Forecasting for Economics and Business
8 credit points. **Semester: 1. Classes:** (3 lectures & 1 tutorial)/week. **Prerequisite:** ECMT 2010. **Assessment:** One 3hr exam, tests, assignments.
The need to forecast or predict future values of economic time series arises frequently in many branches of applied economic and commercial work. It is, moreover, a topic which lends itself naturally to econometric and statistical treatment. The specific feature which distinguishes time series from other data is that the order in which the sample is recorded is of relevance. As a result of this, a substantial body of statistical methodology has developed. This unit is intended to provide a first course in methods of time series analysis and forecasting. The material covered will be primarily time domain methods designed for a single series and will include the building of linear time series models, the theory and practice of univariate forecasting and the use of regression methods for forecasting. Throughout the unit a balance will be maintained between theory and practical application.

■ Economics in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Discipline of Economics in the Faculty of Economics and Business offers the following level 2000/3000 units. Refer to the Faculty of Economics and Business Handbook for unit descriptions.

- ECON 2901 Intermediate Microeconomics Honours
- ECON 2902 Intermediate Macroeconomics Honours
- ECON 3001 Capital and Growth
- ECON 3002 Development Economics
- ECON 3003 Hierarchies, Incentives and Firm Structure
- ECON 3004 History of Economic Thought
- ECON 3005 Industrial Organization
- ECON 3006 International Trade
- ECON 3007 International Macroeconomics
- ECON 3008 Labour Economics
- ECON 3009 Markets, Regulation and Government Policy
- ECON 3010 Monetary Economics
- ECON 3012 Strategic Behaviour.

ECON 1001 Introductory Microeconomics
6 credit points. **Semester:** 1, Summer. **Assumed knowledge:** Mathematics.
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 degree (BEc), and an alternative core unit for the Bachelor of Commerce and the Bachelor of Economics (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.

ECON 1002 Introductory Macroeconomics
6 credit points. **Semester:** 2, Summer. **Assumed knowledge:** Mathematics.
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 degree (BEc) and for the Bachelor of Commerce degree and an alternative core course for the Bachelor of Economics (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.

ECON 2001 Intermediate Microeconomics
8 credit points. **Semester:** 1, Summer. **Prerequisite: ECON 1**001**. Corequisite:** ECMT 1010.
Certain combinations of Maths/Stats may substitute for Econometrics - consult Head, Discipline Discipline.
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.

ECON 2002 Intermediate Macroeconomics
8 credit points. Semester: 2, Summer. **Prerequisite:** ECON 1002. **Corequisite:** ECMT 1020.
Certain combinations of Maths/Stats may substitute for Econometrics - consult Head, Economics Discipline.
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 course, 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.

ENT01001 Agricultural Entomology 1
4 credit points. Assoc. Prof. Rose. Semester: 2. Classes: (2 lec & 2 prac)/wk. Assessment: One 2hr exam, classwork, insect collection.
This unit of study aims to give an introduction to insects and related animals and their importance to agriculture.

Topics covered include morphology, classification, physiology, ecology and behaviour, and principles of insect pest control.
Practical: Practical classes deal briefly with insect morphology and classification and some information on economic pests of agriculture.

ENTO 4001 **Agricultural Entomology 4A**
24 credit points. **Semester: 1. Prerequisite:** ENTO 1001. **Corequisite:** ENTO 4002.
A full-year specialisation which comprises the following units of study:
Insect Taxonomy: Theory of systematics and techniques used by taxonomists are discussed. Classification to family level of some orders is included in the practical course.
Ecology: This unit of study is given by the School of Biological Sciences.
Reading: A list covers areas in entomology that are not covered in other sections of the unit of study and allows students to concentrate on areas of interest.
Project: Students undertake research projects throughout the year under supervision by staff members.
Insect Collection: Students are required to make a small but representative collection of insects.
Textbooks
I.D. Naumann (ed.) Systematic and Applied Entomology (Melbourne U.P., 1994)

ENTO 4002 **Agricultural Entomology 4B**
24 credit points. **Semester: 2. Prerequisite:** ENT01001. **Corequisite:** ENTO 4001.
See ENTO 4001 Agricultural Entomology 4A
Textbooks
See Agricultural Entomology 4A

ENV11001 **Global Geology**
6 credit points. **Semester:** 1. **Classes:** 3 lec & prac/tut/wk. **Assessment:** One 2hr exam, class work.
The unit of study serves as an introduction to environmental geology by examining global geological processes and their controls on the human environment. The unit of study explores the origin of the Earth within the developing Solar System and traces the evolution of the Earth's hydrosphere, atmosphere and biosphere through geological time. Other topics include plate tectonics, and the influence of volcanic activity, earthquakes and other geological hazards on human occupation of the planet. The unit of study includes an examination of minerals and rocks as an introduction to the study of the Earth's mineral and energy resources.
Students considering enrolling in this unit of study should study the pamphlet on the Junior unit of study in Geology, obtainable from the Enquiry Office in the Edgeworth David Building. It gives details of unit of study content, text and reference books, staffing and other relevant matters.

ENV11002 **Geomorphic Environments and Change**
6 credit points. **Semester:** 2. **Classes:** 3 lec & prac/tut/wk. **Assessment:** One 2hr exam, class work.
This unit of study completes the introduction to environmental earth sciences by examining geographical scales of environmental concern, such as catchments, river basins, hydrology and land-use. The unit then progresses on to the basic microbiological aspects of the environment and how we can use these to our benefit. Students will begin to learn how to integrate information from related disciplines to understand relationships between the sciences and the environment and to produce solutions to environmental problems. This will be a continuing theme throughout the Environmental Science program.

ENVI3003 **Law and the Environment**
4 credit points. Semester: 1. Classes: 3 lec/wk. Prerequisite: Entry by permission of Course Coordinator only. Prohibition: May not be counted with ENVI 3001. Assessment: Continual throughout semester.
Permission required for enrolment. Available for Study Abroad students and students enrolled in Land and Water Science only.
This unit encompasses the core material of ENVI 3001 and covers topics in environmental ethis, law, planning, regulation and management for the built and natural environments.

ENVI 3004 **Environmental Impact Assessment**
4 credit points. Semester: 2. Classes: 3 lec/wk. Prerequisite: Entry by permission of Course Coordinator only. Prohibition: May not be counted with ENVI 3002. Assessment: Continual throughout semester.
Permission required for enrolment. Available for Study Abroad students and students enrolled in Land and Water Science only.
This unit encompasses the core material provided in ENVI 3002 and covers topics in environmental impact and risk assessment.

■ Finance in the Bachelor of Agricultural Economics

Units offered by the Discipline of Finance in the Faculty of Economics and Business follow this entry. BAgrEc students are not normally permitted to enrol in Honours units.

FINC 2001 **Corporate Finance I**
8 credit points. Semester: 1, Summer. Classes: 2hrs lectures, 1hr workshop & 1 hr tutorial/week. Prerequisite: ECON 1001 and ECON 1002 and ECMT1010 and ECMT1020 and ACCT1001 (or ACCT1003). Assessment: One 3hr exam, assignments, mid semester test.
Study in Finance commences in second year.
Provides an introduction to corporate finance, including investment decision-making. The first part deals with the analytical techniques necessary to make investment decisions, both when cash flows are known and when they are uncertain. The second part deals with the corporation and the Australian capital market, the raising of capital, including equity versus debt, and allocating capital, including dividends, internal investments and takeovers. As far as possible, the unit will attempt to link theory to practical applications via examples, exercises and assignments.

FINC 2002 **Corporate Finance II**
8 credit points. **Semester:** 2, Summer. **Classes:** 2hrs lectures, 1hr workshop & 1 hr tutorial/week. **Prerequisite: As** for **FINC** 2001**. Corequisite:** FINC 2001. **Assessment:** One 3hr exam, assignments,' mid semester test.
Builds on FINC 2001: Corporate Finance I, but is more applied in that it is concerned with the actual workings of financial markets. It examines the operation of financial markets from both a theoretical and practical perspective, concentrating mainly but not exclusively on Australian financial markets. The unit deals with the economic role of capital markets and theories of capital market behaviour. The operations of equity and derivative markets in Australia, including options and futures, are examined along with foreign exchange and debt markets. A new and important area of study known as 'market microstructure' is introduced and a number of issues in corporate governance and take-overs are examined.

FINC 2004 **Introductory Mathematical Finance**
8 credit points. Semester: 2. Classes: (2 hrs lectures +1 tutorial)/week plus additional workshops as required. Assumed knowledge: It is recommended that students reach the level of HSC 3 unit Mathematics prior to undertaking the unit. It is also recommended but not required that students either undertake the Maths/Stats major or avail themselves of units offered in Mathematics and Statistics. Other recommended units providing a useful background include ECON 2001, ECON 2901 and ECON 2903. Prerequisite: ECON 1001 and ECON 1002 and ECMT 1010 and ECMT 1020 and ACCT 1001 (or ACCT 1003). Corequisite: FINC 2001. Assessment: One 3hr exam, assignments.
The principle objective of this unit is to introduce students to the basic elements of the rapidly burgeoning field of Mathematical Finance. Students are exposed to key areas in the modern theory of finance and corporate financial policy with specific emphasis on their development and treatment from rigorous mathematical and statistical foundations. The unit will provide some of the necessary maths background so that the subject is reasonably self-contained. Topics that are introduced from a more mathematical perspective include principles of modern financial valuation and analysis; asset pricing theory and market efficiency; theory of portfolio selection and management; and measurement and management of financial risk.

FINC 3001 **International Financial Management**
8 credit points. Semester: 2, Summer. Classes: (2 hrs lectures +1 tutorial)/week. Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. Assessment: Two, 2 hr exams; project; assignments.
Markets are increasingly globalised. There are very few businesses or industries that are not required to deal with issues such as foreign currency, foreign competition and direct investment. This unit of study is designed to allow students to extend their understanding of basic principles in finance to an international environment. Globalisation of markets introduces risks but also opens up profitable opportunities.
Topics covered include foreign currency valuation and markets, international parities conditions, measuring and managing foreign exposure, international portfolio management,

capital budgeting and foreign direct investment, international tax management and international financing strategy.

FINC 3002 Derivative Securities

8 credit points. **Semester:** 1, Summer. Classes: (2 hrs lectures and 1 tutorial)/week; one workshop session (not every week). **Prerequisite:** FINC 2001 and (FINC 2002 or FINC 2004), and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Assessment:** One report/sem, exams, assignment, tests.

Options, futures and swaps are derivatives of underlying securities such as equities and bonds. These relatively new and rapidly growing types of securities are increasingly used to manage risk exposure and as a relatively low-cost-way of taking a position in a security or portfolio. They are also being used as part of senior management compensation as a way of attempting to align the interests of shareholders with that of management.

The unit is designed to provide an introduction to this important area of finance without requiring on the part of students a high level of mathematical sophistication. Students will gain exposure to the operations of the Sydney Futures Exchange (SFE) and the Options Exchange and some may even choose to enhance their learning experience by investing small sums on these exchanges.

FINC 3003 Corporate Control

8 credit points. **Semester: 1**. **Classes:** (2 hrs lectures and 1 tutorial)/ week plus additional workshops as required. **Prerequisite:** FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Assessment:** Major practical assignment, several small exercises, one 3 hr exam.

The finance sector requires many professionals to advise and assist in the process of new company formation and listings on the stock exchange, acquisitions, mergers, restructurings, issuance of new debt and equity, board structure and composition including outside directors, structuring of executive compensation packages and the like. These activities generally fall under the rubric of corporate control, or in more modern academic parlance, 'corporate governance'.

This unit will focus on how corporations are formed, how ownership and control is allocated, and how it changes hands through takeovers, bankruptcies, and reorganisations. The following are provided as examples of the sorts of topics to be covered: how the internal labour market and 'pay for performance' within firms impinges on the firm's capital structure; the role and nature of takeover bids and corporate restructuring; the questionable condemnation of 'management entrenchment'; the packaging of cashflow and control rights; the 'dual class' share controversy and 'super-voting' shares; leveraged buyouts; employee ownership and profit-sharing; the choice between debt, equity, and more complex securities; corporate governance including boards, active investors and regulators; and Anglo-American style firms versus the 'main bank' systems of Japan and Germany.

Textbooks

R.A.G. Monks and N.Minow, 'Corporate Governance for the 21st Century: Watching the Watchers' (Blackwell Business, 1996)

FINC 3004 Trading and Dealing in Security Markets

8 credit points. **Semester:** 2. **Classes:** (2 hrs lectures +1 tutorial)/week. **Prerequisite:** FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. Assessment: One 3hr exam, assignments.

The purpose of this unit is to provide students with a detailed working knowledge of Australia's exchange based securities markets. The emphasis is on understanding:

- patterns of trading behaviour within and between markets;
- the three main features of the markets, namely transaction costs, liquidity and volatility;
- the roles played by:

(i) institutional versus private investors;
(ii)brokers and market-makers;
(iii)principal and agency trading;
(iv)informational technology;
(v) regulation.

The broad aim of the unit is to provide students with both a practical appreciation of the institutional structure of exchange-based securities markets and a thorough research grounding in the techniques which lead to this understanding, namely the relatively new discipline known as 'security market microstructure'.

As an aid to learning the unit is currently being developed to include UniSMARTS, a market surveillance tool used by several exchanges.

FINC 3005 Cases in Managerial Finance

8 credit points. **Semester:** 2. **Classes:** (2 hrs lectures and 1 tutorial)/ week, one workshop session (not every week). **Prerequisite:** FINC 2001 and (FINC 2002 or FINC 2004); and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Assessment:** One 3hr exam, assignment, tests.

This is a capstone unit of study which focuses on the application of financial principles and methods to develop up-to-date problem solving techniques using an applied case study approach. The unit of study pulls together important contributions from earlier units in the finance major. Cases include issues in capital budgeting and cost of capital, financial decision making, financial statement analysis, international financial management, dividend policy and mergers and acquisitions, and investments. In addition to lectures, the unit is based around computer lab workshops and a competitive computer simulation game. There is a strong emphasis on working in teams to solve common problems.

FINC 3007 Investments and Portfolio Management

8 credit points. Semester: 1. Classes: (2hrs lectures +1 tutorial)/week. Prerequisite: FINC 2001 & (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. Assessment: One mid-term exam (two hours), one final exam (two hours), one project.

This course is designed to provide a comprehensive analytical approach to the modern theory of Investments. Topics covered include the valuation of bonds and stocks, mean-variance analysis, Markowitz type portfolio analysis, duration and convexity analysis, term structure of interest rates, option pricing, portfolio insurance, performance evaluation, and forecasting. Basic statistics and probability concepts will be reviewed at the beginning to ensure that all students have adequate understanding. Although mere will be a definite attempt to stress the analytical aspects of Investments theory, there will be also an equal amount of emphasis on the intuitive as well as practical aspects of the subject.

FINC 3008 Bank Financial Management

8 credit points. **Semester:** 2. **Classes:** 2 hrs lectures +1 tutorial/week. **Prerequisite:** FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Assessment:** One 3hr exam, assignments.

This subject's central objective is to expose students to the basic principles of commercial bank management. The topics that are covered include: the theory and practice of banking from a financial management perspective; banks and the financial services industry; regulatory restrictions and financial management; performance analysis and strategic planning; asset management; performance analysis and strategic planning; asset management - liquidity; investment and loan management; liability and deposit management; capital structure and dividend decisions; and financial management implications of electronic banking, international banking, and other developments.

GENE 2001 Agricultural Genetics 2

6 credit points. Dr Sharp, Dr Darvey, Assoc. Prof. Moran, Assoc. Prof. Nicholas. Semester: 2. Classes: (3 lec, 1 tut & 2 prac)/wk. Prerequisite: BIOL 1201 and BIOL 1202 or BIOL 1001 and BIOL 1002, BIOM 1001. Assessment: One 3hr exam, tests, assignments.

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.

GENE 4001 Agricultural Genetics 4A

24 credit points. Dr Darvey, Dr Sharp, Assoc. Prof. Moran, Assoc. Prof. Nicholas. Semester: 1. Prerequisite: BIOM 2001, GENE 2001.

The coursework is designed for students wishing to concentrate on those areas of genetics or breeding which are seen as most relevant to their present interests and career prospects. Students should consult with the relevant departments in determining course combinations. Units of study at Cobbitty may be run as intensives either during or between semesters.

(a) Cytogenetics (Cobbitty) (6 credit points). 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.

(b) Plant Breeding (Cobbitty) (6 credit points). 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.

(c) Population Genetics and Animal Improvement (Camden) (8 credit points). A series of lectures and practical periods, dealing with population genetics, quantitative inheritance and animal breeding given by the Department of Animal Science.

(d)Prokaryote and Eukaroyote Molecular Genetics (Main Campus) (12 credit points). Lectures and laboratory classes given in the School of Biological Sciences.

(e) Molecular Genetics and Breeding (Cobbitty) (6 credit points). Lectures and laboratory work covering the structure and functions of plant genomes and genes, the technology and results of DNA transformation, and the analysis of agronomic traits by both molecular techniques and by genetic mapping using molecular and other genetic markers.

(f) Animal Genetics (Main Campus) (4 credit points). A series of lectures covering those aspects of genetics that are relevant to animals, with particular emphasis on the genetic basis of animal disease. Topics include biochemical disorders, chromosomal abnormalities, non-Mendelian disorders, immunogenetics, pharmacogenetics, genetic variation in pests, parasites and pathogens, and genetic and environmental control of disease.

(g) Project (compulsory) (6-18 credit points).

(h) Any other 6-credit point unit with the approval of the Head of Department.

GENE 4002 Agricultural Genetics 4B

24 credit points. **Semester: 2. Prerequisite:** BIOM 2001, GENE 2001. **Corequisite:** GENE 4001.

See GENE 4001 Agricultural Genetics 4A.

GEOG 1001 Biophysical Environments

6 credit points. Assoc. Prof. Short, Dr Gale. **Semester: 1. Classes:** 3 lec & 3hr prac/wk. **Assessment:** One 2hr exam, 1500w report, prac assignments.

This unit of study provides an introduction to the earth's biophysical environments. It begins by considering the earth's place in the universe, its origin and its development, and the nature and evolution of the earth's structure. This is followed by an investigation of the evolution of the earth's physical environment and its development to its present stage over time. With this background, the unit of study goes on to examine the earth's hydrosphere and atmosphere and the major landforms produced by the interaction of atmospheric and ocean processes with the earth's surface, including fluvial, arid, coastal and glacial systems.

Practical: Field excursion one half day/sem

GEOG 1002 Human Environments

6 credit points. Prof. Connell & Dr W Pritchard. **Semester: 2. Classes:** 3 lec & 3hr prac/wk. **Assessment:** One 2hr exam, 2000w essay, prac exercises.

Human Environments develops understanding of processes and consequences of interactions among people and between people and their environments. Questions, challenges and issues that stem from the relationships and transformations in the built, natural, social and spatial environments are introduced and scrutinised. Social structures and development are explored and principles of human geography are presented through study of the location and distribution of economic activities with special reference to Australia and the Asia-Pacific region.

GEOG 2001 Processes in Geomorphology

8 credit points. Associate Professor D Dragovich and others. **Semester: 1. Classes:** 3 lec & 5 prac or field/wk. **Prerequisite:** 36 credit points of Junior units of study, including GEOG 1001 orENV11001 or1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. **Assessment:** One 2hr exam and 1500w essay or prac papers.

This unit of study is concerned with the geomorphology of global environments, as mega-landforms and the processes that shape them. The major focus is on continental-scale landforms and the long term processes which shape the physical platform which is the home, workplace and exploitation surface of humankind.

GEOG 2002 Fluvial and Coastal Geography

8 credit points. Dr P Cowell & others. Semester: 2. Classes: 3 lec & 5 prac or field/wk. Prerequisite: 36 credit points of Junior units of study, including GEOG 1001 or ENV11001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. Prohibition: May not be counted with GEOG 2302 or 2303 or MARS 2002. Assessment: One 2hr exam, 1500w essay or prac reports.

Other Information: As for GEOG 2001

Physical Geography stream: This unit of study focuses not on global, but meso- and micro-scales on two of the major morphostratigraphic systems, namely fluvial and coastal geomorphology. Both provide introductory analyses of rivers and coasts, so fundamental to understanding the physical environments which affect the sustainability of these regions.

GEOG 2101 Environmental Change and Human Response

8 credit points. Associate Professor D Dragovich & Dr Chapman. **Semester: 1. Classes:** 3 lec & 2 prac & field/wk. **Prerequisite:** 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1001 or 1002. **Assessment:** One 2hr exam, 2000w essay or prac reports.

Other Information: As for GEOG 2001

Environmental Geography stream: Environmental change occurs at time scales from seconds to centuries or longer, from the sudden and catastrophic to gradual transformations barely noticeable at human time scales. Some kinds of environmental change are largely caused by humans, but in other cases humans are helpless before the uncontrollable forces of nature. Environmental change is explored in all of these categories. Consideration is given to land degradation problems such as soil erosion and desertification, and how humans are both implicated in these problems and respond to them. We also study environmental hazards like floods and bushfires, and how we may (or in some cases may not) effectively manage them. Included in the unit of study will be a variety of techniques for the analysis of environmental problems.

GEOG 2102 Resource and Environmental Management

8 credit points. Dr Hirsch and Dr McManus. **Semester: 2. Classes:** 3 lec & 5hr tut or prac or fieldwork/wk. **Prerequisite:** 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENV11001 or 1002. **Assessment:** One 2hr exam, 2000w essay, tut papers, prac and fieldwork report/s.

Other Information: As for GEOG 2001

Environmental Geography stream: This unit of study forms part of the Environmental Geography and Resource Management stream which is designed to evaluate human interaction with the biophysical environment and use of the earth's surface and its resources. Emphasis is upon human impacts on environments through social, economic and political processes and through deliberate decision making and management. Policy responses are considered at a range of scales. The unit of study examines the nature and characteristics of selected resource processes with reference to Australian (and, as appropriate, other national and international) contexts, and, on a more global and regional scale, focuses on the changing relationship between people and environments in tropical Asia and the Pacific.

GEOG 2201 Cultural and Economic Geography

8 credit points. Prof Connell, Dr W Pritchard. Semester: 1. Classes: 3 lec & 5hr tut or prac or fieldwork/wk. Prerequisite: 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENV11002 or ECOP 1001 or 1002. Assessment: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

Other Information: As for GEOG 2001

Human Geography stream: This unit of study exams the spatial processes that underpin cultural and economic activity. Two themes dominate: firstly cultural and economic activities are defined by multiple sets of spatial relations; and secondly, that economic and cultural processes and practices are by necessity inter-related. These arguments provide the entry points for debate on the social construction of economic and cultural spaces, with specific attention to topics including urban change and gentrification; ethnicity; the geographies of global financial flows; and the development of industrial clusters. The unit also develops arguments relating to the economic and cultural geographies of food production and consumption.

GEOG 2202 Urban and Political Geography

8 credit points. Lecturers to be advised. Semester: 2. Classes: 3 lec & 5hr tut or prac or fieldwork/wk. Prerequisite: 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENV11002 or ECOP 1001 or 1002. Assessment: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

Other Information: As for GEOG 2001.

Human Geography stream: This unit of study starts by examining urban processes and problems in developed and developing countries. For developed countries, the focus is on urban economies, suburbs, urban politics, and the nature of the built environment. For developing countries, urbanisation trends and the ideologies of planning policies are considered. The unit of study considers the political constructions of space, with specific reference to issues of sovereignty and the changing character of political borders and divisions. Topics include diasporas, refugee policies, the role of culture in nationalism, and global geopolitical trends.

GEOG 2302 Fluvial Geomorphology

6 credit points. Lecturers to be advised. Semester: 2. Classes: 3 lec, 3 prac & 1 tut/wk. Prerequisite: GEOG 2001 or 36 credit points of Junior units of study including GEOG 1001 or ENV11001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of Junior units of study in Biology, Chemistry and Mathematics. Prohibition: May not be counted with GEOG 2002 or 2303. Assessment: One 2hr exam, one essay, one project.

Other Information: as for GEOG 2001.

This unit will provide an introduction to fluvial processes and morphology, with particular reference to the Australian environment. The unit will take a holistic view of the fluvial system, emphasising that stream characteristics are an outcome of interrelated variables operating at different scales within the catchment. It will include a description of catchment characteristics; water and sediment delivery, conveyance and influence on channel morphology; floods and floodplains; natural and anthropogenic channel change; groundwater issues; and estuarine sedimentation.

GEOG 2303 Fluvial and Groundwater Geomorphology

8 credit points. Dr M. Neave, Dr. R.W. Vervoort. Semester: 2. Classes: 3 lec, 3 prac & 2 fieldwork/wk. Prerequisite: GEOG 2001 or 36 credit points of Junior study including GEOG 1001 or ENV11001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology, Chemistry and Mathematics. Prohibition: May not be counted with GEOG 2002 or GEOG 2302. Assessment: One 2 hr theory exam, 1 essay, 2 projects.

Other Information: as for GEOG 2001

This course will provide an introduction to fluvial processes, morphology and groundwater hydrology, with particular reference to the Australian environment. The course will take a holistic view of the fluvial system, emphasising that stream characteristics are the result of many factors operating at different scales across the entire catchment. An introduction in groundwater hydrology will introduce aquifer flow and water quality concepts as well as the interaction between aquifers and the over- and underlying strata. A modelling project using MODFLOW will be given to study the effects of a contamination on a groundwater supply.

Geography units

Geography is a varied and versatile subject covering a broad spectrum of knowledge. It was once concerned principally with the description of the earth, but modern geography now embraces society's relationship with the earth within a scientific and highly-structured framework. Currently there are three main elements of Geography actively pursued by the Division. Aspects of Physical Geography deal with phenomena such as landforms, plants and soil as elements of physical landscapes. Human geography consists mainly of social and economic geography and is concerned with such features as rural and urban settlements, cultural influences and way of life. Economic geography includes the study of agriculture, industry, transport, marketing and resources. Environmental geography is concerned with the human/land relationships. This was a traditional theme used as early as in Griffith Taylor's time in the 1920s. It has come to the forefront with contemporary concerns for the environment. However, these three divisions are arbitrary, and some courses involve integration of various aspects of them all.

As theoretical understanding and quantitative precision have advanced, geography has developed as a useful discipline for analysing and proposing solutions to practical problems. Geographers have proved their value in such fields as local government, town and regional planning, decentralisation and environmental management.

Conducted field excursions

Students in Junior courses are required to attend two one-day excursions to localities within about 150 km of Sydney. In Intermediate and Senior courses, students are required to take part in long excursions, of about a week's duration, based on a centre remote from Sydney. However, in physical and environmental geography, there may be the chance of substituting for this remote excursion by having a number of days each semester in the field (up to five days each semester). Those who wish to apply for an interest-free loan to enable them to meet the costs of excursions should consult the SRC and the financial assistance section of the central administration.

Excursion work will be assessed by written assignment and/or examination. Exemption from excursions will only be granted under exceptional circumstances. Requests for exemption must be submitted in writing to the Head of Division.

Geography handbook

Further details of unit descriptions, departmental activities, excursions, and other relevant material are contained in the Geography Handbook available from the Enquiry Office in the Institute Building.

Geography Senior units

The Division offers six senior units of study in 3 streams. Each unit of study consists of three lectures and the equivalent of nine hours assigned work (which may comprise tutorials, practicals, individual course work and/or fieldwork) weekly. All students are required to attend compulsory one to three day field excursions associated with each unit of study which are held within the semester. Some units hold two or three such excursions.

Unit descriptions can be found in the Faculty of Science Handbook.

- GEOG 3001 Coastal Environments and Dynamics
- GEOG 3002 Environmental Geomorphology
- GEOG 3101 Catchment Management
- GEOG 3102 Coastal Management and GIS
- GEOG 3201 Asia Pacific Development
- GEOG 3202 Sustainable Cities and Regional Restructuring.

■ Government in the Bachelor of Agricultural Economics

In addition to the Level 1000 units which follow this entry, the Discipline of Government and International Relations in the Faculty of Economics and Business also offers the following units of study to students in their Second and Third Years of study. Refer to the Faculty of Economics and Business Handbook for unit descriptions.

- GOVT 2091 Government 2 Honours
- GOVT 2101 Human Rights and Australian Politics
- GOVT 2104 The Australian Political Party System
- GOVT 2106 Australian Foreign & Defence Policy
- GOVT 2201 International Politics of Economic Relations
- GOVT 2205 International Security in the 21 st C
- GOVT 2303 Media Politics
- GOVT 2404 European Politics in Transition
- GOVT 2410 Globalisation and National Government
- GOVT 2502 Policy Analysis
- GOVT 2507 Public Sector Management
- GOVT 2605 Ethics and Politics
- GOVT 2606 Modernity and Politics
- GOVT 2701 Politics and Society in Modern Middle East
- GOVT 2702 Israel, Palestinians and the Arab States
- GOVT 2703 Consultation: Community, Business, Govt.

GOVT 1101 Australian Politics

6 credit points. Semester: 1,2. Classes: (2 lectures & 1 tutorial)/week. This unit aims to introduce 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 will be examined as arenas of power, conflict and consensus. Who rules? How? Which groups are excluded?

GOVT 1202 **World Politics**

6 credit points. Semester: 1,2, Summer. Classes: (2 lectures & 1 tutorial)/week.

Introduces the student to the major concepts and approaches of international relations. It will take the student through the traditional theories of international relations, and go on to look at the most recent developments within the discipline. It may look at the uses and problems of the comparative method. Themes examined include, the question of order and conflict in world politics, first-third world economic relations and feminist and critical approaches to traditional international relations theory. Students will be equiped with a broad theoretical understanding of international relations as well as an insight into other disciplines, notably politics in general, sociology and economics.

GOVT 1207 **Global Politics and the Environment**

6 credit points. **Semester:** 1.

Global environmental problems are often regarded as part of a 'new agenda' in international relations, potentially requiring a re-evaluation of traditional notions of international politics such as national sovereignty and security. This unit will examine the adequacy of more traditional notions of international politics in the light of the potential challenges posed by global environmental problems. The aims of the unit are to introduce students to the basic concepts employed in the study of international politics, the political nature of global environmental problems and the connection between these problems and processes of 'globalisation' and 'modernisation'. The unit covers issues such as the nature of the international politics, the influence of non-state actors (eg, environmental movements, international environment agencies), the link between scientific knowledge and political action, international equity and environmental problems (the North/South debate), etc.

GOVT 1609 **Ethnicity, Nationalism and Citizenship**

6 credit points. **Semester:** 1.

Decay of Empires like the Ottoman and Soviet unleashes nationalist forces that seem to involve an infinite regress: fragmentation into the smallest ethnic units. What is duty-worthy in the nation? Ties of blood and soil, like those of family, clan and tribe, characterise primordialism rather than ethical behaviour as such. Is this a truth or merely the way that we persuade ourselves that nationalism, racism and ethnicity are intractable to morality, beyond good and evil? Are philosophical reflection and ethical consciousness solvents of primordialism, and can multi-ethnic polities hold it at bay? These, the burning questions of post-modernity, which have been raised at critical junctures in the development of the state, and answered by theorists ancient as well as modern, will be the focus of this unit.

HORT1001 **Horticultural Science 1A**

6 credit points. Assoc.Prof. Rose, Prof. Burgess, Assoc. Prof. Maxwell, Dr McConchie. **Semester:** 1. **Classes:** (3 lec & 3 prac)/wk, excursion. **Assumed knowledge:** HSC 2 unit Chemistry or 3 unit Science. **Prohibition:** CROP 1001, LWSC 1001. Assessment: One 2hr exam, prac.assignments.

This unit of study introduces the principles and practices of modern horticulture and agriculture and examines the relationships between the plants, animals and natural resources which make up production systems. The concepts of environmental and economic sustainability of horticultural and agricultural systems will be introduced.

Topics covered include Australian farming systems, regional horticultural and agricultural industries, farming operations and plant identification.

Practical: Field and laboratoryl sessions allow 'hands-on' experience in plant identification, propagation and equipment used by horticulturalists and provide an overview of horticultural industries in the Sydney region.

Reference books

V. Squires and P. Tow (eds) Dryland Fanning: a Systems Approach (Sydney University Press, 1992)

C.J. Pearson et al. A Plain English Guide to Agricultural Plants (Longman Cheshire, 1993)

M.W. Denny Air and Water: The Biology and Physics of Life's Media (Princeton University Press, 1993)

HORT 1002 **Horticultural Science 1B**

6 credit points. Assoc.Prof. Rose, Dr Sharma, Dr Cook. **Semester:** 2. **Classes:** (3 lec & 3 prac)/wk. **Corequisite:** HORT 1001. **Prohibition:** CROP 1002, LWSC 1002. **Assessment:** Assessment one 2 hr exam, prac, assignments.

This unit of study develops the theme of environmental sustainability of horticultural and agricultural production, and examines the physical principles which underpin these production systems and the broad ecological relationships between plants, animals and natural resources used in horticulture and agriculture. Current and future ecological issues facing horticulture and agriculture are discussed. In addition, the static and dynamic forces involved in horticultural and agricultural structures and equipment, the behaviour and properties of water, and the physical aspects of weather and the Australian climate will be discussed.

Practical: Laboratory and field practical sessions allow 'hands-on' experience with the equipment used by Australian farmers and feature measurement of some aspects of physical principles applied to fanriing operations including solar cells, the weather and tractor safety.

Textbooks

See HORT 1001 Horticultural S c i e n c e 1A

HORT 2001 **Horticultural Science 2**

6 credit points. Dr McConchie, Dr Sutton. **Semester: 2. Classes:** (3 lec & 3 prac)/wk. **Prerequisite:** HORT 1001 & HORT 1002 or CROP 1001 and CROP 1002 ot LWSC 1001 and LWSC 1002. **Corequisite:** CROP 2001. **Assessment:** One 3hr exam, assignments, prac book.

The unit of study covers topics on plant identification and plant use, horticultural production systems and irrigation. Topics in plant identification include identification of specific families. Horticultural production systems covers topics on the physiology and growth of perennial crops with special emphasis on management activities during winter/spring. The irrigation component discusses the application of scientific principles to the efficient and ecologically sound management of irrigation systems.

Reference book

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

P. Baxter & P. Tankard Growing Fruit in Australia (Macmillan Australia, 1990)

M.E. Jensen Design and Operation of Farm Irrigation Systems (American Society of Agricultural Engineers, 1980)

HORT 3001 **Horticultural Science 3**

8 credit points. Dr McConchie. **Semester: 1. Classes:** (3 lec, 2 workshops, 1 prac & 2 excursions)/wk (including 1 two and a half day excursion). [Excursions: Week 2 Thursday (all day); Week 3 Wednesday 10am to Friday 1.00pm; Weeks 4, 6,10,11,12,13 Thursday (afternoon)]. **Prerequisite:** CROP 2001 or HORT 2001 or AGRO 2002. **Assessment:** One 3hr exam (60%), assignments (40%).

Emphasis is given to the scientific basis for fruit and winegrape production and to the sustainable production of vegetable crops. Concepts underlying the establishment and management of urban plantings are introduced. The unit develops skills in the evaluation of the technical and environmental status of established orchards, vineyards and vegetable crops.

Textbooks

P Baxter Growing Fruit in Australia (Macmillan Australia, 1997)

A Bradshaw, B Hunt and T Walmsley Trees in the Urban Landscape (Spon, 1995)

HORT 3002 **Flower and Nursery Crops 3**

4 credit points. Dr McConchie. **Semester:** 2. **Classes:** (2 lec, 2 prac)/wk [Excursions: Weeks 2,4Thursday (all day); Weeks 5,11 Thursday (afternoon)]. **Prerequisite:** CROP 2001 or HORT 2001 or AGRO 2002. **Assessment:** One 2 hr exam (60%), assignments (40%).

A discussion of the major aspects of the production of cut-flower and nursery crops, including protected cropping and glasshouse management. The unit will provide students with a detailed appreciation of the need for and methods of developing more precise production technology.

Reference book

K Handreck and N Black Growing Media for Ornamental Plants and Turf (NSW Univ Press), 1991

HORT 3003 **Postharvest Biology and Technology 3**

4 credit points. Dr R McConchie. Semester: 1. Classes: (1 Iec, 1 tut,& 2 prac)/wk. Prerequisite: CROP 2001 or HORT 2001 or AGRO 2002. Assessment: Assignments (40%), two 1 hr exams (60%).

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. Case study examples will be drawn from fruits, vegetables, cut flowers, nursery and foliage crops, turf and edible fungi. Students will study all operations from harvesting to consumer evaluation.

HORT 4001 **Horticultural Science 4A**
24 credit points. Semester: 1. Classes: Excursions: Wk 3 Friday pm, Wk 5 Saturday am. Prerequisite: HORT 3001.
A unit of study offering an advanced treatment of the scientific and technical basis of horticultural production and management. The research project and options selected must be approved by the Coordinator and by the Head of Department.

The unit will include:
Issues in Horticulture
(8 credit points)

Students attend a series of workshops, seminars and excursions designed to provide them with a broad overview of current issues affecting the horticultural industries. Assessment each semester will be by a one hour examination, plus an essay of 5000 words or a design and a report on a topic of their choice, selected from a list which covers the main efficiency, marketing and environmental issues affecting horticulture.
Scientific Basis of Horticultural Production and Management
(16 credit points)

An advanced series of lectures, practical classes and excursions on scientific aspects of horticultural production and management, with emphasis on environmental and marketing issues. The units covered will depend on which of the optional third year Horticultural Science units of study students have completed.
Research Project
(24 credit points)

Students carry out a research project under the close supervision of a member of the staff. Projects are likely to be in the areas of the production of fruit, vegetables or ornamentals, of postharvest biology or technology, or urban horticulture.In your project you will be expected to define a testable hypothesis, to test that hypothesis, and to bring your results and conclusions together in a clear, logically written thesis. Students with a sufficiently strong academic record and who produce a meritorious thesis may be eligible for honours.

HORT 4002 **Horticultural Science 4B**
24 credit points. Semester: 2. Prerequisite: HORT 3001.
See HORT 4001 Horticultural Science 4A.

LWSC1001 **Land and Water Science 1A**
6 credit points. Assoc Prof Rose, Prof Burgess. Semester: 1. Prohibition: CROP 1001 and HORT 1001. Assessment: One 2 hr exam, assignments, weekly class practical tests.
This unit of study introduces the principles and practices of modern primary industries and examines the relationships between the plants, animals and natural resources that make up production systems. The concepts of environmental and economic sustainability of production systems will be introduced.

Topics covered include introduction to ecological systems, regional resources and primary industries, technology and ecosystem disturbance and plant identification.
Practical: Field practical sessions allow 'hands-on' experience with the tillage, sowing and harvesting equipment used in primary production in Australia and include visits to sites of relevance to the management of land and water resources.
Textbooks
V.Squires and P.Tow (eds) Dryland farming: a systems approach (Sydney University Press), 1992
SCARM (1998) Sustainable agriculture: assessing Australia's recent performance (CSIRO)

LWSC 1002 **Land and Water Science 1B**
6 credit points. Assoc Prof Rose, Dr Sharma, Dr Cook. Semester: 2. Corequisite: (LWSC 1001) Land and Water Science 1 A. Prohibition: CROP 1002 and HORT 1002. Assessment: One 2 hr exam, assignments, weekly class practical tests.
This unit of study develops the theme of environmental sustainbility of primary production and examines the physical principles that underpin production systems. It examines the broad ecological relationships between the plants, animals and natural resources used in production systems, and deals with some of the problems facing primary production in the future. In addition the static and dynamic forces involved in structures and equipment, the behaviour and properties of water in biological systems and the physical aspects of weather and the changing Australian climate will be discussed.

Topics covered include climatology, environmental physics, ecosystems management, global issues of ecological significance and plant identification.
Practical: Field practical sessions allow 'hands-on' experience with the tillage, sowing and harvesting equipment used in primary production in Australia and feature measurement of some aspects of the physical principles as applied to production systems including solar cells, the weather and vehicle safety.
Reference Books
V.Squires and P.Tow (eds) Dryland farming: a systems approach (Sydney University Press), 1992
SCARM (1998) Sustainable agriculture;assessing Australia's recent performance (CSIRO)
M.W. Denny Air and Water: The Biology and Physics of Life's Media (Princeton University Press), 1993

LWSC 2001 **Land and Water Science 2**
4 credit points. Dr Vervoort. Semester: 2. Classes: 1 lec/wk, and one week fieldtrip through the southern part of the Murray Darling Basin, in particular Lachlan and Murrumbidgee valleys during the last week of the July holidays. Prerequisite: LWSC 1001 and LWSC 1002. Assessment: Two practical exercises and an assignment during the field trip and computer analysis of the results back at University, and a 2 hr exam (50%).
This unit of study is aimed at giving the students an introduction into the different solutions to varying land degradation problems. In achieving this aim the students will examine different case studies which together will give them the tools to design a catchment management plan for a river valley. The final and assessed product of the course is a report by groups of three students. The reports should outline how the Land and Water issues surrounding a particular land use in the catchment (eg, Agriculture, Urban, Forestry) could be addressed using Integrated Catchment Management principles.

The unit will consist of two parts. The first part is a 6-day field trip through the Lachlan valley and Murrumbidgee irrigation district. The students will perform two practical exercises during the trip and gather information for the report and an assignment. The second part of the unit will consist of a series of lectures and tutorials which will help the students use the gathered information, deliver more background and assist the students in formulating a plan. A final report is due 8 weeks after the field trip.
Reference book
Heathcote, I.W. 1998. Integrated watershed management, principles and practices, John Wiley and Sons, New York.
Murray-Darling Basin Ministerial (MDBC) Council 1999, The Salinity Audit of the Murray-Darling Basin - a 100 year perspective 1999, MDBC, Canberra, ACT.

LWSC 3001 **Hydrology and Catchment Management 3**
4 credit points. Dr Vervoort. Semester: 1. Classes: (3 lec/1 tut)wk. Prerequisite: LWSC 2001 or GEOG 2302 or GEOG 2303. Assessment: Two computer exercises (20%), two quizzes (10%), one 2 hr exam (70%).
This unit of study is designed to give students a thorough background in quantitative hydrology and some aspects of catchment management. The concepts of each component of the hydrological cycle and its measurement will be discussed and the relationships to the other aspects of the cycle will be investigated. This means the students will be given the tools to investigate quantitative hydrological problems such as rainfall-runoff responses. Some discussion of groundwater hydrology will be also included. Concepts of catchment management will build on the knowledge gained in LWSC 2001. The unit will mainly concentrate on the surface hydrology aspects of catchment management and as such the management of non-point source pollution. In order to achieve this, the physics of erosion and transport of nutrients in overland flow will be discussed, and modelling approaches will be investigated.

A computer practical using runoff data from actual watersheds will be given to illustrate the theoretical concepts. A catchment management model will be used to investigate the impact of different aspects of land management on the runoff response and nutrient loads in a river. A one-day excursion will be given to give the students some hands-on experience with some hydrological measurement tools.
Textbooks
M.J.Kirkby, Hillslope Hydrology. (Wiley publishers, Chichester, NewYork) 1978

LWSC 3002 **Irrigation Technology 3**
4 credit points. Dr Sutton. Semester: 2. Classes: (3 lec & 3 lab)/wk for half a semester. Prerequisite: LWSC 1001 and LWSC 1002. Prohibition: HORT 2001 and CROP 3002 and CROP 3003. Assessment: One 2 hr exam (50%),)Practical exercises and a written assignment (50%).
Irrigation Technology explores the major methods of applying irrigation (flood, furrow, sprinkler and micro-irrigation) and

associated water management and delivery issues. The underlying processes in each method are examined in detail and the basis of current inefficiencies and future efficiencies is identified. Practical steps for achieving maximum efficiency from each method are developed.

Reference book

M.E. Jensen. Design and Operation of farm Irrigation Systems (ASAE 1980)

LWSC 3003 Efficient Crop Water Management Princ 3

4 credit points. Dr Sutton. **Semester:** 2. **Classes:** (3 lec & 3 lab)/wk for half a semester. **Prerequisite:** LWSC 1001 and LWSC 1002. **Prohibition:** HORT 2001 and CROP 3002 and CROP 3003. **Assessment:** One 2 hr exam (50%), Practical exercises and **a** written assignment (50%).

The unit examines the processes governing water movement through the water balance applied to a cropping system. Methods of measurement and modelling of key parameters and processes, as well as the entire system, are described and pursued in workshops. The scientific basis for improved management options is identified and practical implementation of these options is explored. The principles explored apply to both rainfed and irrigated agriculture. For the latter, the approach taken is to ensure maximum beneficial use of rainwater and minimum dependence on irrigation.

MATH 1001 Differential Calculus

3 credit points. Semester: 1, Summer. Classes: 2 lec & 1 tut/wk. Assumed knowledge: HSC Mathematics Extension 1. Prohibition: May not be counted with MATH 1011 or 1901 or 1906. Assessment: One 1.5 hour examination, assignments and quizzes.

MATH 1001 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.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks

As set out in the Junior Mathematics Handbook.

MATH 1002 Linear Algebra

3 credit points. **Semester:** 1, Summer. Classes: 2 lec & 1 tut/wk. **Assumed knowledge:** HSC Mathematics Extension **1**. **Prohibition:** May not be counted with MATH 1902 or 1012. **Assessment:** One **1**.5 hour examination, assignments and quizzes.

MATH 1002 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 matrices, determinants, eigenvalues and eigenvectors.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks

As set out in the Junior Mathematics Handbook

MATH 1003 Integral Calculus and Modelling

3 credit points. Semester: 2, Summer. Classes: 2 lec & 1 tut/wk. Assumed knowledge: HSC Mathematics Extension 2 or MATH 1001. Prohibition: May not be counted with MATH 1013 or 1903 or 1907. Assessment: One 1.5 hour examination, assignments and quizzes.

MATH 1003 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 forms 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.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks

As set out in the Junior Mathematics Handbook

MATH 1005 Statistics

3 credit points. **Semester:** 2, Summer. **Classes:** 2 lec & 1 tut/wk. **Assumed knowledge:** HSC Mathematics. **Prohibition:** May not be counted with MATH 1905 or 1015 or ECMT1010 or 1020 or STAT **1**021 or 1022. **Assessment:** One **1**.5 hour examination, assignments and quizzes.

MATH 1005 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.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks

As set out in the Junior Mathematics Handbook

■ Mathematics units in the Bachelor of Agricultural Economics

Units offered by the School of Mathematics and Statistics in the Faculty of Science are listed here. Refer to the Faculty of Science Handbook for unit descriptions.

- MATH 1011 Life Sciences Calculus, 3 cp
- MATH 1012 Life Sciences Algebra, 3 cp
- MATH 1013 Life Sciences Difference and Differential Equations, 3 cp
- MATH 1015 Life Sciences Statistics, 3 cp.

MICR 2013 Introductory Microbiology 2

4 credit points. Dr P New(Coordinator), Dr Carter, Mrs Dalins, Dr Duxbury, Prof. Reeves. **Semester:** 1. **Classes:** (2.4 lec,.2 tut, 1.4 prac)wk. **Prerequisite:** BIOL 1001 or BIOL 1201, LWSC 1002 or CROP 1002 or HORT 1002,12 credit points of First Year Chemistry. **Prohibition:** MICR 2003, MICR 2001. **Assessment:** one 2hr theory exam, one 2hr prac exam, pracs.

This unit of study aims to give students an understanding of the relevance of microorganisms to land and water science, as well as to introduce them to the main areas of microbiology. Lectures are essentially the same as for Introductory Microbiology (MICR 2001) in the Faculty of Science. Topics covered include history and scope of microbiology; methodology; comparison of major groups of microorganisms; detailed study of bacteria including structure, classification and identification; microbiology of the natural environment including the soil, water, nutrient cycling and nitrogen fixation.

MICR 2101 Agricultural Microbiology 2

6 credit points. Dr New(Coordinator),Dr Carter, Mrs Dalins, Dr Duxbury, Prof. Reeves. **Semester:** 1. **Classes:** (3 lec, 2 prac & 1 tut)/wk. **Prerequisite:** First year Biology, First year Chemistry or Chemistry 1 Advanced. **Assessment:** One 2hr theory exam, one 3hr prac exam, prac, 2 assignments.

This unit of study aims to give students an understanding of the relevance of microorganisms to agriculture, as well as to introduce them to the main areas of microbiology. Lectures are the same as for Introductory Microbiology (MICR 2001) in the Faculty of Science.

Topics covered include history and scope of microbiology; methodology; comparison of major groups of microorganisms; detailed study of bacteria including structure, classification and identification, growth and death; microbiology of the natural environment including the soil, nutrient cycling and nitrogen fixation.

Textbooks

L.M. Prescott et al. Microbiology (W.C. Brown, 1999)

MICR 3102 Agricultural Microbiology 3

8 credit points. Dr New(Coordinator), Dr Carter, Mrs Dalins, Dr Duxbury, Prof. Reeves. **Semester: 2. Classes:** (3 lec, 4 prac & 1 tut)/wk. **Prerequisite:** MICR 2101. **Assessment:** One 2hr theory exam, one 3hr prac exam, prac, 2 assignments.

This is a unit of study in molecular microbiology and applied microbiology for students wishing to gain more knowledge in microbiology or those wishing to specialise in Microbiology in Fourth Year.

Molecular microbiology of bacteria, including genetics, regulation and manipulation of the bacterial genome, prokaryote

structure, taxonomy and evolution; human and animal health and disease; food microbiology; industrial microbiology.

Textbooks

As for MICR 2101 Agricultural Microbiology 2

MICR 4101 **Agricultural Microbiology 4A**

24 credit points. Dr New (Coordinator). **Semester: 1**. **Classes:** (3 lec, 6 prac, 3 other activities)/wk. Prerequisite: MICR 3102. **Corequisite: MICR 41**02. **Assessment:** One 1.5 h & one 2 hr theory exam, prac, research project.

The coursework for this unit follows substantially the same syllabus as the senior unit of study for Science students, General and Medical Microbiology (MICR 3001). As well as lectures and practical classes there is a variety of other activities, including workshops on library searches and laboratory instrumentation, mini lectures on data handling and laboratory safety, poster presentations, skills testing and tutorials. The unit of study covers two general areas:

Medical Microbiology: medical bacteriology, virology and parasitic diseases, epidemiology.

General Microbiology: microbial growth and metabolism, microbial ecology, food microbiology.

In addition to the coursework, students undertake a research project which runs over both the March and July semesters and accounts for roughly half of the final mark.

MICR 4102 **Agricultural Microbiology 4B**

24 credit points. Dr New (Coordinator). **Semester: 2. Classes:** (3 lec, 6 prac, 3 other activities)/wk. **Prerequisite:** MICR 3102. **Corequisite: MICR 41**01. **Assessment:** One 1.5 hr & one 2 hr theory exams, prac, seminar, research project.

The coursework for this unit follows substantially the same syllabus as the senior unit of study for Science students, Molecular and Environmental Microbiology (MICR 3002). As well as lectures and practical classes there is a variety of other activities, including workshops, mini lectures, poster presentations, skills testing and tutorials. The unit of study covers two general areas:

Molecular Microbiology: aspects of bacterial structure and physiology, principles of molecular pathogenicity.

Environmental Microbiology: microbial ecology, plant microbiology.

In addition to the coursework, students undertake a research project which runs over both the March and July semesters and accounts for roughly half of the final mark.

■ Marketing in the Bachelor of Agricultural Economics

Units of study offered by the Discipline of Marketing in the Faculty of Economics and Business follow this entry.

MKTG 2001 **Marketing Principles**

8 credit points. **Semester:** 1. **Classes:** (1 lec & 1 tut)/wk. **Prerequisite:** ECON 1001, ECON 1002, ECMT1010 and ECMT1020. **Corequisite:** ACCT1001 or ACCT1003. **Assessment:**Two 2hr exams (or equivalent), assignments.

Marketing units of study commence in second year, but prerequisites must be completed in first year.

Introduction to the terminology and functions of marketing in modern business practice. Market forces and opportunities, with reference to the role of social, economic, political and global influences and trends. Macro (societal) and micro (individual and firm) implications of the market process and marketing decision-making.

MKTG 2002 **Consumer Behaviour**

8 credit points. **Semester: 2. Classes:** (1 lec & 1 tut)/wk. **Prerequisite:** MKTG 2001. **Corequisite:** MKTG 2003. **Assessment:** Two 2hr exams (or equivalent), assignments.

Introduction to and overview of economic, psychological and sociological bases of consumer behaviour as they relate to the purchase and consumption of goods and services. Marketing implications of consumer behaviour and the interaction of consumers and the marketing process of organisations.

MKTG 2003 **Marketing Research I**

8 credit points. **Semester: 2. Classes:** (1 lec & 1 tut)/wk. **Prerequisite:** MKTG 2001. **Corequisite:** MKTG 2002. **Assessment:** Two 2hr exams (or equivalent), assignments.

Introduction to marketing research and the marketing research industry. Basics of problem recognition, formulation, research design and reporting. Qualitative research methods. Survey design and data collection. Data entry and coding. Introduction to basic quantitative analysis. Research practicum.

MKTG 3001 **Marketing Research II**

8 credit points. Semester: 1, Summer. Classes: (1 lec & 1 tut)/wk. Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003. Assessment: Two 2hr exams (or equivalent), assignments.

Quantitative marketing research methods, including multivariate research methods and models. Analysis and interpretation of data, report preparation and presentation. Applications to market segmentation, targeting, positioning and demand forecasting. Advanced research methods and overview of current state-of-the-art marketing research. Research practicum.

MKTG 3002 **Marketing Communications**

8 credit points. Semester: 2. Classes: (1 lec & 1 tut)/wk. Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003 and MKTG 3001. Assessment: Two 2hr exams (or equivalent), assignments.

Introduction to and overview of current theory and practice in advertising in the main media (television, radio, print, outdoor, cinema), sales promotion, personal selling and the new media, such as the Internet. Course includes case studies and major research project.

MKTG 3003 **Retail and Services Marketing**

8 credit points. Semester: 1. Classes: (1 lec & 1 tut)/wk. Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003. Corequisite: MKTG 3001. Assessment: Two 2hr exams (or equivalent), assignments.

The role of marketing and the marketing function within retail and service organisations. Special marketing issues involved in these organisations. Course includes case study and research practicum.

MKTG 3004 **New Products Marketing**

8 credit points. Semester: 2. Classes: (1 lec & 1 tut)/wk. Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003 and MKTG 3001. Assessment: Two 2hr exams (or equivalent), assignments.

Development and marketing of new consumer and industrial products and the role of the marketing function in that process. Identification of potentially profitable target markets and demand estimation. Dynamics of new product introductions. Course includes case study and research practicum.

MKTG 3010 **Electronic marketing**

8 credit points. Semester: 2, Summer. Assumed knowledge: INFO 1000. Prerequisite: MKTG 2001. Assessment: One 3hr theory exam, one 3hr prac exam, 1 essay, quizzes, project.

This unit of study provides an overview of the concepts and processes specifically applicable to electronic marketing. The unit focuses on those aspects of marketing management that under e-marketing are differentiated from the more traditional marketing environment. The unit will provide understanding of why these elements differ, and determine how to use/implement/ execute them to fit e-trade environments. The fundamentals of marketing such as market analysis, strategy, and developing an appropriate marketing mix are relevant regardless of the domain. However, in an e-commerce setting, different tools and/or techniques may be more or less available and/or more appropriate to use than in a traditional channel setting. Thus, the unit focuses on how customers and consumer behaviour are different and differentially affected by marketing stimuli in an electronic setting. The primary areas of study include marketing research on the Internet, database marketing, segmentation and targeting in an interactive setting, how e-retailing differs from 'bricks and mortar' retailing, the importance of e-brand development, advertising and communication on the net and the processes and logistics associated with product delivery in an e-commerce setting. Students will be given the opportunity to apply their learning by using up-to-date technology and tools.

PPAT 3002 **Plant Disease 3**

4 credit points. Professor Burgess, Dr Summerell, Dr Park, DrWellings. Semester: 2. Classes: (2 lec & 2 prac)/wk. Prerequisite: CROP 2001, CROP 2002, GENE 2001. Assessment: One 0.5 hr theory exam, one 1 hr prac exam, assignment, 3 short written quizzes.

This unit of study provides an introduction to the common plant diseases which limit agricultural and horticultural production or their control. Topics include symptoms and recognition of diseases and disorders such as frost and diagnostic procedures as well as biology, epidemiology and control of the major pathogens, fungi, viruses bacteria and nematodes. An introduction to breeding for resistance and the application of molecular based technologies in plant disease studies will also be included.

Reference books

G.N. Agrios Plant Pathology 4th edn (Academic Press, 1997)

J.F. Brown and H.J.Ogle (eds) Plant Pathogens and Plant Diseases (Rockvale Publications, 1997)

J.G. Manners Principles of Plant Pathology 2nd edn (Cambridge University Press, 1993)

D. Persley (ed.) Diseases of Fruit Crops (DPI Publications, 1993)

D. Persley (ed.) Diseases of Vegetable Crops (DPI Publications, 1994)

PPAT 4001 **Plant Pathology 4A**

24 credit points. Professor Burgess, Dr Summerell, Dr Park, Dr Wellings and external specialists. Semester: 1. Prerequisite: PPAT 3002.

The plant pathology specialisation prepares students for careers in professional plant pathology and in extension in plant pathology and crop protection. It provides an excellent background for entry into research careers especially in the field of fungal plant pathology. Experience in the field and in diagnostic procedures, especially the application of molecular based diagnostics, provides a very appropriate background for diagnostic and extension type careers. Students are required to complete a relevant 24-unit research project (PPAT 4002) (Plant Pathology 4B) and take the following three core modules and one other relevant 6-credit point module or unit of study, approved by the program coordinator.

Soil Biology and Biodiversity

6 credit points.

An introduction to the diversity of organisms found in the soil, and the ecological principles governing their activities and interactions. Practical applications are illustrated with particular reference to soilborne plant diseases. Practical classes demonstrate important tecniques for working with soil organisms and soilborne diseases, and for controlling the soil environment, especially soil water, to manipulate biological activity. Topics covered include the nature of the soil biota; isolation, identification and quantification of soil organisms; pathogenic and mutualistic interactions between fungi and roots; mycorrhizae; the nature and control of soilborne plant diseases; effects of water potential and temperature on the activity and survival of soil fungi; temporal and spatial distribution of soil fungi and soilborne diseases; and the soil biology of conservation fanning.

Advanced Field and laboratory Studies

6 credit points.

This module is designed to provide experience in field studies on the diagnosis and control of plant disease and diagnostic procedures for all types of pathogens. It will include studies in modern approaches to fungal taxonomy and identification, including molecular techniques. It will also include an introduction to modern methods for breeding for resistance to pathogens. An introduction to scientific investigations and literature surveys including computer research techniques will also be included.

Physiology of Plant Disease

6 credit points.

A series of lectures, tutorials and practicals on the processes involved in the interaction between plant cells and parasitic fungi and bacteria. Includes an introduction to the genetic basis of host resistance and parasitic specialisation. Covers the physiology of infection, host responses, roles of enzymes and toxins in parasitism, defence mechanisms of plants and the physiological basis of specificity.

Research Project

24 credit points.

A research project will be carried out in an aspect of one of the above subjects.

Textbooks

L. Bos Introduction to Plant Virology (Longman, 1983))Dr Semmerell to advise

S. Issac Fungal-Plant Interactions (Chapman & Hall, 1992)

Reference books

R.I.B. Francki et al. Atlas of Plant Viruses vols 1 & 2 (CRC Press, 1985)

R.E.F. Matthews Plant Virology 3rd edn (Academic Press, 1991)

R.E.F. Matthews Fundamentals of Plant Virology (Academic Press, 1992)

PPAT 4002 **Plant Pathology 4B**

24 credit points. Prof Burgess. **Semester:** 2. **Prerequisite:** PPAT 3002.

See Plant Pathology 4A.

Textbooks

See Plant Pathology 4A

RSIS 3001 **Rural Spatial Information Systems 3**

4 credit points. Prof McBratney, Dr Odeh. **Semester: 1. Classes:** Easter break, four 8 hr days plus one 3 day field excursion. **Prerequisite:** SOIL 2003, BIOM 2001 or BIOM 2002. **Assessment:** One 2hr exam, seminar, report on excursion and lab work.

The lecture material will present two main themes. (1) Data sources and acquisition methods: existing maps and their digitisation, digital elevation models and global positioning system (GPS), single-, multi- and hyper- spectral, active and passive sensor systems at gamma-ray, visible, infra-red and radio frequencies. (2) Processing of spatial data. This will elucidate the following topics: conceptual models of spatial phenomena, spatial data in the computer, building and accessing an entity database and continuous fields, data analysis using entities and continuous fields, and errors and quality issues in spatial data The lectures will also review Spatial Information Systems software.

Laboratory exercises will focus on applications which include land-cover assessment, regional hydrology and soil erosion risk at the whole-farm, catchment and regional scales using the ARCVIEW and ARC INFO software.

The field excursion will comprise a visit to the field site (Arthursleigh) for ground truthing of an erosion-risk map. Two days will be spent in Canberra visiting government agencies supplying and using natural resource data - eg, Bureau of Rural Sciences, CSIRO Land & Water, AUSLIG and AGSO.

- The terms Spatial Information Systems (SIS) and Geographic Information Systems (GIS) are used interchangeably in the literature. The former is more generic and does not imply certain scales.

Textbooks

P.A. Burrough and R.A. McDonnell Principles of Geographical Information Systems 2nd edn (Oxford University Press, 1998)

SOIL 2003 **Soil Science 2**

6-credit points. Dr Cattle, Prof. McBratney, Dr Singh. **Semester:** 1. Classes: (3 iec & 3hr prac)/wk. Assessment: One 3hr theory exam, one 1 hr prac exam, quizzes and prac book.

This unit of study is concerned with the fundamental properties of soil, the factors of soil formation, and the processes that operate in the soil system. The components of the unit of study are: pedology; soil physics and soil chemistry. These components are synthesised by reference to common soil profiles. The study of soil in the field starts with field description and assessment of essential characteristics. The physics of water and gas movement, temperature, density, swelling and strength are considered. Soil chemistry includes properties of organic matter, cation exchange capacity, nitrogen, phosphorus, potassium and acidity. Common soil types of N.S.W, are studied in relation to their formation, properties and classification.

Reference books

N.C. Brady The Nature and Properties of Soils 10th edn (Macmillan, 1990)

K.O. Campbell and J.W. Bowyer (eds) The Scientific Basis of Modem Agriculture (Sydney U.P., 1988)

D.L. Rowell, Soil Science: Memods and Applications (Longman, 1994)

R.E. White Introduction to the Principles and Practice of Soil Science 3rd edn (Blackwells Scientific, 1997)

A. Wild (ed.) Russell's Soil Conditions and Plant Growth 1 lm edn (Wiley, 1988)

SOIL 3003 **Soil Science 3**

8 credit points. Dr Singh, Dr Cattle, Prof. McBratney. **Semester:** 2. Classes: (4 lec & 3hr prac)/wk; 5 days in the field in last or 2nd last week mid-year break. Prerequisite: SOIL 2003. **Assessment:** One 3hr exam, reports on field and lab work.

Lectures on classification of soil, soil survey, pedological processes, geomorphology and soil stratigraphy, aerial photography, geostatistics and their application to land evaluation for rural purposes, the forms of land degradation occurring in Australia, the management of the soil environment and processes and management conducive to sustainable soil husbandry.

Five days' field work in the last week of the mid-year break will take place at a country location and involves landscape description and the description, mapping and sampling of soil profiles for the purpose of assessing land-use capability and field variability of soil properties. The field-work component is a compulsory part of the unit of study.

Practical: Thirty-six hours of laboratory work involves routine physical, chemical and statistical analyses of samples taken in the field relevant to assessment of the land use potential and the quantification of the soil variability and soil degradation at the survey site.

Reference books

T.J. Marshall and J.W. Holmes Soil Physics 3rd edn (Cambridge U.P., 1996)
D. Dent and A. Young Soil Survey and Land Evaluation (Allen & Unwin, 1981)
FAO A Framework for Land Evaluation FAO Soil Bulletin No. 32 (FAO, 1976)
E.A. FitzPatrick Soils (Longman, 1980)
R.H. Gunn et al. Australian Soil and Land Survey Handbook: Guidelines for Conducting Surveys (Inkata, 1988)
R.P.C. Morgan Soil Erosion and Conservation (Longman, 1986)
A. Wild (ed.) Russell's Soil Conditions and Plant Growth 11th edn (Wiley, 1988)

SOIL 4002 Soil Science 4A

24 credit points. Prof McBratney. **Semester: 1. Prerequisite:** SOIL 3003. The soil science specialisation trains people for careers in professional soil science and extension. It provides an excellent background for entry into all aspects of soil science research ranging from physics through mineralogy and chemistry to pedology. Increasing emphasis is being given to aspects of soil sustainability and environmental soil science in order that graduates can meet the growing national demands in this area.

The prerequisite for this unit of study is Soil Science 3. Students are required to complete a relevant 24-unit research project and take the following four modules: Advanced Soil Chemistry, Advanced Field and Laboratory Soil Physics, Advanced Pedology, and either Research Methods and Communications Skills or An Introduction to Precision Agriculture.

Reference books

Division of Soils, CSIRO Soils: an Australian Viewpoint (CSIRO/Academic, 1983)
A. Wild (ed.) Russell's Soil Conditions and Plant Growth 11th edn (Longman, 1988)

Advanced Field and Laboratory Soil Physics

6 credit points. Coordinator: Prof. McBratney. Offered: March. Classes: (2 lec, 1 tut & 5hr prac)/7wk, 5 days in the field (prior to beginning of March). Assessment: one 3hr exam, field and prac reports, problem sets, essay.

The emphasis is to examine the quantitative aspects of soil physics particularly in relation to the transfer of energy, gas, water, solids and solutes in soil.

Lecture and lab topics include heat flow, gas movement, soil water energetics, saturated and unsaturated flow of soil water, infiltration, solute movement, water and wind erosion as well as the fundamentals of numerical computer modelling of soil physical processes.

Five days' field-work, in the week prior to the beginning of March Semester, involves field measurement of soil physical properties such as shear and tensile strength, electrical resistivity, hydraulic conductivity and infiltration rates and moisture content.

Reference books

G.S. Campbell Soil Physics with BASIC (Elsevier, 1985)
R.J. Hanks and G.L. Ashcroft Applied Soil Physics (Springer, 1980)
P. Koorevaar et al. Elements of Soil Physics (Elsevier, 1983)
T.J. Marshall and J.W. Holmes Soil Physics 2nd edn (Cambridge U.P., 1988)
J. Richter The Soil as a Reactor (Catena, Cremlingen, 1987)

Advanced Pedology

6 credit points. Coordinator: Dr Cattle. Offered: March. Classes: (3 lec, 1 tut & 8hr prac)/7 wks, 5 days in the field (prior to beginning of March). Assessment: one 3hr exam, prac reports, field trip report, student lecture.

This unit of study centres on a weathering study which traces the changes from a rock parent material up through the soil profile. The methods of study include particle-size analysis and extraction of a fine-sand fraction for optical identification and quantification of the mineral species present. Thin sections of the rock and profile are examined and the main features identified and quantified. The data from the sand analysis, micromorphological investigations and clay mineral assessments are used to provide an understanding of the pedogenesis of the particular soil. A field trip to study the variety of soil types in their environmental setting is made two weeks prior to the commencement of the March semester.

A detailed study, including exercises, is made of the USDA soil classification system, Soil Taxonomy and the World Reference Base for soil resources (WRB).

Reference books

G.W. Brindley and G. Brown (eds) Crystal Structure of Clay Minerals and their X-ray Identification (Mineralogical Society, London, 1980)
E A FitzPatrick Soils (Longman, 1980)
E A FitzPatrick Micromorphology of Soils (Chapman & Hall, 1984)
R F Isbell The Australian Soil Classification (CSIRO Publishing 1996).

Advanced Soil Chemistry

6 credit points. Coordinator: Dr Singh. Offered: March. Classes: (3 lec, 1 tut & 8hr prac)/6wk (1st half). Assessment: one 3hr exam, lab report, problem sets, essay.

Topics include clay mineralogy, cation exchange capacity and pH dependent charge, soil charge characteristics, soil chemical analyses and their interpretation, formation of acid soil-Al and Mn toxicities, chemistry and adsorption/desorption of K, P and S in soil, soil solution and speciation of ionic components, soil salinity, oxidation/reduction reactions in soil, chemistry of soil organic matter and nitrogen, soil enzymology and solute movement.

Reference books

S.A. Barber Soil Nutrient Bioavailability (Wiley, 1984)
N.J. Barrow Reactions with Variable Charge Soils (Martinus Nijhoff, Dordrecht, 1987)
D.J. Greenland and M.H.B. Hayes The Chemistry of Soil Constituents (Wiley, 1978)
A.D. Robson (ed.) Soil Acidity and Plant Growth (Academic, 1989)
G. Sposito The Chemistry of Soils (Oxford, 1989)

An Introduction to Precision Agriculture

Coordinator: Professor McBratney. Classes: 5 days in the field (at Easter), 5 days intensive course work (during mid-year break). Assessment: Exam, practical reports essay.

Precision Agriculture involves matching management practices with crop and soil requirements as they vary across a site. Fields are treated differentially, if required, unlike conventional management, this type of management is only possible because of the advent of new hardware and software technologies which allow accurate positioning, fine-scale soil and crop monitoring, data interpretation and variable-rate application of inputs.

This unit of study provides an introduction to Precision Agriculture. It will consider within-field positioning, yield monitoring and mapping, remote sensing, soil sensing, sampling of soil, yield and soil-map production, production of digital elevation models, interpolation and prediction techniques, crop growth models and response curves for decision-support and differential management.

Five days will be spent in the field, where the practical application of various technologies will be demonstrated and soil and crop data will be collected by remote sensing, soil sensing and sampling and yield monitoring. The data collected during this period will be used in practical exercises conducted during the 5 days of intensive course work and as the basis of a report.

Textbook

A.B. McBratney, B.M. Whelan, R.A. Viscarra Rossel, T.F.A. Bishop, B.C. Boydell, M.J. Pringle and T.M. Shatar Precision Agriculture: an Environmentally and Economically Sustainable Strategy (Australian Centre for Precision Agriculture, Sydney, 1997)

SOIL 4003 Soil Science 4B

24 credit points. Professor McBratney. Semester: 2. Prerequisite: SOIL 3003. Corequisite: SOIL 4002.

Research Project

See SOIL 4002 Soil Science 4A.

4 Postgraduate course requirements

The higher degrees in the Faculty of Agriculture are:

DAgrEc: Doctor of Agricultural Economics
DScAgr: Doctor of Science in Agriculture
PhD: Doctor of Philosophy
MAgrEc: Master of Agricultural Economics
MScAgr: Master of Science in Agriculture
MAgr: Master of Agriculture.
APEC MSDevel: Master of Sustainable Development

The regulations governing the award of these degrees are printed in the Calendar and in this Handbook. Prospective candidates should consult with the Head of the Department/School 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).

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 or a bachelor's degree with first or 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 mimmum period of candidature is two years for candidates holding a master's degree or equivalent, or three years in the case of candidates holding a bachelor's degree with first class or second class honours; the maximum period of candidature is normally four years. The first 12 months 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 including at least one day per week during each year of 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 in any case will not be less than three years; the maximum period of candidature is normally eight years.

■ Master of Agricultural Economics, Master of Science in Agriculture and Master of Agriculture

Graduates of the University of Sydney who have completed units of study acceptable to the Faculty of Agriculture 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.

■ Master of Agricultural Economics and Master of Science in Agriculture

Candidates engage in research culminating in a thesis for two to three years full-time or pro rata part-time. Some honours graduates (or equivalent) may be eligible for a minimum candidature of one year full-time. A candidate may be required to serve a period of probation for not more than one year and to complete such work during the period as may be prescribed.

■ Master of Agriculture

Candidates engage in units of advanced study in some branch of agriculture for one year full-time or pro rata part-time. Candidates proceed by coursework including a research project comprising between 15% and 40% of the year's work in the areas of study agricultural chemistry, agricultural entomology, agricultural genetics, agronomy, animal science, biometry, cereal chemistry, cereal science, horticultural science, microbiology, plant breeding, plant pathology, plant protection, soil conservation, soil contamination, soil science and turf management. For the degree in agricultural economics, a research project is an optional component. The first semester of candidature is normally on probation.

■ APEC Master of Sustainable Development

The APEC Master of Sustainable Development is an international education initiative endorsed by the Asia-Pacific Economic Cooperation forum (APEC). It is designed to enhance the professional capacities, technical skills and knowledge base of middle to senior level managers responsible for environmental management and policy development in the Asia-Pacific region. Established as coursework study and delivered through conjoint teaching arrangements, the program has the institutional support of the University of Malaya, the University of Queensland and the Asian Institute of Management (Philippines). The program aims to address the capacity building requirements for establishing environmentally sound economic development in the APEC region. With an emphasis on developing those human resource competencies that help generate greater cooperative processes and regional linkages, the program adopts an interdisciplinary approach to understanding the practicalities of sustainable development. It has been specially designed for intensive mode delivery. Candidates will also engage in research, field studies and networking activities that encourage greater collaboration between government agencies, research institutions and the business community throughout the Asia-Pacific region.

■ Diplomas

The following postgraduate diplomas are awarded by the Faculty of Agriculture:

GradDipAgrEc: Graduate Diploma in Agricultural Economics
GradDipAgrSc: Graduate Diploma in Agricultural Science.

The Graduate Diploma in Agricultural Science shall be awarded in the following subject areas and the testamur for the diploma shall specify the subject area: agricultural chemistry; agricultural entomology; agricultural genetics; agronomy; animal science; biometry; horticultural science; microbiology; plant pathology; plant protection, soil science and turf management.

Graduates of the University of Sydney who have completed units of study acceptable to the Faculty of Agriculture 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 a diploma.

Candidates engage in units of advanced study in some branch of agriculture, for one year full-time or pro rata part-time. Candidates proceed by coursework including a research project comprising between 15% and 50% of the year's work except that in agricultural economics a research project is an optional component of the coursework required. The first semester of candidature is normally on probation.

Table of units of advanced study MAgr (Agricultural Science subject areas) and GradDipAgrSc

Unit code	Unit name	Credit points	Notes
Units with the same name but different unit values are mutually exclusive. A Research Project is compulsory in most disciplines.			
Agricultural Chemistry			
AGCH5001	Chemistry and Biochemistry of Biological Macromolecules A	8	
AGCH5002	Chemistry and Biochemistry of Biological Macromolecules B	8	
AGCH 5003	Chemistry and Biochemistry of Biological Macromolecules C	4	
AGCH 5004	Chemistry and Biochemistry of Biological Macromolecules D	4	
AGCH 5005	Methods of Analysis of Agricultural and Food Products and the Environ. A	8	
AGCH 5006	Methods of Analysis of Agricultural and Food Products and the Environ. B	8	
AGCH 5007	Methods of Analysis of Agricultural and Food Products and the Environ. C	4	
AGCH 5008	Methods of Analysis of Agricultural and Food Products and the Environ. D	4	
AGCH 5009	Cereal Chemistry A	8	
AGCH 5010	Cereal Chemistry B	8	
AGCH 5011	Cereal Chemistry C	4	
AGCH 5012	Cereal Chemistry D	4	
AGCH 5013	Research Methods in Agricultural and Biological Chemistry	8	*Compulsory*
AGCH 5025	Research Project Bl (Agricultural Chemistry)	12	
AGCH 5026	Research Project B2(Agricultural Chemistry)	12	
AGCH 5027	Research Project Al (Agricultural Chemistry)	8	
AGCH 5028	Research Project A2 (Agricultural Chemistry)	8	
Other units approved by the Head of Department up to 8 credit points			
Cereal Chemistry MAgr only			
As for Agricultural Chemistry except Cereal ChemistryA&B		8/8	*Compulsory*
AGCH 5029	Research Project Bl (Cereal Chemistry)	12	
AGCH 5030	Research Project B2(Cereal Chemistry)	12	
AGCH 5031	Research Project Al(Cereal Chemistry)	8	
AGCH 5032	Research Project A2(Cereal Chemistry)	8	
Cereal Science MAgr only			
AGCH 5014	Chemistry & Biochemistry of Grains A	8	
AGCH 5015	Chemistry & Biochemistry of Grains B	8	
AGCH 5023	Current Issues in Cereal Science Al	4	
AGCH 5024	Current Issues in Cereal Science A2	4	
AGCH 5033	Research Project (Cereal Chemistry)	12	
AGCH 5034	Research Project (Cereal Chemistry)	12	
AGCH 5035	Research Methods and Communication Skills	4	
AGCH 5036	Research Methods and Communication Skills	4	
Other units approved by the Head of Department up to 8 credit points			
Agricultural Entomology			
ENTO5002	Special Topics in Entomology	8	
ENTO 5003	Taxonomy and Biogeography of Insects	8	*Compulsory*
ENTO5004	Insect Ecology (Advanced)	8	
ENTO 5005	Insect Collection	4	
ENTO 5006	Research Methods in Entomology Al	8	*Compulsory*
ENTO 5007	Research Methods in Entomology A2	8	*Compulsory*
Other units approved by the Head of Department up to 16 credit points			

Table of units of advanced study MAgr (Agricultural Science subject areas) and GradDipAgrSc (cont.)

Unit code	Unit name	Credit points	Notes
Agricultural Genetics			
GENE 5001	Biotechnology	4	
GENE 5003	Cytogenetics and Genetic Manipulation	4	
GENE 5007	Introductory Plant Breeding	4	
GENE 5012	Research Project (Agricultural Genetics) A1	8	*Compulsory*
GENE 5013	Research Project (Agricultural Genetics) A2	8	*Compulsory*
ANSC5011	Livestock Genetics	4	
BIOL 3103	Molecular Genetics	12	
Other units approved by the Head of Department up to 24 credit points			
Agronomy			
AGRO 5001	Advanced Crop Agronomy	8	
AGRO 5002	Advanced Pasture Agronomy	8	
AGRO 5003	Crop Physiology (Advanced)	6	*Compulsory*
AGRO 5004	Plant Nutrition (Advanced)	4	
AGRO 5005	Readings in Plant Nutrition	2	
AGRO 5006	Research Project (Agronomy)	24	
AGRO 5007	Research Project A (Agronomy)	16	
AGRO 5008	Research Project B (Agronomy)	8	
AGRO 5009	Research Project CI (Agronomy)	12	
AGRO 5010	Research Project C2 (Agronomy)	12	
AGRO 5011	Research Project Al (Agronomy)	8	
AGRO 5012	Research Project A2 (Agronomy)	8	
AGRO 5013	Research Project Bl (Agronomy)	4	
AGRO 5014	Research Project B2 (Agronomy)	4	
Other units approved by the Head of Department up to 24 credit points			
Animal Science			
ANSC 5002	Animal Genetics (Advanced)	8	
ANSC 5004	Poultry Production (Advanced)	8	
ANSC 5009	Animal Health (Advanced)	8	
ANSC 5010	Pig Production (Advanced)	8	
ANSC 5012	Animal Biotechnology (Advanced)	8	
ANSC 5013	Research Project Al	8	
ANSC 5014	Research Project A2	8	
ANSC 5015	Special Topics in Animal Science	8	
ANSC 5016	Research Project A3	8	
Other units approved by the Head of Department up to 8 credit points			
Biometry			
BIOM5001	Advanced Biometry	8	
BIOM 5002	Applied Multivariate Analysis	8	
BIOM 5004	Designing Experiments in Agriculture	8	
BIOM 5005	Statistical Modelling in Agriculture	8	
BIOM 5008	Research Project (Biometry) A2	8	
BIOM 5009	Research Project (Biometry) B1	4	
BIOM 5010	Research Project (Biometry) B2	4	
Other units approved by the Head of Department up to 24 credit points			
Horticultural Science			
HORT 5006	Special Topics in Horticultural Science (Advanced)	4	
HORT 5010	Urban Horticulture (Advanced)	4	
HORT 5011	Research Project (Horticultural Science)	24	
HORT 5012	Flower and Nursery Crops (Advanced)	4	
HORT 5015	Postharvest Biology and Technology (Advanced)	4	
HORT 5016	Issues in Horticultural Science A	4	
HORT 5017	Issues in Horticultural Science B	4	
HORT 5018	Research Project 1 (Horticultural Science)	12	
HORT 5019	Research Project 2 (Horticultural Science)	12	
HORT 5020	Research Project 3 (Horticultural Science)	6	
Other units approved by the Head of Department up to 18 credit points			
Microbiology			
MICR 5001	Microbiology A (Advanced)	12	*Compulsory*
MICR 5002	Microbiology B (Advanced)	12	*Compulsory*
MICR 5005	Research Project (Microbiology) Al	8	
MICR 5006	Research Project (Microbiology) A2	8	
MICR 5007	Research Project B1 (Microbiology)	12	
MICR 5008	Research Project B2(Microbiology)	12	

Table of units of advanced study MAgr (Agricultural Science subject areas) and GradDipAgrSc (cont.)

Unit code	Unit name	Credit points	Notes
MICR 5009	Special Aspects of Microbiology A1	4	
MICR 5010	Special Aspects of Microbiology A2	4	
Plant Breeding			
GENE 5001	Biotechnology	4	
GENE 5002	Breeding for the Environment	4	
GENE 5003	Cytogenetics and Genetic Manipulation	4	
GENE 5004	Germplasm Management	4	
GENE 5005	Plant Breeding A	8	*Compulsory*
GENE 5006	Plant Breeding B	4	
GENE 5007	Introductory Plant Breeding	4	
GENE 5008	Quantitative Genetics	4	
GENE 5011	Research Project Additional	4	
GENE 5014	Research Project (Plant Breeding) A1	8	*Compulsory*
GENE 5015	Research Project (Plant Breeding) A2	8	*Compulsory*
Other units approved by the Head of Department up to 20 credit points			
Plant Pathology			
PPAT 5002	Defence Mechanisms of Plants	6	
PPAT 5004	Research Methods in Plant Pathology A	16	*Compulsory for GradDip AgrSc*
PPAT 5005	Soil Biology and Biodiversity	6	
PPAT 5006	Special Topics in Plant Pathology	8	
PPAT 5012	Research Methods in Plant Pathology B1	6	*Compulsory forMAgr*
PPAT 5013	Research Methods in Plant Pathology B2	6	*Compulsory for MAgr*
CROP 5006	Crop Protection (Advanced)	4	
PPAT 5014	Advanced Field and Lab Studies in Plant Disease	6	
Other units approved by the Head of Department up to 16 credit points			
Plant Protection			
PPAT 5002	Defence Mechanisms of Plants	6	
PPAT 5003	Taxonomy and Biogeography of Insects	8	*Compulsory*
PPAT 5005	Soil Biology and Biodiversity	6	
PPAT 5006	Special Topics in Plant Pathology	8	
PPAT 5010	Plant Protection Research Methods A1	8	*Compulsory*
PPAT 5011	Plant Protection Research Methods A2	8	*Compulsory*
CROP 5006	Crop Protection (Advanced)	4	
ENTO 5002	Special Topics in Entomology	8	
ENTO 5004	Insect Ecology (Advanced)	8	
Other units approved by the Head of Department up to 16 credit points			
Soil Conservation			
SOIL 5001	Advanced Methods of Studying and Analysing Soil	6	
SOIL 5003	Chemistry of the Soil Environment	6	
SOIL 5004	Formation, Evaluation and Management of the Soil Resource	8	*Compulsory*
SOIL 5005	Physical Modelling of the Soil Environment	6	
SOIL 5007	Soil Mineralogy, Pedogenesis and Taxonomy	6	
SOIL 5008*	Soil Properties and Processes	8	*Compulsory*
SOIL 5009	Strategies for Soil Conservation	10	*Compulsory*
SOIL 5010	Research Project A (Soils)	8	*Compulsory*
AGEC5010	Natural Resource Economics (Advanced)	8	*Compulsory*
Other units approved by the Head of Department up to 16 credit points			
Soil Contamination			
SOIL 5001	Advanced Methods of Studying and Analysing Soil	6	
SOIL 5003	Chemistry of the Soil Environment	6	
SOIL 5004	Formation, Evaluation and Management of the Soil Resource	8	
SOIL 5005	Physical Modelling of the Soil Environment	6	
SOIL 5006	Soil Contamination	10	*Compulsory*
SOIL 5008*	Soil Properties and Processes	8	*Compulsory*
SOIL 5011	Research Project (Soils)	16	*Compulsory*
BIOM 5001	Advanced Biometry	8	
Other units approved by the Head of Department up to 12 credit points			
Soil Science			
SOIL 5001	Advanced Methods of Studying and Analysing Soil	6	
SOIL 5002	Advanced Pedology	6	
SOIL 5003	Chemistry of the Soil Environment	6	
SOIL 5004	Formation, Evaluation and Management of the Soil Resource	8	
SOIL 5005	Physical Modelling of the Soil Environment	6	
SOIL 5007	Soil Mineralogy, Pedogenesis and Taxonomy	6	
SOIL 5008	Soil Properties and Processes	8	
SOIL 5010	Research Project A (Soils)	8	
SOIL 5011	Research Project (Soils)	16	
SOIL 5012	Research Project A1(Soils)	8	
Other units approved by the Head of Department up to 24 credit points			
Turf Management			
CROP 5001	Turf Management	6	*Compulsory*
CROP 5002	Advanced Turf Management	8	*Compulsory*
CROP 5003	Turf Species and Varieties	4	*Compulsory*
CROP 5004	Applied Plant Ecology	4	*Compulsory*
CROP 5010	Turf Nutrition	4	*Compulsory*
CROP 5011	Research Project 1 (Turf)	10	*Compulsory*
CROP 5012	Research Project 2 (Turf)	10	*Compulsory*
CROP 5013	Research Project A1 (Turf)	6	*Compulsory*
CROP 5014	Research Project A2 (Turf)	6	*Compulsory*
AGEC 5020	Business Topics in Turf Management	4	*Compulsory alternate years*
BIOM 5003	Data Management	4	*Compulsory*
CROP 5005*	Irrigation Science	4	
CROP 5009	Diagnostic Methods in Turf Management	2	
PPAT 5005*	Soil Biology and Biodiversity	6	
SOIL 5008*	Soil.Properties and Processes	8	
Other units approved by the Head of Department up to 8 credit points			
Note: MAgr 48 credit points total; GradDipAgrSc 48 credit points total			

* Available subject to background knowledge and availability of facilities.

Table of units of advanced study MAgr (Agricultural Economics) and GradDipAgrEc

Unit code	Unit name	Credit points	
AGEC 5001	Research Project A	16	*Mutually exclusive*
AGEC 5002	Research Project B	8	*Mutually exclusive*
AGEC 5003	Agribusiness Management (Advanced)	8	
AGEC 5004	Agricultural and Resource Policy (Advanced)	8	
AGEC 5005	Applied Commodity Modelling (Advanced)	8	
AGEC 5006	Applied International Trade (Advanced)	8	
AGEC 5007	Applied Marketing (Advanced)	8	
AGEC 5008	Commodity Price Analysis (Advanced)	8	
AGEC 5009	Contemporary Issues in Agricultural Economics	4	
AGEC 5010	Natural Resource Economics (Advanced)	8	
AGEC 5011	Production Economics (Advanced)	8	
AGEC 5012	Quantitative Business Management and Finance (Advanced)	8	
AGEC 5014	Exploitation and Conservation of Natural Resources	8	*MAgr only*
AGEC 5015	Applied Commodity Modelling PG (Advanced)	4	
AGEC 5016	Research Methods (Advanced)	4	
AGEC 5017	Research Project Bl	8	
AGEC 5018	Research Project CI	4	
AGEC 5019	Research Project C2	4	
AGEC 5023	Special Topics in Agricultural and Resource Economics (Advanced)	8	*MAgr only*
ECMT 3020	Applied Econometrics	8	*MAgr only*
ECMT 5002	Econometric Applications	8	
ECMT 5001	Econometric Theory	8	
ECMT 6901	Econometric Modelling	8	*MAgr only*
ECON	Economics (Level 3 unit)	8	*MAgr only*

Table of units of advanced study MAgr (Agricultural Economics) and GradDipAgrEc

Unit code	Unit name	Credit points	
ECON 3030	Forecasting for Economics and Business	8	*MAgr only*
ECON5002	Macroeconomics Theory	8	
ECON 6002	Macroeconomics Analysis	8	
ECON 5001	Microeconomics Theory	8	
ECON 6001	Microeconomics Analysis	8	
ECON 6003	Mathematical Methods of Economic Analysis	8	*MAgr only*
Other units ajpproved by the Head of Department up lto 16 credit points			
Note: MAgr 48 credit points total; GradDipAgrEc 48 credit points total.			

Table of units of advanced study APEC MSDevel

Unit code	Unit name	Credit points
APEC 5001	Economics of Sustainable Resource Use	4
APEC 5002	Environmental Decision Making	4
APEC 5003	Environmental Law and Policy	4
APEC 5004	Research Project (Field Study and Thesis)	20
APEC 5101	Environmental Management Systems and Auditing	4
APEC 5102	Theory and Practice of Sustainable Development	4
APEC 5201	Land Use Management and Conservation	4
APEC 5202	Urban Environmental Management	4
Note: APECMSDevel 48 credit points total.		

5 Units of advanced study

■ Agricultural Chemistry and Cereal Chemistry

AGCH 5001 **Chem & Biochem of Biol Macromolecules A**
8 credit points. **Semester:** 1.
See AGCH 5004

AGCH 5002 **Chem & Biochem of Biol Macromolecules B**
8 credit points. **Semester:** 2.
See AGCH 5004

AGCH 5003 **Chem & Biochem of Biol Macromolecules C**
4 credit points. **Semester: 1**.
See AGCH 5004

AGCH 5004 **Chem & Biochem of Biol Macromolecules D**
4 credit points. **Semester:** 2.
Lectures and laboratory classes including material on the physical behaviour of natural macromolecules and the structure and function of polysaccharides, proteins and nucleic acids. The 8 credit point units will include additional material on the mechanism of enzyme action, the chemistry and biochemistry of nucleic acids and gene expression, and the regulation of metabolism.

AGCH 5005 **Meth of Analysis of Agr and Food Prods A**
8 credit points. **Semester:** 1.
See AGCH 5008

AGCH 5006 **Meth of Analysis of Agr and Food Prods B**
8 credit points. **Semester:** 2.
See AGCH 5008

AGCH 5007 **Meth of Analysis of Agr and Food Prods C**
4 credit points. **Semester:** 1.
See AGCH 5008

AGCH 5008 **Meth of Analysis of Agr and Food Prods D**
4 credit points. **Semester: 2. Classes:** July.
These units(AGCH 5005,5006,5007,5008) teach the theory and practice of advanced analytical techniques for measuring the quality of agricultural products and the environment. They consist of laboratory analyses of the compounds in food that are important in nutrition, as well as procedures for assessing the quality of food, soil and water with respect to residues of agricultural chemicals. Exercises using computer simulation will be included to model processes of environmental chemistry and the factors affecting the persistence of some compounds.

AGCH 5009 **Cereal Chemistry A**
8 credit points. **Semester:** 1.
See AGCH 5012

AGCH 5010 **Cereal Chemistry B**
8 credit points. **Semester:** 2.
See AGCH 5012

AGCH 5011 **Cereal Chemistry C**
4 credit points. **Semester: 1.**
SeeAGCH5012

AGCH 5012 **Cereal Chemistry D**
4 credit points. Semester: 2.
Lectures and practical classes on the uses of various cereal, legume and oil-containing seeds including descriptions of the chemical structures, location, properties, isolation and analysis of commercially significant components such as proteins, polysaccharides and lipids as well as harmful substances, such as enzyme inhibitors, alkaloids, mycotoxins.

AGCH 5013 **Research Methods in Ag & Bio Chemistry**
8 credit points. **Semester: 1**.
This unit deals with recent developments in experimental techniques and analytical methods in agricultural and biological chemistry. Candidates prepare discussion papers and short essays (of approximately 1000 words) on topics of their choice, selected from a reading list which covers a wide range of basic and applied areas of biological chemistry.

AGCH 5025 **Research Project B1 (Agricultural Chem)**
12 credit points. **Semester: 1, 2. Classes: February. Corequisite:** AGCH 5026.
Candidates either undertake a program of extended laboratory experiments in biological chemistry and analyses of food and agricultural products or they elect to carry out a short research project in close association with a member of the academic staff. Projects are usually available in one of the following areas of research interest within the Department of Agricultural Chemistry and Soil Science: carbohydrate and nitrogen metabolism in a variety of crop plants; symbiotic nitrogen fixation; biochemistry of herbicides and pesticides; nutritional aspects of seed proteins; organic and inorganic residues in agricultural products.

AGCH 5026 **Research Project B2 (Agricultural Chem)**
12 credit points. **Semester: 1,2. Classes:** July. **Corequisite:** AGCH 5025.
See AGCH 5025

AGCH 5027 **Research Project A1 (Agricultural Chem)**
8 credit points. **Semester: 1, 2. Classes:** February. **Corequisite:** AGCH 5028.
See AGCH 5025

AGCH 5028 **Research Project A2 (Agricultural Chem)**
8 credit points. **Semester: 1,2. Classes:** July. **Corequisite:** AGCH 5027.
See AGCH 5025

AGCH 5029 **Research Project B1 (Cereal Chemistry)**
12 credit points. **Semester: 1. Classes:** February. **Corequisite:** AGCH 5030.
See AGCH 5025

AGCH 5030 **Research Project B2 (Cereal Chemistry)**
12 credit points. **Semester: 2. Classes:** July. **Corequisite:** AGCH 5029.
See AGCH 5025

AGCH 5031 **Research Project A1 (Cereal Chemistry)**
8 credit points. Semester: 1. Corequisite: AGCH 5032.
Candidates either undertake a program of extended laboratory experiments in biological chemistry and analyses of food and agricultural products or they elect to carry out a short research project in close association with a member of the academic staff. Projects are usually available in one of the following areas of research interest within the Department of Agricultural Chemistry and Soil Science: carbohydrate and nitrogen metabolism in a variety of crop plants; symbiotic nitrogen fixation; biochemistry of herbicides and pesticides; nutritional aspects of seed proteins; organic and inorganic residues in agricultural products.

AGCH 5032 **Research Project A2 (Cereal Chemistry)**
8 credit points. **Semester: 2. Corequisite:** AGCH 5031.
See AGCH 5031

■ Cereal Science

To enable employees in the cereal industries to upgrade their knowledge of cereal constituents and enhance their analytical, problem-solving and communication skills.

AGCH 5014 **Chemistry and Biochemistry Grains A**
8 credit points. Department of Agricultural Chemistry and Soil Science. **Semester:** 1,2. **Assessment:** examination, assignment, reports on lab work.

Material covered in this unit will include some or all of reading program, intensive lecture program, regular lecture program and laboratory work. Areas covered will include the chemistry and biochemistry of carbohydrates, amino acids and proteins, and fatty acids and lipids in grains; the relationship of the chemical characteristics of these compounds and anti-nutritional and toxic compounds to end uses in foods, feeds and other processed products; and laboratory exercises including sample preparation, chemical and biochemical analysis using a range of chromatographic, electrophoretic, spectroscopic and enzymic methods.

AGCH 5015 **Chemistry and Biochemistry Grains B**
8 credit points. **Semester: 1, 2. Assessment:** one written assignment, reports on lab work.
See AGCH 5014

AGCH 5023 **Current Issues in Cereal Science A1**
4 credit points. Semester: 1. Classes: February. Assessment: symposium presentation, one review paper.
Students will participate with invited speakers in a symposium on topical issues in the grains industry. In addition to giving their oral presentation, students will prepare a review paper on one of the issues covered.

AGCH 5024 **Current Issues in Cereal Science A2**
4 credit points. **Semester: 2. Assessment:** See AGCH 5023.
See AGCH 5023

AGCH 5033 **Research Project (Cereal Science)**
12 credit points. Semester: 1. Corequisite: AGCH 5034.
Students will complete a short research project which may be undertaken in their place of employment if suitable facilities are available. Each student will be assigned an academic supervisor from the Department of Agricultural Chemistry and Soil Science who will visit the site where the work will be performed, and assist in the planning of the project, provide advice during the work, and supervise the preparation of oral and written reports. Students should discuss prospective projects with the Degree Coordinator as soon as possible after enrolment. The project would normally be completed within 2-3 years.

AGCH 5034 **Research Project (Cereal Science)**
12 credit points. **Semester: 2. Corequisite:** AGCH 5033.
See AGCH 5033

AGCH 5035 **Research Methods & Communication Skills**
4 credit points. Semester: 1. Classes: February. Corequisite: AGCH 5036. Assessment: essay, oral presentation.
Students will attend a 3-day workshop, or a series of 3 hour sessions on research methodology and oral and written scientific communication. Subsequently they will research the literature and prepare an essay of approximately 5000 words and a 20 minute oral presentation on separate topics of their choice selected from a list which covers basic and applied aspects of cereal science.

AGCH 5036 **Research Methods & Communication Skills**
4 credit points. **Semester: 2. Classes:** July. **Corequisite:** AGCH 5035. **Assessment:** See AGCH 5035.
See AGCH 5035

■ Agricultural Economics

AGEC 5001 **Research Project A (Ag Economics)**
16 credit points. Semester: 1,2. Assessment: Thesis.
In this unit of study, students develop skills in economic research by designing, undertaking and reporting on a research project. Students undertake research on an approved topic under the supervision of a member of staff and prepare a report of approximately 20,000 words in length.

AGEC 5002 **Research Project B (Ag Economics)**
8 credit points. **Semester: 1,2. Corequisite:** AGEC 5017. **Assessment:** Thesis.
In this unit of study, students develop skills in economic research by designing, undertaking and reporting on a research project. Students undertake research on an approved topic under the supervision of a member of staff and prepare a report of approximately 10,000 words in length.

AGEC 5003 **Agribusiness Management (Advanced)**
8 credit points. Semester: 1. Classes: (3 lec & 2 workshop)/wk.
The unit is designed to introduce the economic principles and techniques of business management as they apply to farm and agribusiness firms. The topics covered will include: management goals and objec-tives; 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 rural credit market.

An integrated set of workshops is used to provide practical experience in firm planning utilising budgeting, gross margins analysis, linear programming, simulation methods and other techniques of analysis.

AGEC 5004 **Agricultural & Resource Policy Advanced**
8 credit points. **Semester:** 2. **Classes:** (3 lec & 1 tut)/wk. **Assessment:** one 3hr exam, assignments.
The topics discussed include: basic theoretical 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; microeconomic 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.

AGEC 5005 **Applied Commodity Modelling (Advanced)**
8 credit points. Semester: 1. Classes: (3 lec & 1 tut/lab session)/wk. Assessment: one 1.5hr exam, one 1.5hr prac exam, assignments.
The application of methods of data analysis to the agricultural and resource sectors is the focus of this Unit. Topics covered will include: formulation and econometric estimation of production relationships; demand; supply; expectations models and simple simultaneous representations of commodity sectors; time series forecasting applied to commodity and futures markets; and a suitable selection from an introduction to dynamic multipliers, dynamic elasticities, and econometric simulation. Use will be made of a variety of data analysis and econometric computer packages. Emphasis will also be placed on electronic and graphical approaches to data analysis along with consideration of the limitations and problems of the particular techniques.

AGEC 5006 **Applied International Trade (Advanced)**
8 credit points. **Semester: 1**. **Classes:** (3 lec & **1** tut)/wk. Assessment: one 3hr exam, assignments.
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; trade policies of importing and exporting nations, including issues such as food aid and surplus disposal programs; economic integration and impacts on international commodity trade; international trade policy making, including GATT and WTO; the impact of exchange rates and other macroeconomic variables on international trade in commodities.

AGEC 5007 **Applied Marketing (Advanced)**
8 credit points. Semester: 2. Classes: (3 lec & 1 tut/excursion)/wk. Assessment: one 3hr exam, assignments.
This unit will provide an understanding of the operation and principles of marketing, with practical applications focused on the food and fibre markets. The main topics covered will include: firm-level marketing mix and marketing strategy decision making; marketing management and planning; market research and information; futures markets and other risk sharing devices. The unit will also address the organisation and trends of food and fibre marketing in Australia; food and fibre industrial marketing, including value-adding and power in the supply chain; market efficiency, and international marketing by agribusiness firms.

AGEC 5008 **Commodity Price Analysis (Advanced)**
8 credit points. Semester: 1. Classes: (3 lec & 1 tut)/wk. Assessment: one 3hr exam, classwork and assignments.
This unit is focussed on the analysis of prices, pricing mechanisms and the operations of markets for agricultural and resource commodities and products. Topics include technical vs fundamental analysis of prices; constructing price indexes; the theoretical foundation of consumer demand functions;

theoretical relationships and empirical evidence concerning demand elasticities; aggregate supply relationships under perfectly and imperfectly competitive markets; equilibrium price determination in competitive markets; pricing by oligopolies and monopolies; structure, conduct and performance in industry; formulating structural models of commodity markets; reduced form models; partial and total elasticities; marketing services and marketing margin relationships; modelling expectations and other aspects of market dynamics; impact and dynamic multipliers; spatial markets and spatial pricing; product characteristics and hedonic price relationships. Applied examples from domestic and international agricultural and resource industries will be used.

AGEC 5009 Contemporary Issues in Agr Economics Adv

4 credit points. **Semester: 1, 2. Classes:** (2 lec)/wk. **Assessment:** one 2 hr exam, assignments.

A seminar series designed to provide students with a broad overview of current issues affecting the agricultural and resource industries. Seminars will cover the appraisal of current Australian agricultural and resource industry policy and international issues affecting Australia's agricultural and resource industries.

AGEC 5010 Natural Resource Economics (Advanced)

8 credit points. **Semester: 2. Classes:** 3 lec & 1 tut/lab)wk. **Assessment:** one 3hr exam, assignments.

A unit in natural resource economics of relevance to agriculture and the resource industries. Issues discussed are: the environment as a source of environ-mental services; socially efficient resource allocation and Pareto welfare economics; market failure and characteristics of environmental services; benefit cost analysis of public projects, including the modification of environmental services; non-depletable resources and pollution; depletable resources; irreversibility; sustainability. Applications include land degradation, fisheries, forestry, land-use planning and greenhouse effect.

AGEC 5011 Production Economics (Advanced)

8 credit points. Semester: 2. Classes: (3 lec and 2 workshops)/wk. Assessment: one 1.5hrexam, one 1.5hrpracexam, assignments.

This unit has two components. The first focuses on the analysis of production based on neoclassical production functions. Topics include: graphical and mathematical representation of process level and aggregate production relationships; factor-product, factor-factor and product-product problems; optimal resource allocation in unconstrained and constrained situations; shadow prices of resources; factor demand and product supply equations, cost and profit functions; duality theory; economies of scale, size and scope; technical, allocative and economic efficiency and their assessment; time in production; modelling and measuring productivity and technical change. The second part focuses on linear activity analysis. Topics include basic input-output analysis and elements of linear programming. Graphical and mathematical representation of linear constrained optimization models; primal and dual solutions; post-optimality analysis; parametric programming.

AGEC 5012 Quant Business Management & Finance Adv

8 credit points. Semester: 1. Classes: (3 iec & 1 tut/lab session)/wk. Assessment: one 3hr exam, assignments.

The application of applied optimising methods to decision-making in the agricultural and resource sectors is the focus of this course. Topics covered include: an overview of the applications of optimising models; linear, quadratic and nonlinear programming; queueing theory; inventory models; replacement models; agricultural sector models; transport and location models; spatial equilibrium systems; input-output analysis and compatable general equilibrium models; and model validation and verification. Issues of financial analysis and control, financial relationships, investment, capital budgeting, risk management and risk in investment decision making will also be covered.

AGEC 5014 Exploit & Conservation Natural Resources

8 credit points. **Semester: 1, 2. Classes:** (1 tut/wk). **Assessment:** one 2hr exam, assignments, term paper.

Concepts of economic optimal use of natural resources over time. Efficiency and equity considerations. Dynamic modelling of biological populations including forestry, fisheries and predator-prey systems, and physical environmental models including the atmosphere and river systems. Mathematical methods including dynamic programming, optimal control theory and stochastic optimisation for determining optimal exploitation strategies of renewable and non-renewable natural resources. Competitive firm, monopolistic firm and industry models. Resource pricing.

Textbooks

J.M Conrad and C.W.Clark Natural Resource Economics: Notes and Problems (Cambridge Press 1987)

P.A. Neher Natural Resource Economics: Conservation and Exploitation (Cambridge Press 1990)

AGEC 5015 Applied Commodity Modelling (Advanced)

4 credit points. Semester: 1. Classes: (2 Iec & 1 tut/iab)/wk. Assessment: one 1 hr exam, 1 hr prac exam, assignments.

The unit focuses on the concepts and basic procedures of regression analysis and the application of these methods to the analysis of economic data in the agricultural and resource sectors. Review of concepts of estimation and hypothesis testing. Simple regression model. Estimation and testing under classical assumptions. Multiple regression models and ordinary least squares estimation and testing under classical assumptions. Dummy variables. Lag variables. Deterministic model mis-specification. Single vs simultaneous equation models. Uses and limitations of graphical data analysis. Common departures from classical assumptions, their implications for estimation and improved methods of estimation. Students will learn the concepts and methods and develop skills in formulating and estimating models.

Textbooks

R.S. Pindyck and D.L. Rubinfeld Econometric Models and Economic Forecasts (McGraw-Hill, 1997)

Reference

K. White et al SHAZAM User's Reference Manual (McGraw-Hill, 1997)

AGEC 5016 Research Methods (Advanced)

4 credit points. **Semester: 2. Classes:** (3 lec, 1 lab)wk for 5 weeks. **Assessment:** onel .5hr exam, assignments.

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 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 illutsrated with examples of research in theoretical economics, empirical discipline-advancing research, empirical exploratory research, and research using policy-evaluation modelling.

Textbooks

J.A. Sharp and K. Howard The Management of a Student Research Project 2nd edn (power Publishing, 1996)

P. Phelan and P. Reynolds Argument and Evidence (Routledge, 1996)

Reference books

G.L. Johnson Research Methodology for Economists: Philosophy and Practice (Macmillan, 1986)

C.A.Moser and G.Kalton Survey Methods in Social Investigation 2nd edn (Heinemann, 1971)

AGEC 5017 Research Project B1 (Ag Economics)

8 credit points. Semester: 1, 2. Corequisite: AGEC 5002.

In this unit of study, students develop skills in economic research by designing, undertaking and reporting on a research project. Students undertake research on an approved topic under the supervision of a member of staff and prepare a report of approximately 10,000 words in length.

AGEC 5018 Research Project C1 (Ag Economics)

4 credit points. Semester: 1. Corequisite: AGEC 5019.

In this unit of study, students develop skills in economic research by designing, undertaking and reporting on a research project. Students undertake research on an approved topic under the supervision of a member of staff and prepare a report of approximately 10,000 words in length.

AGEC 5019 Research Project C2 (Ag Economics)

4 credit points. Semester: 2. Corequisite: AGEC 5018.

See AGEC 5018 (Must do both 5018 and 5019).

AGEC 5023 Spec Topics Agr/Resource Economics (Adv)

8 credit points. **Semester: 1, 2. Assessment:** one exam, assignments and/or essays.

This unit deals with specialised areas of agricultural or resource economics of particular interest to approved students. Examples could include economics of agricultural transport, advanced production economics and agricultural household studies. The student will read under the guidance of staff and complete designated learning tasks.

■ Agronomy

AGRO 5001 **Advanced Crop Agronomy**
8 credit points. Dr Jacobs. **Semester: 1. Assessment:** one 3hr exam, review paper.
A field-based unit on crop management with particular reference to grain legume and fibre crops. Analyses will be in the context of (i) their ecology, underlying physiology and nutrition; (ii) their farming system, including technical and economic analysis of their management and their roles and restrictions within existing and imaginable farming systems; and (iii) their end uses, and how to better meet the technical needs of markets. Remote sensing and geographic information systems technology are used to monitor crop area and production, computer-based decision support systems to assist crop management, and professional diagnosis of hypothetical problems in crop production to develop analytical skills.

The unit involves two field trips. The first, of five days, begins in the first week of February Semester. This allows study of two crops. A second field trip is organised to research broader issues of management of traditional and alternative field-crop ecosystems identified by students.

AGRO 5002 **Advanced Pasture Agronomy**
8 credit points. Dr Jacobs. **Semester: 1. Assessment:** one 2hr exam, assignments.
Identification of management problems relating to pastures within farming systems; grassland measurement; improvement of farm performance; plant adaptation and management of plant competition. Principles of grassland ecology; taxonomy and identification of important grasses and legumes.

AGRO 5003 **Crop Physiology (Advanced)**
6 credit points. Dr Jacobs. **Semester: 1. Assessment:** one 2hr exam, assignments.
This unit examines the physiology of plants important in agriculture. The impact of environment and management on photosynthesis, respiration, water relations and plant development will be discussed in relation to the formation of grain or forage, and the quality of major crop and pasture species. The use of instrumentation to measure the physiological responses of plants to stress will be featured in practical sessions.

AGRO 5004 **Plant Nutrition (Advanced)**
4 credit points. Dr Campbell. **Semester: 1. Assessment:** one 3hr exam, assignments.
This course examines how plants acquire nutrients and distribute nutrients between organs during growth. Nutrient function, nutrient genotype interactions and diagnosis of nutrient deficiencies/toxicities are interrelated concepts. Other topics include: prediction of macronutrients and micronutrient requirements; legume nutrition; heavy metals; environmental considerations - eg, leaching of nitrate. Practical classes deal with diagnostic techniques.

AGRO 5005 **Readings in Plant Nutrition**
2 credit points. Dr Campbell. Semester: 1, 2. Assessment: essay.
The unit offers the student the opportunity to read extensively in an area of plant nutrition. Discussions are held to guide students in synthesising the knowledge gained in the chosen topic.

AGRO 5006 **Research Project (Agronomy)**
24 credit points. **Semester: 1,2.**
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5007 **Research Project A (Agronomy)**
16 credit points. **Semester:** 1, 2.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5008 **Research Project B (Agronomy)**
8 credit points. **Semester:** 1, 2.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5009 **Research Project C1 (Agronomy)**
12 credit points. Semester: 1. Corequisite: AGRO 5010.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5010 **Research Project C2 (Agronomy)**
12 credit points. Semester: 2. Corequisite: AGRO 5009.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5011 **Research Project A1 (Agronomy)**
8 credit points. Semester: 1. Corequisite: AGRO 5012.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 501**2** **Research Project A2 (Agronomy)**
8 credit points. Semester: 2. Corequisite: AGRO 5011.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5013 **Research Project B1 (Agronomy)**
4 credit points. Semester: 1. Corequisite: AGRO 5014.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

AGRO 5014 **Research Project B2 (Agronomy)**
4 credit points. Semester: 2. Corequisite: AGRO 5013.
Candidates will conduct and report on a well-defined investigation into an area of interest in agronomy.

■ Animal Science

ANSC 5002 **Animal Genetics (Advanced)**
8 credit points. Assoc. Prof. Nicholas, Assoc. Prof. Moran. Semester: 1. Classes: (3 lec & 1 prac)/wk. Assessment: one 3hr exam, assignments.
A series of lectures and practical classes providing a firm basis in population and quantitative genetics, leading to more advanced applications in animal breeding. Single-locus population genetics theory, including the theory of selection and random drift, precedes the exposition of quantitative theory, including partitioning of phenotypic and genetic variances and parameter estimation.

Selection indexes (both single trait and multi-trait) are dealt with extensively and BLUP (Best Linear Unbiased Prediction) is discussed. Practical classes are based on computer simulation or analysis of illustrative data. Excursions illustrate the applications of genetics in commercial and research settings.

ANSC 5004 **Poultry Production (Advanced)**
8 credit points. Semester: 1. Assessment: one 3hr exam.
Avian biology, with emphasis on the unique features of the digestion, absorption and utilisation of nutrients, and on the physiology of egg formation. Commercial production of broilers and table eggs, with consideration of environmental requirements, housing and disease control.

ANSC 5009 **Animal Health (Advanced)**
8 credit points. **Semester: 2. Classes:** (3 lec & 1 tut)/wk. **Assessment:** one 3hr exam.
Biology and immunology of host responses to infectious and parasitic diseases; definition of general disease states; examination of several livestock diseases of major economic significance; the development of livestock management programs which minimise the occurrence of or eradicate the above diseases; the use of commercial biological and chemical products to control animal health.

ANSC 5010 **Pig Production (Advanced)**
8 credit points. Semester: 2. Assessment: one 3hr exam, assignments.
A series of lectures and practical classes with emphasis on the efficiency of pig meat production. All aspects of the production cycle are covered including management of the breeding sow and growing pig. Environmental requirements, housing, feeding practices and disease control are considered. Application of computer-based models to commercial piggeries.

ANSC 5011 **Livestock** Genetics
4 credit points. Assoc. Prof. Nicholas, Assoc. Prof. Moran. Semester: 1. Lectures in livestock genetics with special emphasis on the genetic basis of animal disease.

ANSC 5012 **Animal Biotechnology (Advanced)**
8 credit points. Assoc. Prof. Moran, DrTaylor, Assoc. Prof. Nicholas, Dr Thomson. **Semester: 2. Classes:** (3lec & 1tut)/wk. **Assessment:** one 3hrexam, assignments.

A series of lectures, tutorials and supervised reading and computer aided instruction covering the application of biotechnology to animal productivity, disease control, the development of new products from domestic animals and the impact of micro-organism and plant biotechnology on animals. Included are molecular genetics, cell biology and recombinant DNA technology, in principle and application; the techniques and outcomes of genetic mapping and genomics in gene discovery; techniques and outcomes of transgenesis, including nuclear transfer, knockout mutagenesis and production of human pharmaceutical proteins; gene therapy for modulating tissue function and repair of inherited and acquired defects; production and use of recombinant proteins; bioinformatics, including techniques for storing, retrieving and analysing molecular and genomic information; intellectual property protection; risks and benefits; ethical implications of biotechnology.

ANSC **5013** **Research Project (Animal Science) A1**

8 credit points. **Semester: 1.**

Candidates will conduct and report on a well-defined investigation into an aspect of animal production.

ANSC 5014 **Research Project (Animal Science) A2**

8 credit points. **Semester:** 2.

See ANSC 5013

ANSC 5015 **Special Topics in Animal Science**

8 credit points. **Semester:** 1,2.

This unit deals with specialised areas of particular interest to each candidate.The unit of study may include tutorials, seminars, essays and directed reading on selected topics.

ANSC 5016 **Research Project (Animal Science) A3**

8 credit points. **Semester:** 1,2.

See ANSC 5013

■ APEC Master of Sustainable Development

APEC 5001 **Economics of Sustainable Resource Use**

4 credit points. Professor Gordon MacAulay, Department of Agricultural Economics, University of Sydney. Semester: 1, 2. Classes: (26 hrs lec & tut). Assessment: 2 hr exam, assignments.

This unit examines the economics of sustainable development and the use of resources. The course also aims to expose students to the economic theories and strategies underpinning the trade liberalisation and sustainable economic growth policies pursued by APEC. Areas covered in this unit include issues relating to the nexus between economic activity and the natural environment, non-depletable and depletable resources and the dynamics of market forces and their impact on the principles and practice of sustainable development. Other areas which may be covered include theories relating to the nature of economic development, the theories of supply and demand, price and decision theory, welfare theory, cost-benefit analysis, economics of land use, savings and investment, economic policies, labour markets, differing needs of developed and developing economies and policy mechanisms for sustainable resource use. Emphasis will be on the topics that help students develop a sound understanding of economics for decision-making.

Textbooks

Tietenberg, T. (1992), Environmental and Natural Resource Economics, Harper Collins.
Worster, D. (1994) Nature's Economy: A History of Ecological Ideas, 2nd edition, Cambridge University Press, Cambridge.
Common, M (1995) Sustainability and Policy: Limits to Economics, Cambridge University Press, Cambridge.
James, D. (ed) (1994) The Application of Economic Techniques in Environmental Impact Assessment, Kluwer, Dordrecht.
Morton, G.A. (1984) Resource Economics, Edward Arnold, London.
Goldin I. and L.A. Winters (1995), The Economics of Sustainable Development, Cambridge University Press, Cambridge.

APEC 5002 **Environmental Decision Making**

4 credit points. Professor Jim Petrie and Dr Cynthia Mitchell, Department of Chemical Engineering, University of Sydney. **Semester: 1,2. Classes: (26** hrs **of** lec and tut). **Assessment:** case study analyses and report writing.

The ability to make good environmental decisions is confounded by the range of issues which need to be considered, the wide range of stakeholders involved, and uncertainties in the information available to support the decision. The task of bringing all this together in a structured manner, ensuring the clear identification of decision objectives, and the criteria by which the value of possible decision outcomes will be assessed, poses both academic and practical questions, and is worthy of a course of study.

This course will consider, from a 'Systems' perspective, the practice of environmental decision making, the tools and approaches used in problem structuring and decision analysis, and the evaluation of decision outcomes. A specific focus will be where there are multiple objectives to be satisfied, including the exploration of trade-offs between environmental, economic, and social objectives. The course will explore the use of 'Life Cycle Thinking' to guide the scope of decision analysis, providing the spatial and temporal boundaries which define the decision space.

Case studies will come from Environmental Impact Assessment - both strategic and project-level, Life Cycle Assessment, and Risk Management.

Textbooks

Jackson, T (1996) 'Material Concerns - Pollution, Profit and Quality of Life', Routledge Press, London
Society for Environmental Toxicology and Chemistry (1993) 'A Conceptual Framework for Life Cycle Impact Assessment', SETAC Foundation for Environmental Education, U.S.A
Janssen, R (1994) 'Multi-Objective Decision Support for Environmental Management', Kluwer Academic Publishers, the Netherlands
Beinat, E (1997) 'Value Functions for Environmental Management', Kluwer Academic Publishers, the Netherlands
Ayres, R.U and L.W.Ayres (1996) 'Industrial Ecology-Towards Closing the Materials Cycle', Edward Elgar Press, England

APEC 5003 **Environmental Law and Policy**

4 credit points. Professor Ben Boer and colleagues, Law School, University of Sydney. Semester: 1,2. Classes: (26 hrs seminar). Assessment: Essay, in-class examination and class participation.

The aim of this unit is to introduce students to environmental law and policy in the Asia Pacific region, including Australia. The unit introduces students to the legal and institutional implications of adopting the concept of ecologically sustainable development (ESD), particularly for governments and corporations. It discusses the ethical implications of ESD, followed by an exploration of its implications for regulation and accountability in various fields, including land-use planning, pollution control, and natural and cultural heritage conservation. Decision-making mechanisms such as environmental impact assessment, the role of public participation, avenues of accountability in the administrative, civil and criminal sphere and forums such as environmental courts and tribunals are a focus. Emphasis is also given to the role of international and regional organisations in the development of environmental law in the region, including the Asia Pacific Economic Cooperation Forum, the United Nations Environment Program, the United Nations Development Program, the World Conservation Union, the Association of South East Asian Nations (ASEAN), the South Pacific Regional Environment Program and the South Asian Cooperative Environment Program.

Textbooks

Law School, University of Sydney, Environmental Law and Policy Readings (unpublished).
United Nations Environment Program (1997), UNEP Environmental Law Training Manual, United Nations Environment Program, Nairobi.
Boer, B; Ramsay, R; and Rothwell, DR (1988), International Environmental Law in the Asia Pacific, Kluwer Law International, Sydney.

APEC 5004 **Research Project**

20 credit points. Supervisor(s) from participating institutions. **Semester: 1,2. Assessment:** Development of a field study outline (plan) and 10,000 word minor thesis.

Students will be required to undertake a research project that will involve a study that combines issues and problems faced in their home economy and their impact on the sustainable development agenda of the Asia-Pacific region. The study will involve working in collaboration with the public and private sectors and will be based on theoretical and practical aspects of sustainable development. Students will need to produce a field study plan and conduct practical activities such as surveys, interviews and information gathering. The field study exercise will be conducted over a period of 4 months and lead to the production of a minor thesis. The University of Sydney will offer the research project and students will receive supervisory support from institutions participating in the program.

APEC 5101 **Environm'tal Manage't Systems & Auditing**

4 credit points. Mr Robert Pagan, University of Queensland. **Semester: 1,2. Classes: (26** hrs lec **& tut). Assessment:** Case study analysis and audit report writing.

This unit examines the theory and practice of developing an Environmental Management System (EMS) and the methods of conducting environmental audits. The EMS component of the subject is structured around international standards BS7750 and ISO 14000. The environmental auditing component is based on the need to comply with environmental duties and responsibilities that compromise a 'quality system'. Auditing is a technique for reviewing and maintaining that system and ensuring compliance with it. Case studies are used to illustrate 'best practice'.

APEC 5102 **Theory & Practice: Sustainable Develop't**

4 credit points. Professor Tor Hundloe.University of Queensland. **Semester: 1,2. Classes: (26** hrs lec **& tut). Assessment:** One research paper and class presentation.

This unit examines the inter-relationship between the disciplines of ecology, economics, social sciences and moral philosophy. It aims to familiarise students with the history of sustainable development and an understanding of how it differs from earlier concepts of environmental protection and management. The unit also aims to develop a sound theoretical basis of the integrating disciplines. Students will be exposed to the frameworks that allow for the integration of the disciplines that form the foundation for practical application of sustainable development. The unit will look at the theories of development, the ecological, economic and social/cultural conceptualisation of sustainability, the ideas of ethics, the practical tools for adopting the framework for sustainable development, the global, regional and local dimensions of sustainable development and, the management and policy responses.

Textbooks

World Commission on Environment and Development (1997) Our Common Future, Oxford University Press, Oxford.
Common, M (1995) Sustainability and Policy: Limits to Economics, Cambridge University Press, Cambridge.
Diesendorf, M. and Hamilton, C. (eds) (1997), Human Ecology, Human Economy, Allen & Unwin, Sydney.
Meadows, D.H., Meadows, D.L. & Randers, J. (1992) Beyond the Limits, Earthscan, London.
Worster, D. (1994), Nature's Economy: A History of Ecological Ideas, 2nd edition, Cambridge University Press, Cambridge.

APEC 5201 **Land Use Management and Conservation**

4 credit points. Dr Phang Siew Nooi, University Malaya. **Semester: 1, 2. Classes: (26** hrs lec **& tut). Assessment:** oral presentation, research paper, and seminar discussions.

This unit will look at the measures and arrangements for the conservation and enhancement of environmental quality in urban and rural areas. It will review the arrangements affecting the conservation and management of historic the natural and built environments. It will also consider the wider relevance of urban. conservation in the development of social and cultural values. The planning and management of recreation provision in urban and rural areas will also be included in the unit.

Textbooks

Graham, H. & Hunter, C. (1994) Sustainable Cities, Cromwell Press, London.
Ronan, P., Morey, J. &Lever, B., (eds) (1995) International Perspectives in Urban Studies, Athenaeum Press, London.

APEC 5202 **Urban Environmental Management**

4 credit points. Dr Phang Siew Nooi, University Malaya. **Semester: 1, 2. Classes: (26** hrs lec **& tut). Assessment:** oral presentation, report writing, forum discussions.

Urban centres, large and small, exist in all countries that are experiencing rapid rates of urbanisation. Urban centres are important conglomerates of essential and vital services and constitute the major administrative and commercial centres of their country. There are indications to show that the trend of urbanisation in these centres will continue and may cause a strain on the urban environment. The aim of this unit is to examine the urbanisation processes as they impact on the environment. The unit will also focus on the aspects of urban environmental management. Some of the issues that will come under examination include housing, slum and squatter settlements, traffic congestion, urban infrastructure and services, health, planning and management of urban projects, and enhancing revenue resources. The unit will be conducted through a series of forum and panel discussions, on-site visits and briefings on cases.

Textbooks

Ronan, P., Morey, J. & Lever, B., (eds) (1995) International Perspectives in Urban Studies, Athenaeum Press, London.
Jurgen, R., (ed) (1996) The Dynamics of Metropolitan Management in Southeast Asia, ISEAS, Singapore.
Harpham, T & Tanner, M., (eds) (1995) Urban Health in Developing Countries: Progress & Prospects, Earthscan Publication.

■ Biometry

BIOM 5001 **Advanced Biometry**

8 credit points. Prof. O'Neill. **Semester: 1. Assessment:** one 3hr exam, assignments.

This unit explores experimental design and analysis, using balanced and unbalanced data sets. Examples are taken from current experiments conducted in the Department or the Faculty. It also extends statistical theory to more difficult design problems. Topics here include bivariate distributions, maximum likelihood estimation, likelihood ratio tests.

BIOM 5002 **Applied Multivariate Analysis**

8 credit points. Dr Thomson. **Semester:** 2.

This unit develops methods for analysing several agronomic variables simultaneously, in designed experiments.

BIOM 5003 **Data Management**

4 credit points. Dr Thomson. Semester: 1.

This course explores methods for collecting, describing, and analysing biological data from turf management studies. It includes a discussion of biological variability and of simple statistical techniques available for comparing treatments. The course will allow students to understand the concepts of the commonly used statistical techniques they are likely to encounter in the industry.

Practical classes will involve extensive use of personal computers. There will be a general introduction to computers, file management, and standard Windows software. The package Excel will be used extensively for data organisation, plotting and simple analyses. The word processing package Word will also be used for report preparations. Consideration is also given to choice of statistical packages such as Minitab.

BIOM 5004 **Designing Experiments in Agriculture**

8 credit points. Assoc. Prof. O'Neill, Dr Thomson. Semester: 1. Assessment: one 2hr exam, assignments.

This unit looks at the principles and techniques underlying the modern statistical approach to designing experiments in agricultural research. Emphasis is placed on students learning how to advise experimenters on design problems, in consultation with Faculty members.

BIOM 5005 **Statistical Modelling in Agriculture**

8 credit points. Assoc. Prof. O'Neill, Dr Thomson. **Semester: 2. Assessment:** one 2hr exam, assignments.

This unit looks in depth at how statistical models can be of use in agricultural research. Topics covered include linear and non-linear models, time series methods, and spatial analyses of field experiments.

BIOM 5008 **Research Project (Biometry) A2**

8 credit points. **Semester: 1**, 2.

Candidates will conduct and report on a well-defined investigation into an area of interest in biometry.

BIOM 5009 **Research Project (Biometry) B1**

4 credit points. Semester: 1, 2. Classes: February or July.

Candidates will conduct and report on a well-defined investigation into an area of interest in biometry.

BIOM 5010 **Research Project (Biometry) B2**

4 credit points. **Semester: 1**,2. **Classes:** February or July. Corequisite: BIOM 5009.

Candidates will conduct and report on a well-defined investigation into an area of interest in biometry.

■Turf Management

AGEC 5020 **Business Topics inTurf Management**

4 credit points. Assoc. Prof. Drynan. Semester: 2. Assessment: one 2hr exam, assignments, class work, term paper.

This unit involves a minimum of 25 hours of formal lectures and practical classes with additional directed reading of relevance to particular student groups. The unit will focus on the management economics of organisations providing market-priced and non-priced services such as recreation. Topics may include market assessment and marketing strategies, pricing strategies, financial planning and control, and resource management.

CROP 5001 **Turf Management**
6 credit points. Dr Martin. Semester: 1. Classes: February. Assessment: one 3hr exam, assignments and prac exercises.
Lectures, workshops and field visits centred on the theme of 'turf: a self-contained system'. Students will address the scientific issues underlying the design, construction, grassing and maintenance of turf facilities: construction of desired soil profiles; structure, nutrition and drainage of soils under turf management; the micro- and macroenvironment of turf; water management and physiology of growth under turf conditions.

CROP 5002 **Advanced Turf Management**
8 credit points. Dr Martin. **Semester: 2. Classes:** July. **Prerequisite:** CROP 5001 Turf Management. **Assessment:** one vive voca exam (1 hr), assignments and prac. exercises.
Lectures, discussions and practical experiments to gain advanced expertise in laboratory and field aspects of the plant sciences underlying turf management. Topics include germination and establishment, stress physiology, irrigation and water use, root growth, growth analysis, canopy photosynthesis, fertilizer and pesticide management, environmental legislation and emerging issues for turf management.

CROP 5003 **Turf Species and Varieties**
4 credit points. Dr Martin. **Semester: 2. Assessment:** one 2hr theory exam, prac exam, plant collection.
This unit, which is given as intensive workshops, has three aims: to provide an overview of plant variation, ecotypic differentiation and taxonomy; to teach skills in plant identification (use of botanical terminology and use of conventional and vegetative taxonomic keys); and to recognise commercially-important turf species and varieties and weeds. Information is also provided on biochemical methods of identifying grasses; develop-ment of new cultivars by breeding and/or selection; comparative testing of grasses: plant variety rights and cultivar registration.

CROP 5004 **Applied Plant Ecology**
4 credit points. Dr Michael, Dr Martin. Semester: 2. Assessment: one 3hr exam, assignments and an individual seminar.
Aspects of plant protection and their effects on the environment. Interaction between weeds, pests and diseases; contamination of groundwater; herbicide and pesticide safety and other topical issues. In addition to written assignments, each student will be required to choose a topic in consultation with the lecturer and subsequently present a seminar for the class on that topic. For example, a golf course manager might address the ecological management of pest susceptible, regularly cut turf grasses growing on soils of low cation exchange capacity outside the usual thermal limits of the grasses.

CROP 5005 **Irrigation Science**
4 credit points. Coordinator Dr Sutton. Semester: 2. Classes: (1 lec & 3 prac/workshop)/wk. Assessment: one 2000w report, one 1500w essay.
The unit covers the scientific basis of irrigation practice. Modification of productivity potential through irrigation. Objectives of irrigation. Biological, physical and technical aspects of irrigation science, including furrow, flood, sprinkler and drip systems. Efficiency of water use and the proper use of instrumentation for irrigation management.
Reference book
M. E. Jensen Design and Operation of Farm Irrigation Systems (American Society of Agricultural Engineers, 1980)

CROP 5006 **Crop Protection (Advanced)**
4 credit points. **Semester:** 2. Classes: July. **Assessment:** one 2 hr theory exam, laboratory work.
This unit considers the impact of weeds, insects and other invertebrates and disease on plant production and the various strategies for protecting plants from resulting damage. Environmental issues associated with pest control are emphasised. Topics covered include; crop loss assessment and economic threshold of damage; the origins of pest and disease problems and epidemiology; the major pest and disease problems in Australia; the use of pesticides and resistance to them; legislative aspects, and the role of quarantine and biological control agents for weeds, insects and pathogens. Laboratory work includes the biology of important fungal plant pathogens, the technology of spray application and case studies in integrated pest management.

CROP 5009 **Diagnostic Methods in Turf Management**
2 credit points. Coordinator Dr Martin. **Semester:** 1. **Classes:** 7 lec & seven 3hr prac. **Prerequisite:** CROP 5001 Turf Management, CROP 5010 Turf Nutrition. **Assessment:** one 1.5hrexam, an assignment and a prac exam.
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 provide an introduc-tion to the theoretical basis and practical application (including interpretation guidelines) of selected chemical methods used for diagnostic purposes in the turf industry for soils, irrigation waters and plant tissues.
Reference book
G.E. Rayment and F.R. Higginson Australian Laboratory Handbook of Soil and Water Chemical Methods (Iskanta Press, 1992)

CROP 5010 **Turf Nutrition**
4 credit points. Semester: 1. Assessment: one 2hr exam, assignments.
Essential and non-essential elements. Mineral toxicities. Physiology of nutrient uptake and use by grasses. The soil as a source of plant nutritients. Plant-soil interactions with special emphasis on root dynamics, soil water status and the rhizosphere. Quantitative aspects of turf nutrition and design of fertilizer programs.

CROP 5011 **Research Project 1 (Turf)**
10 credit points. Semester: 1, 2. Classes: February or July.
Candidates will conduct and report on a well-defined investigation into an area of interest in turf management.

CROP 5012 **Research Project 2 (Turf)**
10 credit points. **Semester: 1, 2. Classes:** February or July.
See CROP 5011

CROP 5013 **Research Project A1 (Turf)**
6 credit points. **Semester: 1, 2. Classes:** February or July. **Corequisite:** CROP 5014.
Candidates will conduct and report on a well-defined investigation into an area of interest in turf management.

CROP 5014 **Research Project A2 (Turf)**
6 credit points. **Semester:** 1, 2. **Classes:** February or July.
See CROP 5013

■ Agricultural Entomology

ENTO5002 **Special Topics in Entomology**
8 credit points. Semester: 2. Assessment: assignment.
The course deals with specialised areas of particular interest to each candidate. Candidates will be given a selected reading list and will prepare discussion papers and essays on these topics.

ENTO 5003 **Taxonomy and Biogeography of Insects**
8 credit points. Semester: 1. Classes: (2 lec & 6 prac)/wk. Assessment: one 3hr exam & one 3hr prae exam, assignment.
The classification, life cycle and general biology of some orders of insects will be considered. Candidates will be given an introduction into the philosophy of taxonomy. Lectures will deal with insect zoogeography and phylogeny. Practical classes will give students good working knowledge of some insect orders. The collection will supplement the practical classes.

ENTO 5004 **Insect Ecology (Advanced)**
8 credit points. Dr Meats. Semester: 2. Classes: (2 lec & 6 prac)/wk. Assessment: one 3hr exam, assignment.
Ecological principles will be dealt with as they apply to conservation, sustained-yield harvesting and pest management (classical and managed biological control, sterile male techniques, behavioural and integrated systems). The remainder of the course will emphasise behavioural mechanisms of importance to ecological systems. Further topics to be covered range from foraging theory and predator-prey interactions to interference mechanisms and opportunistic responses.

ENTO 5005 **Insect Collection**
4 credit points. **Semester: 2. Assessment:** Insect collecting and mounting.
Students are shown how to collect, mount and store insects. A representative insect collection is required.

ENTO 5006 **Research Methods in Entomology A1**
8 credit points. **Semester:** 1.
This will involve analytical laboratory work, manage-ment of experimental data and writing up of data for critical review.

ENTO 5007 **Research Methods in Entomology A2**
8 credit points. Semester: 2.
See ENTO 5006.

■ Agricultural Genetics and Plant Breeding

BIOL 3103 **Molecular Genetics and Recombinant DNA Technology**

This unit of study is not available in 2002.

GENE 5001 **Biotechnology**

4 credit points. Dr Sharp. **Semester: 1,2.**

A series of lectures and practical periods covering: techniques and potential uses of plant transformation in manipulating plant quality and agronomic characteristics; the use of molecular techniques in the diagnosis of plant diseases in plant breeding; the construction and use of genetic maps for selection in plant breeding programs.

GENE 5002 **Breeding for the Environment**

4 credit points. Dr Darvey. **Semester: 1,2. Assessment:** Literature review, assignments.

Lectures and practical periods dealing with management of pests, diseases (fungi, bacteria and viruses) and environmental pollutants. Deals briefly with soil degradation and weed control. The plant breeding options will be discussed, including the selection, identification and transfer of genes for resistance to diseases, mineral toxicities, etc. The details of the National Rust Program and its philosophy for the genetic control of the rusts will be elaborated at both a theoretical and practical level. The greenhouse effect and the management options for rapidly altering breeding strategies in response to a changing environment will also be discussed.

GENE 5003 **Cytogenetics and Genetic Manipulation**

4 credit points. **Dr** Darvey. **Semester: 1,2. Classes:** (mid year break, Jun/July). **Assessment:** one 2hr exam.

Lectures and lab work in cytogenetics emphasising cereals and genetic means for manipulation and alien incorporation. Cytogenetics component includes chromosome identification; aneuploidy; polyploidy; genome origins; genetic control of chromosome pairing; gene mapping; and cytogenetics of crop species. Genetic manipulation component includes: alien genetic transfer; induced mutation; alternative methods for the production of haploids; genetic and cytoplasmic male sterility; alternative systems for hybrid production; wide-species crosses; and identification of useful genes (apomixis, meiotic, restitution, endosperm and embryo quality from wide species crosses, parthogenesis, semigamy, etc.). Practical component includes: techniques for chromosome identification (Feulgen staining, C-banding, N-banding, autoradiography); various tissue culture techniques including somaclone production and anther culture; and various other laboratory and greenhouse techniques including mutation breeding, chromosome doubling, etc.

Visits are made to key research centres including the CSIRO Division of Plant Industry in Canberra in conjunction with the biotechnology unit.

GENE 5004 **Germplasm Management**

4 credit points. Dr Darvey. **Semester: 1,2. Assessment:** literature review, assignments.

Lectures on strategies and methods for germplasm collection, storage, evaluation, and utilisation; and on germplasm databases. A review of major international germplasm centres is also included.

GENE 5005 **Plant Breeding A**

8 credit points. Dr Darvey. Semester: 1,2. Classes: mid-year break (Jun/July). Assessment: open book exam, seminar assignments.

Lectures and laboratory work on the theory and philosophy of plant breeding. Special emphasis is placed on present and future technologies with respect to anther culture, mutation breeding, breeding for disease resistance, somaclonal variation, apomixis, interspecific hybridisation, the wheat x maize system for haploid production, hybrid producing systems and microspore culture for the production of transgenic plants. The unit aims to develop perspective in relation to research priorities and realistic research objectives. It also considers various aspects of program design and efficiency, including the cost of establishing and maintaining programs, returns to growers, and sources of income (PVR, patents, hybrid seed, etc.).

GENE 5006 **Plant Breeding B**

4 credit points. **Semester: 1, 2. Assessment:** literature review, assignments.

A review of various plant breeding programs, obtained from field trips to public and private breeding centres in eastern Australia, including the Phytotron in Canberra. The unit includes practical hands-on field experience. It also includes various aspects of plot design and automated data analysis, which are mainly presented during the visit to the Plant Breeding Institute at Narrabri.

GENE 5007 **Introductory Plant Breeding**

4 credit points. Dr Darvey. Semester: 1,2.

Approximately 30 lectures and 30 hours of laboratory work devoted to the theory of plant breeding, conservation of genetic variability, breeding for resistance to disease and measurements and analysis of data.

GENE 5008 **Quantitative Genetics**

4 credit points. **Semester: 1**,2.

A series of lectures and practical periods, dealing with population genetics and quantitative inheritance in plants or animals (PBI, Cobbitty if plants, or Department of Animal Science if animals)

GENE 5011 **Research Project Additional**

4 credit points. Semester: 1,2. Classes: February or July semester.

An attempt is made to tailor the project to the student's requirements, thus discussion of project requirements is welcome prior to enrolment.

GENE 5012 **Research Project (Agr Genetics) A1**

8 credit points. Semester: 1. Classes: February semester.

Candidates will conduct and report on a well-defined investigation into an area of interest in agricultural genetics.

GENE 5013 **Research Project (Agr Genetics) A2**

8 credit points. **Semester: 2. Classes:** July semester.

See GENE 5012

GENE 5014 **Research Project (Plant Breeding) A1**

8 credit points. Semester: 1. Classes: February semester.

An attempt is made to tailor the project to the student's requirements, thus discussion of project requirements is welcome prior to enrolment. Projects may be carried out at any of the Plant Breeding Institute locations (Campus, Cobbitty, Narrabri); however Australian students with access to approved research facilities (other universities, public or private breeding centres or laboratories, CSIRO, etc.) will be exempted from this requirement, subject to adequate supervision.

GENE 5015 **Research Project (Plant Breeding) A2**

8 credit points. **Semester: 2. Classes:** July semester.

See GENE 5014.

■ Horticultural Science

HORT 5006 **Special Topics in Horticultural Science**

4 credit points. **Semester: 1**,2.

This unit deals with specialised areas of horticultural science of particular interest to each candidate. Examples of areas could include plastic recycling in horticulture or environmental risk of herbicides used by nurseries. Candidates will be given a selected reading list and will prepare discussion papers and/or essays.

HORT 5010 **Urban Horticulture (Advanced)**

4 credit points. tDr Martin. **Semester: 1. Classes:** (3 lec 3 prac)/wk. **Assessment:** tone 2 hr exam (50%) prac reports (25%) assignments (25%).ft.

The unit covers the physiology, ecology, and management of urban trees; scientific aspects of design and management of sports field, parklands, and open areas, including management of native vegetation; and the environmental impact of urban horticultural activities and appropriate remedial strategies.

HORT 5011 **Research Project (Horticultural Science)**

24 credit points. Semester: 1, 2. Classes: February and July.

tCandidates will conduct and report on a well-defined investigation into an area of interest in horticulture.

HORT 5012 **Flower and Nursery Crops (Advanced)**

4 credit points. Dr Goodwin. Semester: 2. Classes: (2 lec, 2 prac)/wk;. Assessment: one 2hr exam (60%), assignments (40%).

A discussion of the major aspects of the production of cut-flower and nursery crops, including protected cropping and glasshouse management. The unit will provide students with a detailed appreciation of the need for and methods of developing more precise production technology for these industries.

HORT 5015 **Postharvest Biology and Technology (Adv)**
4 credit points. Dr McConchie. Semester: 1. Classes: (3 lec 3 prac)/wk. Assessment: two 1 hr exams (60%) assignments (40%).
The unit focuses on understanding the maintenance of quality during the harvesting, handling, storage and marketing of fresh horticultural produce. The subject addresses the technical issues and economic challenges associated with the delivery of living products to the consumer. Students will draw on examples from fruit, vegetable, cut flower, nursery, mushroom and turf crops.

HORT 5016 **Issues in Horticultural Sciences A**
4 credit points. **Semester: 1. Classes:** (1 lec, 1 sem, 1 lab)/wk. **Corequisite:** HORT 5017. **Assessment:** one **1** hr exam, essay and/or a design and report.
Students attend a series of workshops, seminars and excursions designed to provide them with a broad overview of current issues affecting the horticultural industries, and prepare an essay of 5000 words and/or a design and a report, and give a seminar on a topic of their choice, selected from a list which covers the main efficiency, marketing and environmental issues affecting Australian horticulture.

HORT 5017 **Issues in Horticultural Sciences B**
4 credit points. **Semester: 2. Classes: (1 lec, 1 sem, 1 lab)/wk. Corequisite: HORT 5016. Assessment:** one 1 hr exam, essay and/or a design and report.
See HORT 5016

HORT 5018 **Research Project 1 Horticultural Science**
12 credit points. Semester: 1, 2. Classes: February or July.
Candidates will conduct and report on a well-defined investigation into an area of interest in horticulture

HORT 5019 **Research Project 2 Horticultural Science**
12 credit points. **Semester: 1,2. Classes: February** or **July. Corequisite:** HORT 5018.
Candidates will conduct and report on a well-defined investigation into an area of interest in horticulture.

HORT 5020 **Research Project 3 Horticultural Science**
6 credit points. Semester: 1, 2. Classes: February or July. Corequisite: Either HORT 5018 or HORT 5019.
Candidates will conduct and report on a well-defined investigation into an aea of interest in horticulture.

■ Microbiology

MICR 5001 **Microbiology A (Advanced)**
12 credit points. Dr Ferenci. Semester: 1. Classes: (3 lec, 6 prac, 3 other activities)/wk. Corequisite: MICR 5002 Microbiology A (Advanced). Assessment: one 1.5 hr and one 2 hr theory exams, prac.
The coursework for this unit follows substantially the same syllabus as the senior unit of study for Science students, General and Medical Microbiology (MICR 3001). As well as lectures and practical classes there is a variety of other activities, including workshops on library searches and laboratory instrumentation, mini lectures on data handling and laboratory safety, poster presentations, skills testing and tutorials. The unit of study covers two general areas:

Medical Microbiology - medical bacteriology, virology and parasitic diseases, epidemiology.

General Microbiology - microbial growth and metabolism, microbial ecology, food microbiology.

MICR 5002 **Microbiology B (Advanced)**
12 credit points. Dr Ferenci. Semester: 2. Classes: (3 lec, 6 prac, 3 other activities)/wk. Corequisite:: MICR 5001 Microbiology A (Advanced). Assessment: one 1.5 hr and one 2 hr theory exams, prac.
The coursework for this unit follows substantially the same syllabus as the senior unit of study for Science students, Molecular and Environmental Microbiology (MICR 3002). As well as lectures and practical classes there is a variety of other activities, including workshops, mini lectures, poster presentations, skills testing and tutorials. The unit of study covers two general areas:

Molecular Microbiology: aspects of bacterial structure and physiology, principles of molecular pathogenicity.

Environmental Microbiology: microbial ecology, plant microbiology.

MICR 5005 **Research Project (Microbiology) A1**
8 credit points. Dr Ferenci. **Semester:** 1. **Corequisite:** MICR 5006.
Candidates are required to undertake a project, which will normally span 2 semesters, and submit a report in some advanced aspect of agricultural microbiology related to the area of interest.

MICR 5006 **Research Project (Microbiology) A2**
8 credit points. Dr Ferenci. **Semester: 2. Corequisite:** MICR 5005.
See MCR 5005.

MICR 5007 **Research Project (Microbiology) B1**
12 credit points. Dr Ferenci. Semester: 1. Corequisite: MICR 5008.
Candidates are required to undertake a project and submit a report in some advanced aspect of Microbiology related to the area of interest.

MICR 5008 **Research Project (Microbiology) B2**
12 credit points. Dr Ferenci. Semester: 2. Corequisite: MICR 5007.
Candidates are required to undertake a project and submit a report in some advanced aspect of Microbiology related to the area of interest.

MICR 5009 **Special Aspects of Microbiology A1**
4 credit points. Dr Ferenci. **Semester: 1,2. Classes:** February or July. **Corequisite:** MICR 5010.
The unit of study may include tutorials, seminars, essays and directed reading on selected topics.

MICR 5010 **Special Aspects of Microbiology A2**
4 credit points. Dr Ferenci. **Semester: 1, 2. Classes:** February or July. **Corequisite: MICR 5009.**
The unit of study may include tutorials, seminars, essays and directed reading on selected topics.

■ Plant Pathology and Plant Protection

CROP 5006 **Crop Protection (Advanced)**
4 credit points. **Semester: 2. Classes: July. Assessment:** one 2 hr theory exam, laboratory work.
This unit considers the impact of weeds, insects and other invertebrates and disease on plant production and the various strategies for protecting plants from resulting damage. Environmental issues associated with pest control are emphasised. Topics covered include; crop loss assessment and economic threshold of damage; the origins of pest and disease problems and epidemiology; the major pest and disease problems in Australia; the use of pesticides and resistance to them; legislative aspects, and the role of quarantine and biological control agents for weeds, insects and pathogens. Laboratory work includes the biology of important fungal plant pathogens, the technology of spray application and case studies in integrated pest management.

PPAT 5002 **Defence Mechanisms of Plants**
6 credit points. Semester: 1. Assessment: one 3hr exam, assignments.
Lectures and laboratory classes on the genetic and physiological aspects of the interactions between plants and pathogens underlying disease resistance.

PPAT 5004 **Research Methods in Plant Pathology A**
16 credit points. **Semester:** 2.
This unit involves analytical laboratory work and the management of experimental data, together with essay assignments on a range of topics in experimental plant pathology. A written report is required on the experimental work.

PPAT 5005 **Soil Biology and Biodiversity**
6 credit points. Prof. Burgess. **Semester:** 1. **Assessment:** one 3hr exam, assignment.
An introduction to the diversity of organisms found in the soil, and the ecological principles governing their activities and interactions. Practical applications are illustrated with particular reference to soilborne plant diseases. Practical classes demonstrate important tecniques for working with soil organisms and soilborne diseases, and for controlling the soil environment, especially soil water, to manipulate biological activity. Topics covered include the nature of the soil biota; isolation, identification and quantification of soil organisms; pathogenic and mutualistic interactions between fungi and roots; mycorrhizae; the nature and control of soilborne plant diseases; effects of water potential and temperature on the activity and survival of soil fungi; temporal and spatial distribution of soil fungi and soilborne diseases; and the soil biology of conservation farming.

PPAT 5006 **Special Topics in Plant Pathology**
8 credit points. Semester: 2.
This unit deals with specialised areas of particular interest to each candidate. Candidates will be given a reading list on which essays and/or seminars will be presented.

PPAT 5010 **Plant Protection Research Methods A1**
8 credit points. Semester: 2. Assessment: Assignment.
This will involve analytical laboratory work, and management of experimental data on a topic in plant protection.

PPAT 5011 **Plant Protection Research Methods A2**
8 credit points. Semester: 2. Assessment: Assignment.
See PPAT 5010.

PPAT 5012 **Research Methods in Plant Pathology B1**
6 credit points. Semester: 1.
This unit involves analytical laboratory work and the management of experimental data, together with essay assignments on a range of topics in experimental plant pathology. A written report is required on the experimental work.

PPAT 5013 **Research Methods in Plant Pathology B2**
6 credit points. Semester: 2.
See PPAT 5012

PPAT 5014 **Adv Field/Lab Studies in Plant Disease**
6 credit points. Professor Burgess, Dr Summerell, Dr Park, Dr Wellings and external specialists. Semester: 1.
This module is designed to provide experience in field studies on the diagnosis and control of plant disease and diagnostic procedures for all types of pathogens. It will include studies in modern approaches to fungal taxonomy and identification, including molecular techniques. It will also include an introduction to modern methods for breeding for resistance to pathogens. An introduction to scientific investigations and literature surveys including computer research techniques will also be included

■ Soil Science, Soil Conservation and Soil Contamination

AGEC 5010 **Natural Resource Economics (Advanced)**
8 credit points. Semester: 2. Classes: 3 lec & 1 tut/lab)wk. Assessment: one 3hr exam, assignments.
A unit in natural resource economics of relevance to agriculture and the resource industries. Issues discussed are: the environment as a source of environ-mental services; socially efficient resource allocation and Pareto welfare economics; market failure and characteristics of environmental services; benefit cost analysis of public projects, including the modification of environmental services; non-depletable resources and pollution; depletable resources; irreversibility; sustainability. Applications include land degradation, fisheries, forestry, land-use planning and greenhouse effect.

SOIL 5001 **Adv Methods of studying & Analysing Soil**
6 credit points. Prof McBratney, Dr Singh, Dr Cattle. Semester: 2. Classes: (3 lec, 1 tut & 8hr prac)/7wk (2nd half). Assessment: one 3hr exam, lab report, problem sets, essay.
Seven weeks of lectures and practicals concerning new and advanced methods for studying soil. Topics include electronic microscopy, advanced X-ray analysis, soil dating techniques including 13 C and thermoluminescence, dynamic simulation modelling of carbon turnover, quality control of routine analytical techniques and measurement of soil microbial biomass.

SOIL 5002 **Advanced Pedology**
6 credit points. Semester: 1.
Prof. McBratney for description.

SOIL 5003 **Chemistry of the Soil Environment**
6 credit points. Semester: 2. Classes: (3 lec, 1 tut & 8hr prac)/7wks (first half). Assessment: one 2hr exam, prac report, problem sets, essay.
Topics include cation exchange capacity and pH dependent charge, soil charge characteristics, soil chemical analyses and their interpretation, formation of acid soiloAl and Mn toxicities, chemistry and adsorption/desorption of K, P and S in soil, soil solution and speciation of ionic components, soil salinity and sodicity, oxidation/ reduction reactions in soil and chemistry of soil organic matter and nitrogen.

SOIL 5004 **Form Eval & Management of Soil Resource**
8 credit points. Prof. McBratney. Semester: 2. Classes: (4 lec & 3hr prac)/wk, 5 days in the field. Assessment: one 3hr exam, report, field and lab work.
Lectures on classification of soil, soil survey, pedological processes, geomorphology and soil stratigraphy, aerial photography, geostatistics and their application to land evaluation for rural purposes, the forms of land degradation occurring in Australia, and management conducive to sustainable soil husbandry.

Field work involves landscape description and the description, mapping and sampling of soil profiles for the purpose of assessing land use capability and field variability of soil properties.

Laboratory work involves routine physical and chemical tests of samples taken in the field relevant to assessment of the land-use potential and the quantification of the soil variability at the survey site.

SOIL 5005 **Physical Modelling of Soil Environment**
6 credit points. Prof. McBratney. Semester: 1. Classes: (2 lec, 1 tut & 5hr prac)/7wks, 5 days in the field (first half). Assessment: one 2hr exam, field and prac reports, problem sets, essays.
The emphasis is to examine the quantitative aspects of soil physics particularly in relation to the transfer of energy, gas, water, solids and solutes in soil.

Lecture and laboratory topics include heat flow, gas movement, soil water energetics, saturated and unsaturated flow of soil water, infiltration, solute movement, water and wind erosion as well as the fundamentals of numerical computer modelling of soil physical processes.

Field work involves field measurement of soil physical properties such as hydraulic conductivity and infiltration rates and moisture content.

SOIL 5006 **Soil Contamination**
10 credit points. Dr Singh. Semester: 2. Classes: (4 lec & 1 prac)/wk; 5 days of fieldwork. Assessment: one 3hr exam, essay, field and lab work.
The unit explores topical environmental issues concerned with soil contamination and considers causes of soil contamination; sampling of contaminated soil, analysis and interpretation; hazards posed to biological systems; and soil and waste management strategies in pollution prevention and land reinstate-ment. Amongst the topics considered are sewage sludge (heavy metals and organics), agrochemicals (pesticides and nitrogenous fertilisers), acid rain (aluminium toxicity), industrially-contaminated land (petrochemicals, cyanides, phenols, asbestos, catalysts, PAHs, PFA, strong acids/bases), domestic waste (methane, plastics, metalliferous materials), mines and mine wastes (coal, oil shale, metal ore mining) and reinstatement of spoiled soils (soil storage/emplacement, slope stability, vegetation establish-ment, use of ameliorants, end-use sensitivity).

Laboratory classes will involve the study and determination of soil contaminants and investigations into their retention, movement and phytotoxicity. Site visits will provide an opportunity to view problems and practical solutions in the field.

SOIL 5007 **Soil Mineralogy, Pedogenesis & Taxonomy**
6 credit points. Semester: 1. Classes: (3 lec, 1 tut & 8hr prac)/7wks. Assessment: one 2hr exam, prac reports.
This unit centres on a weathering study which traces the changes from a rock parent material up through the soil profile. The methods of study include particle-size analysis and extraction of a fine-sand fraction for optical identification and quantification of the mineral species present. Thin sections of the rock and profile are prepared, examined and the main features identified and quantified. The data from the sand analysis, micrornorphological investigations and clay mineral assessments are used to provide an understanding of the pedogenesis of the particular soil. A detailed study, including exercises, is made of the USDA soil classification system, Soil Taxonomy.

SOIL 5008 **Soil Properties and Processes**
8 credit points. Prof. McBratney, Dr Cattle. Semester: 1. Classes: (4 lec & 4hr prac)/wk, 1 day in the field. Assessment: one 3hr exam, class work, prac book.
This unit includes the fundamental properties of soil, the factors of soil formation, and the processes that operate in the soil system. Components comprising pedology, soil physics, soil chemistry and soil biology are synthesised by reference to

common soil horizons and profiles from N.S.W. Field studies start with description and assessment of essential characteristics. The physics of water and gas movement, temperature, density, swelling and strength are considered. The chemistry of soil solids, surfaces and solutions are discussed as well as macronutrients and micro-nutrients and problems such as salinity, acidity and waterlogging. There is also some discussion of soil microorganisms and microbiological transformations in the soil.

SOIL 5009 Strategies for Soil Conservation

10 credit points. Semester: 2. Classes: 10 days in the field (semester breaks). Assessment: assignment, seminar.
Candidates will investigate and integrate biological, chemical, physical, economic and sociopolitical constraints on soil conservation in the context of a particular enterprise, farming system or geographic region. This will involve the design and execution of a field-sample survey. The concepts of land care and sustainable development will be investigated thoroughly.

SOIL 5010 Research Project A (Soils)

8 credit points. Semester: 1, 2. Corequisite: SOIL 5012.
Candidates will conduct and report on a well-defined investigation into an area of interest in soil science or soil conservation.

SOIL 5011 Research Project (Soils)

16 credit points. Semester: 1,2.
Candidates will conduct and report on a well-defined investigation into an area of interest in soil science or soil contamination.

SOIL 5012 Research Project A1 (Soils)

8 credit points. Semester: 1,2. Corequisite: SOIL 5010.
Candidates will conduct and report on a well-defined investigation into an area of interest in soil science or soil conservation or soil contamniation.

6 Postgraduate research and scholarships

■ Postgraduate research institutes

Plant Breeding Institute

The Plant Breeding Institute associated with the Faculty promotes the science of plant breeding, and the improvement of crop plants available for cultivation in New South Wales. The Institute is governed by a council composed of the Vice-Chancellor, members of the NSW Wheat Research Foundation, members of the Faculty of Agriculture, Food and Natural Resources, and a representative of the NSW Minister for Agriculture. The Professor of Plant Breeding is the Director of the Institute.

Institute of Advanced Studies

The Institute of Advanced Studies was established within the Faculty of Agriculture, Food and Natural Resources in 1974 to advise the Senate regarding several bequests. The Institute will use the funds to further the development of postgraduate studies and research in the Faculty, and be responsible for the administration of the scholarship program of the Faculty. It is intended that the Institute shall promote the attraction of additional income.

The directors of the Institute are appointed from and by members of the Faculty of Agriculture who are full-time permanent members of the departments. The Dean and Associate Dean (Postgraduate Studies) are ex officio directors.

Summary of scholarships and prizes

The table below (see Table 6.1: Summary of scholarships and prizes on page 57) is a summary only; for full details concerning the conditions governing the awards of these prizes and scholarships contact the Research Office.

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 GHS and IR Lightoller Scholarship*
The Charles Gilbert Heydon Travelling Fellowship in the Biological Sciences
The Eleanor Sophia Wood Travelling Fellowships
The Herbert Johnson Travel Grants*
The Commonwealth Scholarship and Fellowship Plan Awards
*Grants in aid

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.

■ Postgraduate scholarships and prizes

The University of Sydney on the recommendation of the Faculty of Agriculture 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 Lawrance 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.

■ Common terms and conditions of award

The scholarships are awarded under the following general terms and conditions of award:

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:
   (a) for the degree of Master, for up to two years, or
   (b)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:
   (a) who has been enrolled previously for a higher degree in the Faculty, reduced by the time credited towards the degree for which the candidate enrols, or
   (b) 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

The following specific terms and conditions of award apply:

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.

Table 6.1: Summary of scholarships and prizes

Scholarship	Value $	Closing date	Other information
Tenable at the University of Sydney			
Australian Postgraduate Awards	as for APA	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	For research in chemistry in relation to industry and agriculture
Richard Claude Mankin Scholarship - 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
Awards restricted to candidates in Agriculture			
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	30 April	Travel grant or grant-in-aid to candidates in the discipline of agricultural entomology
Irvine Armstrong Watson Scholarship	up to 500	30 April	Travel grant or grant-in-aid to candidates in the disciplines of agricultural genetics, biometry, plant breeding or plant pathology
Faculty scholarships			
The following five are identical (except that the FH Loxton is restricted to males - under review) and are awarded annually depending on the availability of funds.			
Thomas Lawrence Pawlett Postgraduate Scholarship	as for APA	31 October	Graduates for full-time research within Faculty (preference to Hons I or II Div. 1 or equivalent)
Christian Rowe Thornett Scholarship	as above	31 October	as above
Alexander Hugh Thurburn Scholarship	as above	31 October	as above
WC Turland Postgraduate Scholarship	as above	31 October	as above
FH Loxton Postgraduate Scholarship	as above	31 October	as above. Restricted to males

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 Thurburn Scholarship

In 1972 the Faculty of Agriculture received a bequest from Mary Esme Thurburn, 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 Thurburn Scholarship.

WC Turland Postgraduate Scholarship

The scholarship was established in 1976 by a bequest from W.C. 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

[Under review]

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
- Postgraduate Research Scholarships.

The name of the scholarships shall be the FH Loxton Postgraduate Studentships.

The scholarships are for postgraduate Research and shall be awarded on the basis of academic merit.

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.

(Remaining conditions for Agriculture are the same as for Turland, Pawlett etc)

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 30 April 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.

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 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 $1,000.
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 30 April 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 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 30 April each year.

7 Other Faculty information

This chapter of the handbook 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, see The University of Sydney Diary, available free from Student Union outlets.

■ Enrolment

New students and re-enrolling students who do not satisfy the pre-enrolment conditions collect their enrolment forms from the Faculty Office in the McMillan Building where they choose units of study and lodge a registration form.

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 subjects 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 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.

If you wish to:

- change a subject in which you are enrolled;
- discontinue a subject; or
- discontinue enrolment totally;

you should apply at the Student Centre or Faculty Office for the appropriate form and then at the Faculty Office to obtain approval. Your record at the University will not be correct unless you do this. It is not sufficient for instance to tell the lecturer, associate lecturer or even the departmental office that you discontinued a subject. Unless an enrolment change is approved formally at the Faculty Office it will not be accepted by the University and in some cases will incur a financial liability under HECS.

■ Examinations

There are two formal examination periods each year:

Period	Held	Approximate duration
Semester 1	June	2 weeks
Semester 2	November	3 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, etc. Some departments do not examine during the February semester.

The following information applies to the Bachelor of Agricultural Economics, Bachelor of Animal Science, 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 the Intranet, displayed on departmental noticeboards and posted directly 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 your department 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 and any other assessment material may be retrieved within a reasonable time 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 subject 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
Pass (Concessional) *see below*	46-49 (Years 1 & 2 in BAnimSc, BHortSc, BLWSc,BScAgronly)
Fail	below 46 (Years 1 & 2 in BAnimSc, BHortSc, BLWSc,BScAgronly)
Fail	0-49

Concessional passes

(a) The award of a Pass (concessional)(marks 46-49) in a unit of study entitles the student to receive credit points for that unit of study and to continue in the degree course unhindered.

(b)The concessional pass is not available for candidates in the BAgrEc and BResEc degrees.

(c) For candidates in the BAnimSc, BHortSc, BLWSc and BScAgr degrees:

(i) Concessional passes are available only in level 1000 units of study (maximum of 12 credit points) and level 2000 units of study (maximum of 14 credit points)

(ii) When Concessional pass results total more than 12 (level 1000) or 14 (level 2000) credit points, the student shall decide which unit of study or units of study to count for the degree.

Illness or misadventure

You may apply to the Registrar in writing for special consideration of your examination performance on grounds of illness or misadventure. In the case of illness a medical certificate should be provided. The minimum requirements of a medical certificate are that it:

(a) be submitted and signed by your own medical practitioner and indicate the dates on which you sought attention;

(b) certify unambiguously a specified illness or medical disability for a definite period;

(c) indicate the degree of your incapacity, and express a professional opinion as to the effect of your illness on your ability to take an examination.

Certificates in connection with annual examinations should be submitted prior to the examinations, unless the illness or misadventure takes place during the examinations, in which case the evidence must be forwarded as soon as practicable, and in any case before the close of the examination period. There is a special form available at the Student Centre and at the University Health Service for submission with medical certificates.

For consideration on the grounds of misadventure, your application must include a full statement of circumstances and any available supporting evidence.

■ 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, of the University Counselling Service, and of the University Health Service, are all available for consultation and can give advice on appropriate action to take.

■ Ancillary fees and charges

The following fees and charges from 2001 can be a guide for similar charges in 2002.

Agricultural Chemistry and Soil Science

Laboratory manuals and lecture notes are sold to students at below cost (combined charges are $25 for each unit of study). Students are advised of charges at the beginning of the respective unit. Students may access these materials electronically or from a copy kept in the Department.

Students are required to contribute towards the cost of accommodation for excursions in optional 3 rd and 4 th Year units in Soil Science and Agricultural Chemistry (approximately $100-180, depending on the excursion). The balance of the accommodation costs, transport and some meals are covered by the Department.

Crop Sciences

All first to third year students have free email and a free computer printing allocation of 125 pages to cover what may be expected by way of assignments and computer output from practical classes. For personal or additional printing they pay at the same rate as that set by the Department of Agricultural Economics, namely $11 per 125 pages. Fourth Year and Postgraduate students have unlimited printing rights but printing is monitored on an individual basis.

Agricultural Science 1, Horticultural Science 1, Land and Water Science 1

Handbook at cost, approximately $14 (voluntary).

Crop Science 2 and Plant Disease 3

There are charges for handbooks of procedures for laboratory work at cost recovery - ie, printing costs are met. The manuals assist students in performing lab work. They are verbally advised of the fee at the beginning of the course. The manuals are not available in the library.

Agricultural Genetics

There have been no extra fees in undergraduate courses. For the MAgr (coursework) degree, students pay for accommodation on field trips, but no money goes to the Department.

Biometry

Printed manuals are available for most units. In 2000 the charge was $15 per manual, less than printing costs. Additional material is handed out during class at no cost. Students are advised orally and by email of the charge for each manual. The manual is available on the Department's computer network, as are practical and tutorial solutions.

Agronomy units

Agronomy 3 - No fees. Agronomy 4 - No fees for notes. Students pay for their accommodation (approx $200) on domestic excursions, but transport is provided at no charge. There is a voluntary excursion to New Zealand on which students pay their own airfares; other costs are met by the Department.

Fees for Faculty excursions

A standard $45 is charged for Second and Third year excursions. (Students must attend one of the First, Second or Third year excursions). This covers almost all meals needed during the trip and a booklet is issued to all students. Little or no profit is generated by this charge. Local transport is provided free. Students must reach the start point of each trip at their own expense (approx)$50.

The voluntary First and Fourth year excursions are self funding and the cost varies according to the level of accommodation chosen by the student (a range is offered). The fees are collected before the trip and there is no profit.

Microbiology

The Department recommends that students purchase Practical Manuals for the laboratory course from the Student Copy Centre at a cost recovery price ($14.00 in 2001). Copies of the manuals are available in laboratories if students wish to make photocopies of them. Other notes are provided gratis at lectures and practical classes.

Students are advised of fees, in written form, at the enrolment registration or first lecture or practical class.

Animal Science

There are charges for handbooks of procedures for laboratory work or additional materials for some units. While not mandatory, students are encouraged to purchase these. Charges would not exceed $35 for any unit. Students can borrow this material from teaching resource centres to photocopy, but the cost of photocopying the material exceeds the cost of the material made available in bulk as printing costs are less than photocopy costs. The materials improve learning.

Students are advised about handbooks during the first lecture in the unit or in the previous year. For other material, students are advised in lectures/practical classes/tutorials, as appropriate.

The cost of the excursion is approximately $100 which includes 80% of meals, accommodation, transport, entry to the Hay Merino show and notes.

An optional meat and carcass evaluation course is available through Werrington TAFE at a cost of $95. An additional variable cost is incurred for accommodation to attend the national judging competition.

Agricultural Economics

Students using computer printing facilities for personal purposes (including personal assignment writing) are charged $11 per 125 pages. Students are advised of these facilities and the charge during traimng in the use of the computer laboratory.

Other printers are available for students in the University, also with charges applying. Many use their own printers at home. Students who wish to use overheads in seminars can buy overheads for 50 cents per sheet. Students are advised in classes, where relevant. Fees are set to cover only direct and allocatable costs with no surplus.

In the units Economic Environment of Australian Agriculture and Applied Commodity Modelling, printed material is made available at the cost of printing. Purchase is optional. This is in addition to the unit of study handbooks supplied. Copies are held in the Library.

■ Scholarships and prizes

See also the section on financial assistance in the University of Sydney Diary.

HSC scholarships and prizes

These scholarships and prizes are awarded on the basis of HSC results and no applications are required. Further information can be obtained from the Scholarships Office.

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 Thursday from 9.30 am to 2.30 pm). In addition interest-free loans are available to students who are able to demonstrate financial need.

Other scholarships and prizes

University of Sydney (UoS) Scholarships (with Distinction, or with Merit, or one-off awards)

All three scholarships are provided by The University of Sydney from University funds. The UoS Scholarships (with Distinction) are currently valued at $8,000 per year while the UoS Scholarships (with Merit)are valued at $5,000 per year for the normal full-time duration of a student's first degree, subject to satisfactory progress. The one-off scholarships are $3,000 for

Table 7.2: Scholarships and prizes

Prize or scholarship	Value $	Qualification
AB ARE Prize	300	Highest honours aggregate at graduation in BAgrEc
Belmore Scholarships	500	Proficiency in First Year
	500	Proficiency in First Year Chemistry
	500	Proficiency in Second Year
	500	Proficiency in Soil Science 2 and Agricultural Chemistry 2
Brian G Davey Memorial Scholarships in Soil Science	400	Proficiency in Soil Science 2 and 3
Bruce Davidson Prize in Resource Economics	300	Proficiency in an essay or thesis in natural resource economics
Cotton Research & Development Corporation Prize	500	Proficiency in Fourth Year Agronomy
John Arthur Cran	100	Proficiency in HSC
Dairy Research Foundation	400	Proficiency in Fourth Year Animal Production
John Neil Downing Memorial	350	Proficiency in professional experience
John and Beatrice Froggatt	1000	Proficiency in Agricultural Entomology 1 and Fourth Year Agricultural Entomology
WW Froggatt Memorial	200	Proficiency in Agricultural Entomology project in Fourth Year
Golden Jubilee Scholarship in Agri Science	500	Proficiency in Third Year
Clifford Dawson Holliday	200	Proficiency in Third Year Examinations
DL Jackson	400	Proficiency in Agricultural Science I or Horticultural Science 1 or Land and Water Science 1
FC McCleery Memorial Award	200	Fellowship and Leadership in the Faculty (Third Year students)
Martin Mcllrath Scholarships*	490	Proficiency in HSC and First, Second and Third Years (men only). Preference to sons of ex-servicemen
Theresa G Makinson	100	Proficiency in Horticultural Science in Fourth Year
National Farmers' Federation	150	Proficiency in Fourth Year in degree of Bachelor of Science in Agriculture, Bachelor of Agricultural Economics or Bachelor of Horticultural Science
Sibella Macarthur Onslow	200	Proficiency in Agronomy in Fourth Year
AANRM Prize	n.a.	Proficiency in Crop Science 2 and Soil Science 2
FL Partridge*	400	For students in Third and Fourth Years in need of financial assistance
Poultry Research Foundation	400	Proficiency in Fourth Year Animal Production
Ridley AgriProducts Prize in Animal Nutrition	250	Proficiency in Animal Nutrition 3
Joyce Winifred Rouse	40	Proficiency in Agricultural Chemistry in Fourth Year
SUAGA Prize	n.a.	President, AGSOC
Sydney Chinese Association	100	Proficiency in Microbiology 3 (Science) or Agricultural Microbiology 3
GW Walker Memorial Essay	100	Most proficient essay in the unit Applied Marketing
Professor WL Waterhouse	80	Proficiency in Agricultural Genetics 2 & Plant Disease 3
Sir Robert Watt Memorial	80	Proficiency in Crop Science 2
Weed Society of NSW	100	Proficiency in Weed Science
NH White Memorial Prize	100	Proficiency in Plant Pathology in Fourth Year
AR Woodhill Prize in Entomology	300	Proficiency in Agricultural Entomology in First Year
Arthur Yates and Co Pty Ltd (2 prizes)	100	Proficiency in Agricultural Genetics in Fourth Year
	100	Proficiency in Horticultural Science in Fourth Year

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

one year only. These scholarships are available to applicants who:

- are citizens or permanent residents of Australia;
- UoS Scholarships (with Distinction)- are taking the NSW Higher School Certificate (HSC) or approved equivalent secondary school examination in 2001 or completed it in 2000 and have not commenced any university study. Applicants must have or expect to achieve a Universities Admission Index (UAI) of at least 98;
- UoS Scholarships (with Merit)- are taking the NSW Higher School Certificate (HSC) or approved equivalent secondary school examination in 2001 and expect to achieve a Universities Admission Index (UAI) of at least 95;
- UoS Scholarships (one-off)- see UoS Scholarships (with Merit)
- UoS Access Scholarships, Group of Eight (Go8) Scholarships and International Undergraduate Scholarships - information from the University's Scholarships Office or access the Web at www.usyd.edu.au/study/scholarships.shtml.

Application forms and further information can be obtained from school career advisers in July, or from the University's Scholarships Office. Applications close about the end of September.

Other scholarships

These include Council of Education Scholarship, The Freemasons' Scholarship, Martin Mcllrath Scholarships for Undergraduates in Agriculture, Spero Gravas Scholarship and James Robinson Orange Memorial Prize. Information on these scholarships is available from the Scholarships Office and applications close end of April.

Prize compositions

Details of these may be obtained from the Scholarships Office with whom applications generally close in the first week of second semester.

Faculty resolutions

A candidate who presents for re-examination in any subject shall not normally be eligible for any prize or scholarship awarded in connection with such examination.

ABARE Prize

Established in 1995 by ABARE for a prize in support of academic excellence in the field of agricultural economics. Awarded annually on the recommendation of the Head of the Department of Agricultural Economics to the student who attains the highest honours aggregate on graduation in the degree of Bachelor of Agricultural Economics. Value, $300.

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 of Agriculture to students in the Faculty. Two are tenable by students enrolling in the second year of the BAnimSc, BHortSc, BLWSc or BScAgr 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 student enrolling in the second year of the BResEc degree is also eligible for the first-year chemistry scholarship. A further two are tenable by students enrolling in the third year of the BAnimSc, BHortSc, BLWSc or BScAgr 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 Science 2 and Agricultural Chemistry 2. 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.

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 to the most proficient candidate at the Higher School Certificate or equivalent examination who enrols full-time in the first year of candidature for one of the following degrees Bachelor of Science in Agriculture, Bachelor of Animal Science, Bachelor of Agricultural Economics, Bachelor of Horticultural Science, Bachelor of Land and Water Science or Bachelor of Resource Economics provided that the student's work is of sufficient merit. Value, $100.

Dairy Research Foundation Prize in Animal Science

Established in 1977 by an offer from the Dairy Science Research Foundation of an annual donation for a prize in animal science with particular reference to dairying.

Awarded annually in the Faculty of Agriculture on the recommendation of the Sub Dean (Agriculture Teaching) in the Faculty of Veterinary Science to the student enrolled in the fourth-year subject Animal Production who achieves the highest proficiency with particular reference to dairying, provided the student's work is of sufficient merit. Value, $400.

Cotton Research and Development Corporation Prize

Established in 2001 by an annual donation of $500 from the Cotton Research and Development Corporation for the years 2001,2002 and 2003.

Awarded annually, on the recommendation of the Head of the Department of Crop Sciences after consulting academic staff most concerned, to the most proficient student in fourth year Agronomy in the BScAgr degree, provided that the candidate's work is of sufficient merit. The Sibella Macarthur Onslow Memorial Prize may not be awarded to the winner of the CRDC prize. Value, $500.

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 Head of the Department of Agricultural Economics, to an undergraduate student enrolled in the Faculty of Agriculture who submits an outstanding essay or thesis in the area of natural resource economics. Value $300.

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 Head of the Department of Agricultural Chemistry and Soil Science. One may be awarded to the most proficient student who achieves the highest aggregate mark in the units of study Soil Science 2 and Soil Science 3 in the Faculty of Agriculture and who enrols in the fourth year subject Soil Science 4 for a Bachelor of Science in Agriculture 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 Science 2 and Soil Science 3 in the Faculty of Science who enrols 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.

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. Value, $200.

John Neil Downing Memorial Prize

Established by R.G. 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 to the student in the Faculty of Agriculture who shows greatest proficiency in the professional experience requirement, provided the student's work is of sufficient merit. Value, $350.

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 Head of the Department of Crop Sciences to the student with the highest aggregate in the units of study Agricultural Entomology 1 and Fourth year Agricultural Entomology, 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 Head of the Department of Crop Sciences to the student in fourth year Agricultural Entomology who shows the greatest proficiency in a research project, if the student's work is of sufficient merit. Value, $200.

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.

Established in 1961 by the gift of £1574 18 s 0 d 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.

DL Jackson Memorial Prize

Established in 1975 by public subscription in memory of D.L. Jackson, Senior Lecturer in the Department of Agronomy and Horticultural Science.

To be awarded annually on the recommendation of the Head of the Department of Crop Sciences after consulting the professor most concerned to the most proficient student in the unit of study Agricultural Sciencel, Horticultural Science 1 or Land and Water Science 1 provided that the candidate's work is of sufficient merit. Value, $400.

FC McCleery Memorial Award

Estabbshed in 1979 by a series of donations over a number of years by the Reverend A.B. Catley, a graduate of the Faculty of Agriculture, for an award in that faculty. The award honours the memory of F.C. McCleery, BScAgr (1925), the former Chief Biometrician in the NSW Department of Agriculture. F.C. 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 shall be made annually after a ballot, conducted by the Dean, of third year students in the Faculty 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 K.J. Laurence, to establish a prize in memory of her aunt, Theresa Genevieve Makinson, 1885-1939.

Awarded annually, on the recommendation of the Head of the Department of Crop Sciences after consulting the professor most concerned, to the most proficient student in fourth year Horticultural Science, provided that the candidate's work is of sufficient merit. Value, $100.

National Farmers' Federation Prize

Established in 1987 by the offer of an annual donation by the National Farmers' Federation for a prize to encourage excellence in agricultural studies.

Awarded annually on the recommendation of the Dean and with the approval of the Faculty's Board of Examiners to the student who attains the highest honours aggregate on graduation in one of the following degrees Bachelor of Science in Agriculture, Bachelor of Agricultural Economics or Bachelor of Horticultural Science.

The prize may be shared. Value, $150.

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 Head of the Department of Crop Sciences after consulting academic staff most concerned for proficiency in the Fourth year subject Agronomy, provided the student's work is of sufficient merit. Value, $200.

Australian Association of Natural Resource Management (AANRM) Prize

Established in 1997 by an offer from the Soil and Water Conservation Association of Australia (NSW Branch) of an annual award of a certificate and a twelve month membership to the NSW Branch of SAWCAA. The prize was renamed in 1998 when the association changed its name to the Australian Association of Natural Resource Management. The prize was amended to an annual award of a certificate and a twelve month membership to the NSW Branch of AANRM.

Awarded annually on the recommendation of the Dean of the Faculty of Agriculture to the student in the Faculty of Agriculture who shows greatest proficiency in Soil Science 2 and Crop Science 2, provided the student's work is of sufficient merit.

FL Partridge Prize

Founded in 1928 by a gift of shares from an anonymous donor to establish the 'F.L. Partridge Endowment' in memory of F.L. Partridge. The endowment is used to provide a prize in the Faculty of Agriculture in accordance with the following conditions:

1. The F.L. Partridge Prize shall be awarded to undergraduates in the Faculty of Agriculture who have passed the second year examination in that Faculty.
2. 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.
3. 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.
4. Where there are two or more candidates who fulfil 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.
5. 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.
6. Applications for the F.L. Partridge Prize must reach the Registrar before the end of March in each year.

Poultry Research Foundation Prize in Animal Science

Established in 1977 by an offer from the Poultry Science Research Foundation of an annual donation for a prize in Animal Science with particular reference to Poultry.

Awarded annually in the Faculty of Agriculture on the recommendation of the Sub Dean (Agriculture Teaching) in the Faculty of Veterinary Science to the student enrolled in the fourth year subject Animal Production who achieves the highest proficiency with particular reference to poultry, provided the student's work is of sufficient merit. Value, $400.

Ridley AgriProducts Prize in Animal Nutrition

Established in 2000 by the offer of an annual donation by Ridley AgriProducts to promote closer links with students in the BScAgr degree (and BAnimSc). Awarded annually on the recommendation of the recommendation of the Sub Dean (Agriculture Teaching) in the Faculty of Veterinary Science to the student who is a permanent resident or citizen of Australia and who demonstrates the greatest proficiency in the unit Animal Nutrition 3, provided the work is of sufficient merit. Value $250

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 Head of the Department of Agricultural Chemistry to the most proficient student in fourth year Agricultural Chemistry in the BScAgr degree or the BSc 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.

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 Head of the Department of Agricultural Economics to the student who presents the best essay in the unit of study Applied Marketing, 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 W.L. Waterhouse on his retirement. The money is to be used to establish a prize to perpetuate the name and work of Professor Waterhouse and to continue the prize donated annually by Professor Waterhouse during his tenure of the Research Chair of Plant Pathology and Agricultural Botany.

Awarded annually to the most proficient student in the units of study Agricultural Genetics 2 and Plant Disease 3, 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 Head of the Department of Crop Sciences, after consulting the professor most concerned, to the most proficient student in the second year unit Crop Science 2, 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 Head of the Department of Crop Sciences after consulting the professor most concerned to the most proficient undergraduate student in the area of Weed Science currently assessed in the unit of study Crop Protection, provided that the candidate's work is of sufficient merit. Value, $100.

Sydney Chinese Association Prize

Established in 1969 by a gift of $200 by the Sydney Chinese Association.

Awarded annually on the recommendation of the Professor of Microbiology to the third year student in the Faculty of Science or Agriculture who shows the greatest proficiency in the unit of study (MICR 3001 or 3901) and (MICR 3002 or 3902) Microbiology 3 or MICR 3102 Agricultural Microbiology 3. 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 Head of Department of Crop Sciences to an outstanding student who specialised in the discipline of Plant Pathology within the fourth year of the BScAgr program. Value, $ 100.

ARWoodhill Prize in Entomology

Established in 1966 by the gift of $ 1000 from Mrs Woodhill and the colleagues and students of Dr A.R. Woodhill.

Awarded annually on the recommendation of the Head of the Department of Crop Sciences to the most proficient student in the unit of study Agricultural Entomology 1 offered in the degrees of Bachelor of Animal Science, Bachelor of Science in Agriculture or Bachelor of Horticultural Science 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 Head of the Department of Crop Sciences after consulting academic staff most concerned to the most proficient student in Horticultural Science in Fourth Year, provided that the candidate's work is of sufficient merit, and the second on the recommendation of the Head of the Plant Breeding Institute after consulting academic staff most concerned to the most proficient student in Agricultural Genetics in Fourth Year, provided that the candidate's work is of sufficient merit.

■ Undergraduate scholarships

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 CBScAgr, 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 enrols full time in the Fourth Year of the BAnim Sc or BScAgr degree, 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. Value, $3000.

Commonwealth Bank Group Customer Service Division Scholarship

The Commonwealth Bank Group has offered two-year undergraduate scholarships. The first was awarded in 1996 to a Third Year BAgrEc student. Assuming a high calibre of applicants, there will be a continuum of two current scholarships with a new one commencing each year. The linking of the scholarship to paid vacation employment, between third and fourth year, which can count as professional experience, is a particularly attractive aspect of the scholarships.

This scholarship has been established by the Commonwealth Bank to allow industry to contribute to the tertiary education of students destined for a career in business and finance and with relevance to the agricultural sector. Scholarship holders will attain a more relevant background on completion of their degree, a significant insight into the industry and as a result a jump start in their chosen career path. Customer service in the rural sector is provided through a regional delivery network of Business Banking Centres (BBCs) and Branches in all states. Structured career opportunities are provided in the BBCs for agricultural graduates. Ultimately, scholarship holders could feed directly into the Commercial Banking Graduate Program. It is vital that the successful candidate is interested in a career in commercial lending, specifically relationship management or credit analysis.

Terms and conditions

1. The Commonwealth Bank Group, Customer Service Division, awards the Commonwealth Bank Group (Customer Service Division) Scholarship to a student undertaking the Bachelor of Agricultural Economics degree full-time at The University of Sydney.
2. The Faculty of Agriculture will prepare a short-list of applicants, based on academic performance and relevant criteria for consideration by Commonwealth Bank Group staff.
3. The Scholarship comprises an Award Saver Account to the value of $3,000 per annum to the scholarship holder for the third and fourth years of the degree to assist in the payment of education expenses. The scholarship holder must open an Award Saver Account to receive payment.
4. The scholarship holder must undertake paid vacation employment with Commonwealth Bank Group between the third and fourth academic years with vacation employment commencing after the last examination of the year and extending to the week prior to the beginning of lectures of the ensuing academic year.
5. During vacation employment the scholarship holder will be employed on a contract basis.
6. The scholarship holder will forward semester results to Human Resources, Customer Service Division of the Commonwealth Bank Group as soon as they become available.
7. The Commonwealth Bank Group can revoke the scholarship at any time if the scholarship holder does not maintain a credit average and/or performance is unsatisfactory during vacation employment or if any other situation arises which warrants reconsideration of the award of the scholarship, including a change of enrolment not approved by the Commonwealth Bank Group
8. Upon completion of studies, the scholarship holder is expected to work for Commonwealth Bank Group, Customer Service Division, for a reasonable period of time if a suitable full-time position is identified.
9. The scholarship holder will not accept any other scholarship without obtaining prior permission from the Commonwealth Bank Group.
10. The scholarship holder will not accept employment with a competitor whilst holding the Commonwealth Bank Group Scholarship.

The Australian Cotton Cooperative Research Centre Scholarship

The Australian Cotton CRC has offered two undergraduate scholarships each for two years. The first to be awarded in 2001 to a Third Year BScAgr student and the second to be awarded in 2003.

Terms and conditions

1. The Faculty awards the Scholarship to a third year full-time Bachelor of Science inAgriculture student who is a permanent resident of Australian.
2. The scholarship will be awarded on the basis of the applicant's career aspirations, interpersonal and communication skills, initiative, level of self motivation and academic performance in first and second year. The Faculty of Agriculture will prepare a short-list of University of Sydney applicants, based normally on a minimum WAM of 65 (credit level) in first year and a WAM of 70 in Second and Third years, for joint interview by the Cotton CRC representatives and one or more nominated members of the Faculty of Agriculture. (An applicant who did not have a minimum WAM of 65/70, but who provided evidence that they met all other criteria, would be eligible for short-listing).
3. The scholarship payments shall be made at regular intervals, normally from approximately 1 March to 30 November, subject to continued satisfactory academic progress.
4. The value of the scholarship shall reflect the value of the Faculty of Agriculture Undergraduate scholarship scheme.
5. The scholarship holder will forward semester results to the Cotton CRC Officer as soon as they become available.
6. The scholarship holder will consult with the Faculty prior to selection of any substantial elective component of the coursework.
7. There shall be no bonding or other commitment to employment between the Cotton CRC and a scholar, but the scholarship holder may be encouraged to apply for a Summer Scholarship with the Cotton CRC between the third and fourth academic years. Such work may be credited towards the student's Professional Experience requirements subject to the usual guidelines.
8. A scholarship is intended for continuous progress between third and fourth year.
9. The Faculty of Agriculture reserves the right to revoke the scholarship at any time, following consultation with the Cotton CRC, if the scholarship holder does not maintain the academic standard or if there is a substantive change in enrolment which affects the basis of eligibility.
10. The scholarship holder may be required to relinquish the scholarship, if they accept any other scholarship valued at $3000 or above without prior permission from the Faculty and the Cotton CRC. Faculty of Agriculture Undergraduate Scholarship holders are not eligible to apply.

The Elders Agronomy Scholarship

(Suspended in 2002)

Elders Ltd has offered two-year undergraduate scholarships. The first was awarded in 1996. Assuming a high calibre of applicants, there could be a continuum of two current scholarships with a new one commencing each year. The linking of the scholarship to paid vacation employment, which can count as professional experience, is a particularly attractive aspect of the scholarships.

Terms and conditions

1. Elders Ltd awards the Elders Agronomy Scholarship to a third year full-time Bachelor of Science in Agriculture or Bachelor of Horticultural Science student. The scholarship will be shared on a competitive basis with the University of New England, normally with one scholarship between the two Universities each year.
2. The scholarship will be awarded on the basis of the applicant's career aspirations, interpersonal and communication skills, initiative, level of self motivation and academic performance in first and second year. The Faculty of Agriculture will prepare a short-list of applicants, based normally on a minimum WAM of 65 (credit level), for joint interview by Elders staff and one or more nominated members of the Faculty of Agriculture. (An applicant who did not have a minimum WAM of 65, but who provided evidence that they met all other criteria, would be eligible for short-listing).
3. The scholarship comprises four payments of $1500 payable at the beginning and middle of the scholarship holder's third and fourth years of study (April and September).
4. The scholarship holder will forward semester results to Elders NSW Merchandise Manager as soon as they become available.
5. The scholarship holder will consult with the Faculty and the Elders NSW Merchandise Manager prior to selection of any substantial elective component of the coursework.
6. The scholarship holder must undertake paid vacation employment with Elders Ltd between the second and third (4 weeks) and the third and fourth (8 weeks) academic years.
7. During vacation employment the scholarship holder will be employed as a full-time staff member of Elders Ltd, at a location selected by the company following consultation with the scholarship holder.
8. The Faculty and Elders Ltd expect the scholarship holder to undertake limited extracurricular activities and training, particularly, viz. public speaking and presentation skills, a significant collection of common crop weeds, developing a network of referees and Agsafe accreditation.
9. Elders Ltd reserves the right to revoke the scholarship at any time, following consultation with the Faculty of Agriculture, if the scholarship holder does not maintain a credit average and/or performance is unsatisfactory during vacation employment or if there is a substantive change in enrolment which affects the basis of eligibility.
10. The scholarship holder will not accept any other scholarship without prior permission from the Faculty and Elders Ltd.
11. Upon completion of studies the scholarship holder is expected to work for Elders Ltd for a reasonable period of time if a suitable full-time position is identified.

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 subjects in Third or Fourth years of the Bachelor of Science in Agriculture degree or the Bachelor of Animal Science degree 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 Agriculture, Food and Natural Resources. A total of $1,000 is available annually.

Native Cockroach Research Scholarship

Established by Dr H A Rose in 1996 for Entomology research to encourage and assist students interested in Australian native cockroaches. The scholarship will be awarded on the basis of the applicant's career aspirations, written communication skills, initiative, level of self motivation, commitment to the area and academic performance.

A candidate is expected to:

- Enrol full-time in the Fourth Year of the BScAgr degree.
- Specialise in Agricultural Entomology 4.
- Undertake his/her project (16 or 24 credit points) on some aspect of the biology of native cockroaches.
- normally have completed the first three years in minimum time, have a minimum Second/Third year WAM of 65 (credit level) and be strong enough academically to complete the degree over the four year period. (An applicant who did not have a minimum WAM of 65, but met all other criteria, would be eligible for consideration.)

An interview will be conducted, if necessary, for ranking.

Oasis Horticulture Pty Ltd Scholarship in Horticulture

Oasis Horticulture has offered two-year undergraduate scholarships. The first was awarded in 1998. Assuming a high calibre of applicants, it is envisaged that there would be a new scholarship commencing each year. The linking of the scholarship to paid vacation employment, which can count as professional experience, is a particularly attractive aspect of the scholarship.

Oasis Horticulture Pty Ltd, situated at Winmalee in the foothills of the Blue Mountains, is one of Australia's largest wholesale nurseries. The company is well known for Flower and Vegetable seedlings as well as potted lines. Oasis Horticulture has an intensive Research and Development Department. Its Propagation Department is responsible for the vegetative propagation of several million young plants annually.

Terms and conditions

1. The Faculty of Agriculture awards the Oasis Horticulture Pty Ltd Scholarship in Horticulture to a third year full-time Bachelor of Horticultural Science or Bachelor of Science in Agriculture student of The University of Sydney.
2. The scholarship will be awarded on the basis of the applicant's demonstrated commitment to horticulture, career aspirations, interpersonal and communication skills, initiative, level of self motivation and academic performance

in the first three semesters of enrolment. The Faculty of Agriculture will prepare a short-list of applicants, based normally on a minimum WAM of 65 (credit level), for joint interview by Oasis Horticulture representatives and one or more nominated members of the Faculty of Agriculture. (Applicants who do not have a minimum WAM of 65, but who provided evidence that they meet all other criteria, will be eligible for short-listing).

3. The scholarship comprises four payments of $ 1,500 payable at the beginning and middle of the scholarship holder's third and fourth years of study (March and September).
4. The scholarship holder will forward semester results to Oasis Horticulture as soon as they become available.
5. The scholarship holder will consult with the Faculty and Oasis Horticulture prior to selection of any substantial elective component of the coursework.
6. The scholarship holder must undertake paid vacation employment with Oasis Horticulture between the second and third (4-8 weeks) and the third and fourth (4-8 weeks) academic years or 8-16 weeks at some vacation time mutually agreeable to Oasis Horticulture and the student.
7. During vacation employment the scholarship holder will be employed as a full-time staff member of Oasis Horticulture, at a location selected by the company following consultation with the scholarship holder.
8. The Faculty and Oasis Horticulture expect the scholarship holder to undertake limited extracurricular activities and training, particularly public speaking and presentation skills, and develop a network of contacts in the horticultural industry and in particular in the nursery and related sectors.
9. The Faculty reserves the right to revoke the scholarship at any time, following consultation with Oasis Horticulture, if the scholarship holder does not maintain a credit average and/or performance is unsatisfactory during vacation employment or if there is a substantive change in enrolment which affects the basis of eligibility.
10. The scholarship holder will not accept any other scholarship without prior permission from the Faculty and Oasis Horticulture.

NSW Farmers' Association Tertiary Scholarships

You may apply direct to the Association for one of five competitive scholarships available across the State.

A candidate is expected to:

- Have been a full member of the New South Wales Farmers' Association during 2000 and 2001, or have a parent/partner who holds such membership
- Provide information on tertiary academic standards
- Enrol full-time in the 2 nd, 3 rd or 4 th year of a bachelor degree in 2002
- Demonstrated commitment to agricultural/rural communities.

Application forms from the Association at Membership Services on (02) 9251 1700, fax (02) 9221 6913.

Value: in 2002 is $5,000.

Trinity Grammar School Teaching Internship

[Suspended for 2002]

Established by Trinity Grammar School in 1997 as a contribution from Independent Education to Tertiary Education to assist high calibre students in pursuing a career as a Secondary Teacher with the School.

A candidate would be expected to:

- Enrol full-time in the Fourth Year of the BScAgr or BSc degree.
- Normally have completed First, Second and Third year in minimum time with a minimum WAM of 65 (credit level) and be strong enough academically to complete the degree over a four year period
- demonstrate evidence of integrity of character, diligence and leadership qualities
- be actively involved in the School's Teaching Internship program, sporting and co-curricular activities
- provide evidence of relevant career goals.

An interview of short-listed candidates is part of the selection process.

Application forms from Trinity Grammar School, Summer Hill ph 02 9581 6000 or the Faculty Offices.

Value: $3,000.

■ Undergraduate scholarships in Agriculture

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 Animal Science, Bachelor of Horticultural Science, Bachelor of Land and Water Science or Bachelor, Resource Economics or Bachelor of Science in Agriculture.

The scholarship shall be awarded under the following conditions:

1. Each scholarship shall be named an Undergraduate Scholarship in Agriculture, except where a 'cooperating company' requests that its name be used as an identifier within the scheme.
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 at The University of Sydney.

Tenure

3. (a) Each scholarship shall be tenable for the specific agricultural degree for which it is offered, where applicable, and shall not be transferable to the other degree except in exceptional circumstances.
(b)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.

Advisory committee

4. (a) There shall be an Advisory Committee consisting of the following persons:
(i) no fewer than five representatives of separate cooperating companies;
(ii) no fewer than two heads of departments in the Faculty of Agriculture including the Head of the Department of Agricultural Economics (or their nominees);
(iii) no more than three members of the Institute of Advanced Studies within the Faculty of Agriculture;
(iv) the Dean of the Faculty of Agriculture; and
(v) the Executive Director of the Undergraduate Scholarships in Agriculture Program.
(b) The Advisory Committee shall elect its own chairperson.
(c) The Advisory Committee shall advise the Faculty on the conduct and management of the program, including scholar selection, the nature and organisation of the industrial experience component, and such other matters as it consider pertinent to the effective operation of the program.
(d)The Executive Director of the program shall be a member of the Faculty, nominated by the Dean, appointed by the Advisory Committee.
(e) 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.

Annual meeting of cooperating companies

5. There shall be an annual general meeting of cooperating companies during the first semester of each academic year, when:
(a) the Advisory Committee shall report on the operation of the program over the previous year;
(b) the membership of the Advisory Committee for the coming year shall be determined; and
(c) any matters relating to the program may be raised and decisions thereon made for implementation by the Advisory Committee.

Awarding of the scholarships

6. (a) 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.
(b)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.
7. There shall be no bonding or other commitment to employment between a cooperating company and any scholar.
8. 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 degrees for some exceptional purpose, and, if such request is approved, the scholarship shall be suspended during such interruption.

Cost

9. (a) 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.
(b) Transfers of funds from cooperating companies to the University shall be made by 31 January in the year to which the scholarship place applies.
(c) The administrative levy will be reviewed each year.

Benefits to cooperating companies

lO.Each current cooperating company shall be entitled to:
(a) access to the whole pool of Undergraduate Scholars in Agriculture for professional work experience in the cohort or cohorts contemporaneous with the year or years of its support; and
(b)inclusion of the company's name on a roll of cooperating companies to be set up in the Faculty Office.

Value and payments

11. (a) The value of the scholarship stipend in 2002 shall be $6500 per annum.
(b)The value of the scholarship stipend shall be adjusted annually by the Advisory Committee after considering movements in the consumer price index.
(c) A scholarship shall run from 1 March to the following 30 November.
(d)The scholarship payments shall be made at regular intervals.

■ Facilities, organisations and student societies

Macintosh Computer Laboratory

This computer laboratory is located in the RD Watt Building. It may be used by arrangement with the Head of the Department of Agricultural Economics (or nominee) by undergraduate and postgraduate students enrolled in the Faculty of Agriculture.

Ross Street Computer Laboratory

This PC computer laboratory is located in the Ross Street Building. It may be used by arrangement with Associate Professor M.E. O'Neill (or nominee) by undergraduate and postgraduate students enrolled in the Faculty of Agriculture.

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 on 2nd 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.

Libraries

University of Sydney Library

Web: www.library.usyd.edu.au

The University of Sydney Library is the largest academic library in the Southern Hemisphere. It is made up of network of 24 Libraries. The specialist libraries for research in Agriculture are:
Badham Library: www.library.usyd.edu.au/libraries/badham/
Camden Library: www.library.usyd.edu.au/libraries/camden/
Orange Library: www.library.usyd.edu.au/libraries/orange/

Your student card will allow you to borrow from any of the Libraries in the system. Location maps for these Libraries, opening hours and contacts are listed at the URLs above.

Many of the other Libraries will have information of interest to you too. Please check the Library Website for a complete list of Libraries, www.library.usyd.edu.au.

The Library provides access to services including the Library catalogue (see opac.library.usyd.edu.au) and a range of databases, used to find references to journal articles (see www.library.usyd.edu.au/databases/.)

It is possible to access many of these databases from outside campus, please check www.library.usyd.edu.au/databases/ wam.html for more information, or contact your Faculty Liaison Librarian.

For more information and pointers to great information sources check out the:
Agriculture Subject Guide
Web: www.library.usyd.edu.au/subjects/agriculture/
Veterinary Education and Information Network (VEIN)
Web: www.library.usyd.edu.au/VEIN/
for animal science information.

Your Faculty Liaison Librarian

Information specialists are available to assist you with your information needs.
Camden campus
Janine Maitland
Email: j.maitland@library.usyd.edu.au
Phone: (02)9351 1627
Fax: (02) 4655 6719
Camperdown campus
Philippa Stevens
Email: p.stevens@library.usyd.edu.au
Phone: (02) 9351 3775
Fax: (02) 9351 3852
Narrabri campus
David Woodside
Email: david.woodside@orange.usyd.edu.au
Phone: (02) 6360 5639
Fax: (02) 6792 3276

In the absence of any of the above people please contact:
Su Hanfiing
Email: s.hanfling@library.usyd.edu.au
Phone: (02) 9351 5426
Fax: (02) 9351 3852

Mathematics Learning Centre Lecturer-in-charge Jacqueline M Nicholas

The Mathematics Learning Centre offers help to 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, courses 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 and throughout the year.

The Centre is on the fourth floor of the Carslaw Building, Room 455. Any student seeking assistance should call at the Centre, or phone (02) 93514061.

Faculty societies

The Sydney University Agricultural Society

AgSoc is an association for the undergraduates of the Faculty of Agriculture, 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 will be 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 dinner-dance, as well as numerous harbour cruises, barbecues, activity weekends and other informal occasions.

Membership of many 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 2002 Committee encourages all members of the Faculty to become involved.

Sydney University Agricultural Graduates' Association

The Sydney University Agricultural Graduates' Association (SUAGA) is a graduate society. All graduates of the Faculty of Agriculture, 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 of Agriculture.

Plant Breeding Institute within the Faculty of Agriculture, Food and Natural Resources

1. (l)There shall be an institute to be known as the Plant Breeding Institute within the Faculty.
   (2) The Institute shall advise the University on the promotion of the science of plant breeding and improvement in the genotypes of crop plants available for commercial cultivation.
2. (l)The governing body of the Institute shall be a Council comprising -
   (a) the Vice-Chancellor and Principal, the Dean of the Faculty of Agriculture, Food and Natural Resources and the Professor of Plant Breeding or their nominees;
   (b)the New South Wales Minister for Agriculture or the Minister's representative;
   (c) not more than six trustees of the New South Wales Wheat Research Foundation appointed by the Senate on the recommendation of the Foundation;
   (d) not more than four members of the full-time staff of the University appointed by the Dean on the recommendation of the Faculty.
   (2) Each member shall hold office for a period of three years and shall be eligible for reappointment.
3. (l)The Council shall elect annually from amongst its members an honorary Chairperson.
   (2) All questions which come before the Council shall be decided at any meeting duly convened, at which a quorum is present, by a majority of the votes of the members present.
   (3) The Chairperson at any such meeting shall have one vote.
   (4) At any such meeting eight members shall form a quorum.
4. (l)The Professor of Plant Breeding shall be honorary Director of the Institute, provided that during any vacancy in the Chair of Plant Breeding, the Vice-Chancellor, after consulting the Dean and principal research leaders at Narrabri and Cobbitty, may appoint an honorary Acting Director for a period not exceeding 6 months.
   (2) The Director or Acting Director shall be responsible for administering the following -
   (a) the buildings, equipment, land and staff located at the IA Watson Grains Research Centre, Narrabri;
   (b)the buildings, equipment, land and staff involved in plant breeding research at the Plant Breeding Institute, Cobbitty.
   (3) The staff of the Institute shall carry out their duties under the direction of the Director or Acting Director.
5. The Director or Acting Director shall report to the Council annually and shall include an annual budget for the ensuing year.
6. (l)The Council and its officers shall have such other powers, duties and functions as may be prescribed by resolution of the Senate provided that all acts of the Council and its officers shall be subject to the by-laws and to any direction which may be given by the Senate.
   (2) The Senate shall provide such administrative, technical and secretarial assistance as it considers proper for the Institute.

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. (i) 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.
   (ii) The Institute shall promote the attraction of additional income.
3. (i) The Institute shall further the development of postgraduate studies and research in the Faculty.
   (ii) 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. (i) One director of the Institute from each department shall be appointed by the Faculty from the full-time permanent members of the Departments of Agricultural Chemistry and Soil Science, Agricultural Economics, Animal Science, Crop Sciences, Microbiology and the Plant Breeding Institute.
   (ii) The Dean and the Associate Dean (Postgraduate Studies) of the Faculty shall be ex officio directors.
   (iii) Directors shall be appointed biennially at the November meeting of the Faculty in the year in which a term ends. For 1994 and every fourth year thereafter, there shall be one director appointed from each of the Departments of Animal Science, Microbiology and the Plant Breeding Institute. For 1996 and every fourth year thereafter there shall be one director appointed from each of the Departments of Agricultural Chemistry and Soil Science, Agricultural Economics and Crop Sciences.
   (iv) Directors shall be eligible for re-appointment.
   (v) A casual vacancy in the office of Director shall be filled by the Faculty from the department concerned and the director so appointed shall hold office for the remainder of the term of the person being replaced.
   (vi) The office of a director who is unable to attend meetings for six months or more shall be declared vacant; a replacement appointment for director from the department concerned shall be required for the remainder of the term.
6. (i) The directors shall elect from amongst their number a Chair of the Institute.
   (ii) The election of the Chair shall be held at the first meeting of the Institute after 1 January following the biennial appointment of directors and the Chair so elected shall hold office from the time of the election until a successor is elected.
   (iii) The Chair shall be eligible for re-election.
   (iv) A casual vacancy in the Chair shall be filled by a like method of election of a duly convened meeting of the Institute to be held as soon as conveniently may be and the Chair so elected shall hold office for the remainder of the term of the person replaced.
7. The directors shall submit recommendations for postgraduate activities to the Faculty for consideration and recommendation to Senate for approval.

8 Regulations

■ Resolutions of the Senate

Constitution of The Faculty of Agriculture, Food and Natural Resources

1. The Faculty of Agriculture, Food and Natural Resources shall comprise the following persons:
   (a) the Professors, Readers, Associate Professors, Senior Lecturers, Lecturers and Associate Lecturers, being full-time and fractional permanent or full-time and fractional temporary members of the teaching staff in the Department of Agricultural and Resource Economics, and the School of Land, Water and Crop Sciences;
   (b)the Deans of the Faculties of Veterinary Science, Science, Economics and Business, Rural Management, Arts, and Law;
   (c) nominees of the respective Deans of Veterinary Science, Science, and Economics and Business should be members of the academic staff in relevant areas of undergraduate and postgraduate teaching; the numbers of members so nominated to be seven (7) for Veterinary Science, six (6) for Science, and six (6) for Economics and Business;
   (d)fhe Director of the IA Watson Grains Research Centre;
   (e) the Director of the Australian Centre for Agricultural Health and Safety;
   (f) not more than three persons distinguished in the field of agriculture appointed by the Senate on the nomination of the Dean of the Faculty with the approval of the Faculty;
   (g)not more than four students elected in the manner prescribed by resolution of the Senate; and
   (h)such other persons, if any, being full-time members of the research staff assigned to a department/school or unit in the Faculty and holding a position at the level of Research Fellow and above, after they have been employed in the Faculty for more than three years.
2. (a) A person appointed pursuant to section 1(f) shall be appointed for a period of three years and shall be eligible for reappointment for one period of three years.
   (b)The persons, if any, appointed under section 1(h) shall be members of the Faculty for so long as they remain full-time members of the senior research staff in the Faculty.

Degrees and Diplomas in the Faculty of Agriculture, Food and Natural Resources

1. The degrees in the Faculty of Agriculture, Food and Natural Resources shall be:
   (a) B achelor of S cience in Agriculture (B S c Agr)
   (b)Bachelor of Animal Science (BAnimSc)
   (c) Bachelor of Agricultural Economics (BAgrEc)
   (d)Bachelor of Horticultural Science (BHortSc)
   (e) Bachelor of Land and Water Science (BLWSc)
   (f) Bachelor of Resource Economics (BResEc)
   (g) Master of Agriculture (MAgr)
   (h) APEC Master of Sustainable Development (APEC MSDevel)
   (i) Master of Science in Agriculture (MScAgr)
   (j) Master of Agricultural Economics (MAgrEc)
   (k) Doctor of Philosophy (PhD)
   (l) Doctor of Science in Agriculture (DScAgr)
   (m)Doctor of Agricultural Economics (DAgrEc).
2. The diplomas in the Faculty of Agriculture shall be:
   (a) Graduate Diploma in Agricultural Economics (GradDipAgrEc)
   (b) Graduate Diploma in Agricultural Science (GradDipAgrSc).

Bachelor degrees in the Faculty of Agriculture, Food and Natural Resources

These Resolutions must be read in conjunction with the University of Sydney (Undergraduate Courses) Rule 1999, which set out the requirements for all undergraduate degree courses, and with the relevant Faculty Resolutions.

Bachelor degrees in the Faculty of Agriculture, Food and Natural Resources

Bachelor of Agricultural Economics
Bachelor of Animal Science
Bachelor of Horticultural Science
Bachelor of Land and Water Science
Bachelor of Resource Economics
Bachelor of Science in Agriculture

Requirements for the degree at Pass level

2. To qualify for the award of the degree at pass level students must:
   complete successfully units of study giving credit for a total of 192 credit points; and
   satisfy the requirements of all other By-Laws, Rules and Resolutions of the University.

Requirements for the degree at Honours level

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.

(See Resolutions of the Faculty relating to the Bachelor degrees in the Faculty of Agriculture, Food and Natural Resources in this section, following the Postgraduate Resolutions.)

■ Master of Science in Agriculture Master of Agricultural Economics Master of Agriculture

1. A candidate for the degree of Master of Science in Agriculture or for the degree of Master of Agricultural Economics shall proceed by research and submission of a thesis and a candidate for the degree of Master of Agriculture shall proceed by coursework.
2. (1) A candidate for the degree of Master of Science in Agriculture shall proceed to the degree in the School of Land, Water and Crop Sciences
   (2) A candidate for the degree of Master of Agricultural Economics shall proceed in the Department of Agricultural and Resource Economics.
   (3) A candidate for the degree of Master of Agriculture shall proceed in the Department/School in the Faculty or in an interdisciplinary program approved by the Faculty.

Admission to candidature

3. (1)The Faculty of Agriculture, Food and Natural Resources may admit to candidature for the degree of Master in the Faculty a graduate of The University of Sydney who has completed units of study acceptable to the Faculty.
   (2) On the recommendation of the Faculty, the Academic Board may admit to candidature in accordance with chapter 10 of the by-laws a person who has, in the opinion of the Faculty, qualifications equivalent to those required of a graduate of The University of Sydney.
4. The Faculty may require a person admitted as a candidate for the degree of Master of Science in Agriculture or the degree of Master of Agricultural Economics to serve a period of probation for not more than one year and to complete such work during the period as it may prescribe, and at the completion of the period, the Faculty shall review the candidature and the work completed, and may confirm or terminate the candidature. If the Faculty confirms the candidature, it shall be deemed to have commenced at the beginning of the period of probation.

Periods of candidature

5. (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 shall be two years, 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 shall be one year.
(2)The period of candidature for a full-time candidate for the degree of Master of Agriculture shall be one year.
(3) The maximum period of full-time candidature for the degree of Master of Science in Agriculture or the degree of Master of Agricultural Economics shall be three years, but the Faculty may, in special circumstances, extend a candidature.
(4) The Faculty shall determine the minimum and maximum periods of candidature for part-time candidates on a pro-rata basis.
(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 S cience 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.

Appointment of supervisor

6. The Faculty shall appoint a member of the full-time academic or research staff of the Department/School in which a candidate for the degree of Master of Science in Agriculture or the degree of Master of Agricultural Economics is proceeding to be the candidate's supervisor. The Faculty may also appoint an associate supervisor 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.

Coursework to be completed

7. A candidate proceeding by coursework shall complete units of study prescribed by the Faculty to a total value of 48 credit points from units of study approved from time to time by the Faculty.

Progress

8. (l)Each candidate shall report regularly to the Faculty on his or her progress towards completing the requirements for the degree.
(2) The Faculty shall 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.
(3)The Faculty may accept a candidate's results in coursework examinations in place of reports from the candidate.

Lodgement of thesis

9. (l)Not earlier than the end of the minimum period of candidature, each candidate proceeding by research and thesis shall lodge with the Registrar three copies of a thesis embodying the results of an original investigation carried out by the candidate.
(2) The candidate shall 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.
(3) The thesis shall 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.

Examination

lO.The Faculty shall appoint at least two examiners for a thesis, one of whom shall be external to the University.

Result of candidature

11. The Faculty shall determine the result of the candidature after it has considered:
(a) the reports of the examiners of the thesis or the results of the examinations completed by a candidate proceeding by coursework, and
(b) a recommendation on the result of the candidature from the Head of the Department/School in which the candidate is proceeding.

Award of the degree

12.The degree of Master of Agriculture may be awarded in the following subject areas and the testamur for the degree shall specify the subject area:
(a) Agricultural Chemistry
(b) Agricultural Economics
(c) Agricultural Entomology
(d) Agricultural Genetics
(e) Agronomy
(f) Animal Science
(g) Biometry
(h) Cereal Chemistry
(i) Cereal Science
(j) Horticultural Science
(k) Microbiology
(l) Plant Breeding
(m)Plant Pathology
(n) Plant Protection
(o)Soil Conservation
(p)Soil Contamination
(q) Soil Science
(r) Turf Management.

■ APEC Master of Sustainable Development

1. A candidate for the APEC Master of Sustainable Development shall proceed by coursework.
2. A candidate for the degree of APEC Master of Sustainable Development shall proceed to the degree in the Faculty of Agriculture, Food and Natural Resources at The University of Sydney.

Admission to candidature

3. (l)The Faculty of Agriculture, Food and Natural Resources may admit to candidature for the degree of APEC Master of Sustainable Development a graduate of The University of Sydney who has completed a course acceptable to the Faculty.
(2) On the recommendation of the Faculty, the Academic Board may admit to candidature in accordance with chapter 10 of the by-laws a person who has, in the opinion of the Faculty, qualifications equivalent to those of a graduate of The University of Sydney.

Periods of candidature

4. (l)The period of candidature for a full-time candidate for the degree of APEC Master of Sustainable Development shall be one year.
(2) The Faculty shall determine the minimum and maximum periods of candidature for part-time candidates on a pro-rata basis.
(3) The Faculty may deem time spent on coursework completed for another degree or diploma of The University of Sydney to be time spent or coursework completed for the degree of APEC Master of Sustainable Development in the Faculty if the candidate has ceased to be a candidate for the other degree or diploma, and the Faculty may reduce the minimum and maximum periods of candidature accordingly.

Appointment of a supervisor

5. The Faculty, on the recommendation of the Program Director, shall appoint a member of the full-time academic staff of the con-joint participating organisations as supervisor for the Research Project within the course.

Coursework to be completed

6. A candidate proceeding by coursework shall complete units of study prescribed by the Faculty to a total value of 48 credit points from units approved from time to time by the Faculty.

Progress

7. (l)Each candidate shall report regularly to the Faculty, through the Program Director, on his or her progress towards completing the requirements for the degree.
(2) The Faculty shall consider the report of each candidate and may, if it considers that a candidate has not made satisfactory progress toward completing the requirements for the degree, terminate the candidature.
(3) The Faculty may accept a candidate's results in coursework examinations in place of the reports from the candidate.

Result of candidature

8. The Faculty shall determine the result of candidature after it has considered:
(a) the results of examinations completed by a candidate
(b) a recommendation on the result from the Program Director.

Award of the degree

9. The testamur for the degree shall specify APEC Master of Sustainable Development.

■ Graduate Diplomas

1. Candidates for the graduate diplomas shall proceed by coursework.
2. (1) A candidate for the Graduate Diploma in Agricultural Science shall proceed in the School of Land, Water and Crop Sciences.
   (2) A candidate for the Graduate Diploma in Agricultural Economics shall proceed in the Department of Agricultural and Resource Economics.

Admission to candidature

3. (1) The Faculty of Agriculture, Food and Natural Resources may admit to candidature for a graduate diploma in the Faculty a graduate of the University of Sydney who has completed units of study acceptable to the Faculty.
   (2) On the recommendation of the Faculty, the Academic Board may admit to candidature in accordance with Chapter 10 of the by-laws a person who has, in the opinion of the Faculty, qualifications equivalent to those required of a graduate of the University of Sydney.
4. The Faculty may require a person admitted to candidature to serve a period of probation for not more than one year and to complete such work during the period as it may prescribe, and at the completion of the period, the Faculty shall review the candidature and the work completed, and may confirm or terminate the candidature. If the Faculty confirms the candidature, it shall be deemed to have commenced at the beginning of the period of probation.

Periods of candidature

5. (1) The period of candidature for a full-time candidate for a graduate diploma shall be one year.
   (2) The Faculty shall determine the minimum and maximum periods of candidature for part-time candidates on a pro-rata basis.
   (3) The Faculty may deem time spent or coursework completed for a degree or another diploma of the University of Sydney to be time spent or coursework completed for a diploma in the Faculty if the candidate has ceased to be a candidate for the degree or the other diploma, and the Faculty may reduce the period of candidature accordingly.

Progress

6. (1) Each candidate shall report regularly to the Faculty on his or her progress towards completing the requirements for the graduate diploma.
   (2) The Faculty shall 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 graduate diploma, terminate the candidature.
   (3) The Faculty may accept a candidate's results in coursework examinations in place of reports from the candidate.

Result of candidature

1. The Faculty shall determine the result of the candidature after it has considered -
   (a) the results of the examinations completed by a candidate, and
   (b) a recommendation on the result of the candidature from the Head of the Department/School in which the candidate is proceeding.

Award of the graduate diploma

8. The Graduate Diploma in Agricultural Science shall be awarded in the following subject areas and the testamur for the diploma shall specify the subject area:
   (a) Agricultural Chemistry
   (b) Agricultural Entomology
   (c) Agricultural Genetics
   (d) Agronomy
   (e) Animal Science
   (f) Biometry
   (g) Horticultural Science
   (h) Microbiology
   (i) Plant Pathology
   Q) Plant Protection
   (k) Soil Science
   (l) Turf Management.

■ Resolutions of the Faculty - Postgraduate Candidatures

Eligibility for admission

1. An applicant for admission to candidature for a research degree shall -
   (a) hold a degree of Bachelor of the Faculty with First or Second Class Honours or equivalent of the University of Sydney; or
   (b) for the Master of Agricultural Economics or Master of Science in Agriculture, hold a degree of Bachelor of the Faculty with a Credit or above in the Fourth Year in the field in which the candidate is proceeding; or
   (c) have completed courses in another faculty or institution, these courses being deemed by the Faculty to be equivalent.
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.
3. A research topic, which is satisfactory in terms of research interests, resources and availability of supervision within the department, must be agreed upon between the applicant and the relevant department.
4. An applicant for admission to candidature for the degree of Master of Agriculture by coursework or the Graduate Diploma in Agricultural Economics or the Graduate Diploma in Agricultural Science, both by coursework, shall have a bachelor's degree of the University of Sydney, or equivalent, and have demonstrated an adequate ability for the subject area to be studied.
5. Applicants may be required to provide evidence of adequate financial resources for personal support and compulsory fees during candidature. They may be required to demonstrate to the satisfaction of the Faculty a proficiency in the English language adequate to undertake the proposed candidature.

Availability

6. The number of students admitted may be limited and will be determined by -
   (a) availability of resources, including space, library, equipment and computing facilities, and
   (b) availability of adequate and appropriate supervision, including both the supervision of research candidatures and where appropriate the coordination of coursework programs.
7. 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 sections 1-4 above.

Control of candidature

8. (i) Each candidate for the MAgrEc or MScAgr degree shall pursue his or her course of advanced study and research wholly under the control of the Faculty.
   (ii) 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.

Part-time candidature by research

9. (i) 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 departmental and faculty activities as are required by the Head of the Department/School.
   (ii) The Faculty may permit part-time candidates for the MAgrEc or the MScAgr degree admitted under the provisions of Chapter 10 of the by-laws to complete the investigation elsewhere, after two years have been spent in this or equivalent candidature within the University.
   (iii) Candidates admitted to part-time candidature are expected to devote a minimum of 20 hours per week (or equivalent) to their candidature.
   (iv) Research assistants or associate lecturers in the University shall enrol part-time unless they can demonstrate to the satisfaction of the Faculty that they have sufficient time to pursue full-time candidature.

Coursework to be completed

10. A candidate proceeding by coursework shall satisfactorily complete such coursework as the Faculty on the advice of the Head of the Department/School may prescribe. Coursework, including any prescribed research project, will be chosen

from the tables of units of study attached to these resolutions. A result of PCON may not be counted towards the award of a degree or the graduate diploma.
(a) For the MAgr degree, 48 credit points of coursework must be completed including 8 to 24 credit points of any prescribed research project.
(b)For the GradDipAgrEc, 48 credit points of coursework must be completed including 8 or 16 credit points of any prescribed research project.
(c) For the GradDipAgrSc, 48 credit points of coursework must be completed including 8 to 24 credit points of a research project.

***Credit for previous** studies*

11.The Board of Postgraduate Studies (Board) may grant credit:
(a) towards MAgr candidature for coursework completed in graduate diploma candidature in this Faculty;
(b)for up to 12 credit points of unspecified coursework towards MAgr candidature for units of study completed in another faculty of this University or of other tertiary institutions;
(c) forup to 8 credit points of unspecified coursework towards graduate diploma candidature for units of study completed in another faculty of this University or of other tertiary institutions; provided that:
(i) no unit of study for which credit is granted has been a basis for the award of any other degree or diploma;
(ii) 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;
(iii) the unit or units were completed within six years immediately preceding the commencement of candidature for the MAgr degree or the graduate diploma.

Form of a thesis

12.(1) A thesis may be bound for submission in either a temporary or a permanent form.
(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.
(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.
(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.
(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.
(6) If emendations are required, all copies of a thesis which are to remain available within the University must be emended.

Result of candidature

13.(l)The Board of Postgraduate Studies awards, or for the PhD degree recommends the award of, the degree or graduate diploma whenever:
(a) the examiners have recommended without reservation that the degree be awarded and the Head of the Department/School concurs; or
(b) 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 Head of the Department/School concurs 1; or
(c) the Board of Postgraduate Studies unanimously accepts a recommendation from the Head of the Department/ School to award or award subject to emendations despite reservations expressed by one or more of the examiners; or
(d)the coursework results are satisfactory and the Head of the Department/School recommends the award of the degree or graduate diploma.
(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 Head of the Department/School has so recommended.

Satisfactory progress

14.(1) A candidate proceeding by research and thesis shall lodge a progress report annually with the Registrar.
(2) The Board of Postgraduate Studies may require a candidate proceeding by coursework to show good cause why he or she should be allowed to re-enrol in a unit of study which has been twice failed or discontinued to count as failure.

Preliminary requirements

15.When an applicant is not qualified for admission to a Master's degree by research, the Faculty may require satisfactory completion of a preliminary examination before admission to candidature can be granted. In such a case a candidate may be enrolled in a Master's Preliminary program which shall consist of such coursework or other requirements as the Faculty may determine.

Delegation

16.1n these resolutions -
(1) Faculty delegates its responsibility to the Board of Postgraduate Studies.
(2) The Board of Postgraduate Studies delegates the following responsibilities to the Dean who in turn delegates them to the Associate Dean (Postgraduate Studies): approval of:
(a) award of the degree of Doctor of Philosophy under conditions approved by the University's Committee for Graduate Studies
(b) award of the Master of Agriculture degree and the Graduate Diplomas in Agricultural Science and Agricultural Economics
(c) award of the Master of Science in Agriculture and Master of Agricultural Economics degrees when there is no apparent reason for debate at the Board
(d) appointment of examiners
(e) admission to candidature
(f) supervisory arrangements
(g) variation of candidature
(h) extension of candidature
(i) completion of candidature away from the University
(j) suspension of candidature
(k) approval of continuance following receipt of annual progress reports.

Completion of course

Except by permission of the Dean, no student shall be allowed to sit for any examination unless the requirements specified by the Faculty have been completed. 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. Students who fail to show sufficient cause are excluded from admission to examinations. No excuse for absence from lectures, demonstration or practical work shall be received unless tendered in writing to the Departmental/School Office within one week after attendance is resumed.

■ Faculty Resolutions for APEC MSDevel

*Eligibility **for** admission*

1. An applicant for admission to candidature for the degree of APEC Master of Sustainable Development by coursework, shall have a bachelor's degree of The University of Sydney, or equivalent, and have demonstrated an adequate ability for the subject area to be studied.
2. Applicants may be required to provide evidence of adequate financial resources for personal support and compulsory fees during candidature. They may be required to demonstrate to the satisfaction of the Faculty a proficiency in the English language adequate to undertake the proposed candidature (IELTS 7.0 as a minimum, or equivalent qualifications).
3. The number of students admitted may be limited and will be determined by:
(a) availability of resources, including space, library, equipment and computing facilities, and
(b) availability of adequate and appropriate supervision, including both the supervision of project work and the coordination of coursework programs.
4. 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 sections 1-2 above.

Control of candidature

5. Each candidate for the degree shall pursue his or her course under the control of the Faculty.

Part-time candidature

6. The Faculty may permit candidates to enrol in part-time candidature provide they supply a satisfactory detailed plan of their proposed program and attend at the University for such consultation with the supervisor and participate in University activities as required by the Program Director.

Coursework to be completed

7. A candidate proceeding by coursework shall satisfactorily complete such units of study as the Faculty on the advice of the Program Director may prescribe after consultation with the relevant coordinators in the con-joint institutions. Units of study, including a research project will be chosen from the tables of units attached to these resolutions.

   For the APEC Master of Sustainable Development, units totalling 48 credit points must be completed including 20 credit points of the prescribed research project.

Credit for previous studies

8. The Board of Postgraduate Studies (Board) may grant credit for up to 12 credit points of unspecified coursework towards APEC Master of Sustainable Development candidature for units of study completed in another faculty of The University of Sydney or of other tertiary institutions; provided that

   (a) no unit of study for which credit is granted has been a basis for the award of any other degree or diploma;

   (b) 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;

   (c) the unit or units were completed within six years immediately preceding the commencement of candidature for the APEC Master of Sustainable Development.

Result of candidature

9. (1)The Board of Postgraduate Studies will award the degree when the coursework results are satisfactory and the Program Director recommends the award of the degree.

   (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 Program Director has so recommended.

Satisfactory progress

10. The Board of Postgraduate Studies may require a candidate proceeding by coursework to show good cause why he or she should be allowed to re-enrol in a unit of study which has been twice failed or discontinued to count as failure.

Delegation

11. In these resolutions:

   (1) Faculty delegates its responsibility to the Board of Postgraduate Studies.

   (2) The Board of Postgraduate Studies delegates the following responsibilities to the Dean who in turn delegates them to the Associate Dean (Postgraduate Studies), approval of:

   (a) award of the APEC Master of Sustainable Development

   (b) admission to candidature

   (c) supervisory arrangements

   (d) variation of candidature

   (e) completion of candidature away from the University

   (f) extensions of candidature

   (g) suspension of candidature.

Completion of course

Except by permission of the Dean, no students shall be allowed to sit for any examination unless the requirements specified by the Faculty have been completed. 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. Students who fail to show sufficient cause are excluded from admission to examinations. No excuse for absence from lectures, demonstration or practical work shall be received unless tendered in writing to the Faculty Office within one week after attendance is resumed.

■ Enrolment regulations

Discontinuation of enrolment and readmission after discontinuation -postgraduate

All Faculties, Colleges, Boards of Studies and Graduate Schools - all candidates

1. A candidate will be presumed to have discontinued enrolment in a unit of study, degree or diploma from the date of application to the Faculty, College, Board of Studies or Graduate School concerned, unless evidence is produced (i) that the discontinuation occurred at an earlier date, and (ii) that there was good reason why the application could not be made at the earlier time.
2. A candidate who at any time discontinues enrolment from a degree or diploma shall not be entitled to re-enrol in that degree or diploma unless the candidate is readmitted to candidature for that degree or diploma.
3. Subject to subsections (i) and (ii) of section 1, candidates may not discontinue enrolment in a unit of study after the end of classes in that unit, unless the degree or diploma regulations permit otherwise.
4. The Dean, Pro-Dean or an Associate Dean of a Faculty, Director or Deputy Director of a College, a Chairperson of a Board of Studies or a Chairperson of a Graduate School may act on behalf of that Faculty, College, Board of Studies or Graduate School in the administration of these resolutions.

Candidates proceeding mainly by coursework

Withdrawal from full-year and March Semester units of study

5. A candidate for a degree or diploma who discontinues enrolment in a full-year or March Semester unit of study on or before 30 March in that year, shall be recorded as withdrawn from that unit.

Withdrawal from July Semester units of study

6. A candidate for a degree or diploma who discontinues enrolment in a July Semester unit of study on or before 30 August in that year, shall be recorded as withdrawn from that unit.

Discontinuation

7. A candidate for a degree or diploma who discontinues enrolment in a unit of study after the withdrawal period but before the end of classes in that unit, shall be recorded as 'Discontinued - Not to count as failure' in that unit, unless the degree or diploma resolutions permit otherwise.

Candidates proceeding mainly by thesis

Withdrawal

8. A candidate who discontinues enrolment in a unit of study or degree before the end of the fifth week of enrolment, shall be recorded as having withdrawn from that unit or degree.

Discontinuation

9. A candidate who discontinues enrolment in a unit of study or degree after the end of the fifth week of enrolment shall be recorded as 'Discontinued - Not to count as failure'.

Board of Postgraduate Studies

Pursuant to the resolutions of Senate the Faculty appoints the following Board of Postgraduate Studies:

Dean
Associate Dean (Postgraduate Studies)
Professors
Heads of Department/School (or nominees)
A representative appointed by the Dean of the Faculty of Veterinary Science
Two elect representatives of the Faculty of Agriculture, Food and Natural Resources.

■ Resolutions of the Faculty relating to the Bachelor degrees in the Faculty of Agriculture, Food and Natural Resources

These Resolutions must be read in conjunction with the University of Sydney (Undergraduate Courses) Rule 1999, which set out the requirements for all undergraduate degree courses, and with the relevant Faculty Resolutions.

Section 1

1. To qualify for a degree, candidates must complete units of study making a total of 192 credit points and Professional Experience specified for individual degree courses. In a full-time program the normal load will be 48 credit points in each year for 4 years. The degree program must be completed within 10 calendar years of the first enrolment or readmission without credit. If a candidate is admitted or readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.
2. The following units of study shall be completed for degrees offered by the Faculty.

Restrictions on units

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.

(a) A candidate for the degree of **Bachelor of Agricultural Economics** shall complete the following units of study:

Unit code	Unit name
Yearl	
AGEC 1001	Agricultural Economics 1A
AGEC 1002	Agricultural Economics 1B
ECMT 1XXX	Econometrics (level 1000)
ECMT 1XXX	Econometrics (level 1000)
ECON 1002	Introductory Macroeconomics
ECON 1001	Introductory Microeconomics
and 12 credit points from Table 1 attached to these resolutions.	
Year 2	
AGEC 2005	Applied Commodity Modelling 2
AGEC 2001	Commodity Price Analysis 2
ECON 2002	Intermediate Macroeconomics
ECON 2001	Intermediate Microeconomics
AGEC 2003	Production Economics 2
and a minimum of 12 credit points from Tables 1 or 2 attached to these resolutions.	
Year 3	
AGEC 3001	Agribusiness Management 3
AGEC 3002	Agricultural and Resource Policy 3
AGEC 3004	Research Methods 3
ECON3XXX	two level 3000 Economics units (options)
(8 credit points each)	
and a minimum of 12 credit points from Table 2 attached to these resolutions.	
Year 4	
AGEC 4010	Contemporary Issues 4A
AGEC 4011	Contemporary Issues 4B
AGEC 4012	Research Project 4A1
AGEC 4013	Research Project 4A2
and a minimum of 24 credit points from	
AGEC 4009	Agricultural Finance and Risk Management 4
AGEC 4003	Applied International Trade 4
AGEC 4004	Applied Marketing 4
AGEC 4005	Natural Resource Economics 4
AGEC 4008	Quantitative Planning Methods 4
AGEC 4007	Special Topics in Agricultural & Resource Economics 4

Table 1: Units which may be taken in Year 1 and/or Year 2 of the BAgrEc degree

Unit code	Unit name	Credit points
No more than 24 credit points from this table may count towards the degree.		
ACCT 1001	Accounting IA	6
ACCT 1002	Accounting IB	6
CROP 1001	Agricultural SciencelA	6
CROP 1002	Agricultural Science 1B	6
BIOL 1001	Concepts in Biology	6
BIOL 1002	Living systems	6
BIOL 1003	Human Biology	6
CLAW 1001	Commercial Transactions A	6
CLAW 1002	Commercial Transactions B	6
ACCT 1003	Financial Accounting Concepts*	6
GEOG1XXX	Geography (level 1000 units)	6/6

Table 1: Units which may be taken in Year 1 and/or Year 2 of the BAgrEc degree

Unit code	Unit name	Credit points
GOVT1XXX	Government (level 1000 units)	6/6
HORT 1001	Horticultural Science 1A	6
HORT 1002	Horticultural Science 1B	6
MATH 1011	Life Sciences Calculus	3
MATH 1012	Life Sciences Algebra	3
MATH 1013	Life Sciences Difference and Differential Equations	3
MATH 1015	Life Sciences Statistics	3
ACCT 1004	Management Accounting Concepts*	6
Modem Language (level 1000 units)		6

* Cannot be counted with Accounting IA & IB

Table 2: Units which may be taken in Year 2 and/or Year 3 of the BAgrEc degree

Unit code	Unit name	Credit points
ACCT 2XXX	Accounting (any level 2000 unit)	8
ACCT 3XXX	Accounting (any level 3000 unit)	8
AGRO 3001	Agronomy 3	8
ANSC 2O03	Animal Science 2AE	4
ASNS 2601	Asian Studies IA	4
ASNS 2602	Asian Studies IB	4
ASNS 2603	Asian Studies 2A	4
ASNS 2604	Asian Studies 2B	4
ASNS 3601	Asian Studies 3A	4
ASNS 3602	Asian Studies 3B	4
CLAW 2XXX	Commercial Law (any level 2000 unit)	8
CLAW 3XXX	Commercial Law (any level 3000 unit)	8
CROP 2002	Crop and Pasture Agronomy 2	6
ECMT 2010	Regression Modelling	8
ECMT 2021	Analysis of Discrete Choice Data	8
ECMT 3XXX	Econometricst (any level 3000 unit)	8
ECHS 2XXX	Economic History (any level 2000 unit)	8
ECON 3XXX	Economics (any level 3000 unit)	8
FTNC 2XXX	Finance (any level 2000 unit)	8
FINC3XXX	Finance (any level 3000 unit)	8
HORT 3002	Flower and Nursery Crops 3	4
GEOG 2XXX	Geography (any level 2000 unit)	8
GEOG3XXX	Geography (any level 3000 unit)	12
GOVT 2XXX	Government (any level 2000 unit)	8
HORT 3001	Horticultural Science 3	8
MKTG 2XXX	Marketing (any level 2000 unit)	8
MKTG 3XXX	Marketing (any level 3000 unit)	8
Modern Language (level 2000/3000 units)		4/8
AGEC 4007	Special Topics in Agricultural and Resource Economics 4	8

Units of study from the BScAgr, BHortSc or BLWSc degrees, subject to the approval of the Head of Department of Agricultural and Resource Economics and the Head of the School of Land, Water and Crop Sciences.

(b) A candidate for the degree of **Bachelor of Animal Science** shall complete the following units of study:

Unit code	Unit name
Yearl	
ENTO 1001	Agricultural Entomology 1
CROP 1001	Agricultural Science 1A
CROP 1002	Agricultural Science 1B
BIOL 1201	Biology-Agricultural Concepts
BIOL 1202	Biology - Agricultural Systems
BIOM 1001	Biometry 1
AGEC 1001	Economic Environment of Australian Agriculture IA
AGEC 1002	Economic Environment of Australian Agriculture IB
CHEM 1001	Fundamentals of Chemistry 1 A; AND
CHEM 1002	Fundamentals of Chemistry 1B
Or	
CHEM 1901	Chemistry 1A Advanced; AND
CHEM 1902	Chemistry 1B Advanced

Unit code	Unit narne
Year 2	
AGCH2002	Agricultural Chemistry 2
GENE 2001	Agricultural Genetics 2
MICR 2101	Agricultural Microbiology 2
ANSC 2001	Animal Science 2
BIOM2001	Biometry 2
CROP 2002	Crop Protection 2
CROP 2001	Crop Science 2
SOE. 2003	Soil Science 2
Year 3	
ANSC 3001	Animal Nutrition 3
ANSC 3002	Animal Reproduction 3
ANSC 3003	Animal Structure and Function 3A
And other units of study chosen from the following list, such units to have a minimum total value of 24 credit points (see Table 6 in (g) for credit point values):	
AGEC 3001	Agribusiness Management 3
AGCH 3016	Agricultural Biotechnology 3
MICR 3102	Agricultural Microbiology 3
AGRO 3001	Agronomy 3
ANSC 3005	Animal Biotechnology 3
ANSC 3004	Animal Structure and Function 3B
AGEC 4004	Applied Marketing 4
AGCH 3020	Chemistry and Biochemistry of Ecosystems A
AGCH 3021	Chemistry and Biochemistry of Ecosystems B
AGEC 2001	Commodity Price Analysis 2
BIOM 3002	Experimental Design 3
AGCH 3017	Food Chemistry and Biochemistry A
AGCH 3018	Food Chemistry and Biochemistry B
PPAT 3002	Plant Disease 3
AGEC 2003	Production Economics 2
AGCH 3012	Rural Environmental Chemistry 3
RSIS 3001	Rural Spatial Information Systems 3
SOIL 3003	Soil Science 3
BIOM 3003	Statistical Modelling 3
Year 4	
ANSC 4001	Animal Production 4A
ANSC 4002	Animal Production 4B

(c) A candidate for the degree of **Bachelor of Horticultural Science** shall complete the following units of study:

Unit code	Unit name
Yearl	
ENTO 1001	Agricultural Entomology 1
BIOL 1201	Biology - Agricultural Concepts
BIOL 1202	Biology -Agricultural Systems
BIOM 1001	Biometry 1
AGEC 1001	Economic Environment of Australian Agriculture 1A
AGEC 1002	Economic Environment of Australian Agriculture IB
HORT 1001	Horticultural Science 1A
HORT 1002	Horticultural Science 1B
CHEM 1001	Fundamentals of Chemistry 1A; AND
CHEM 1002	Fundamentals of Chemistry 1B
Or	
CHEM 1901	ChemistrylA Advanced; AND
CHEM 1902	Chemistry 1B Advanced
Yearl	
AGCH 2002	Agricultural Chemistry 2
GENE 2001	Agricultural Genetics 2
MICR 2101	Agricultural Microbiology 2
BIOM 2001	Biometry 2
CROP 2002	Crop Protection 2
CROP 2001	Crop Science 2
HORT 2001	Horticultural Science 2
SOIL 2003	Soil Science 2
Year3	
Units of study chosen from the following list, such units to have a minimum total value of 48 credit points (See Table 6 in (g) for credit point values):	
AGEC 3001	Agribusiness Management 3
AGCH 3016	Agricultural Biotechnology 3
CROP 3003	Agricultural Systems for Horticultural Science 3
AGRO 3001	Agronomy 3
AGEC 2001	Commodity Price Analysis 2
AGEC 4004	Applied Marketing 4
AGCH 3020	Chemistry and Biochemistry of Ecosystems A
AGCH 3021	Chemistry and Biochemistry of Ecosystems B
BIOM 3002	Experimental Design 3
HORT 3002	Flower and Nursery Crops 3
AGCH 3017	Food Chemistry and Biochemistry A
AGCH 3018	Food Chemistry and Biochemistry B
HORT 3001	Horticultural Science 3
PPAT 3002	Plant Disease 3
HORT 3003	Postharvest Biology and Technology 3
AGEC 2003	Production Economics 2
AGCH 3012	Rural Environmental Chemistry 3
SOIL 3003	Soil Science 3
BIOM 3003	Statistical Modelling 3
Year 4	
HORT 4001	Horticultural Science 4A
HORT 4002	Horticultural Science 4B

(d) A candidate for the degree of **Bachelor of Land and Water Science** shall complete the following units of study:

Unit code	Unit name
Yearl	
BIOL 1001	Concepts in Biology
BIOM 1002	Environmetrics 1
ENVI1001	Global Geology
ENVI1002	Geomorphic Environments and Change
LWSC 1001	Land and Water Science 1A
LWSC 1002	Land and Water Science 1B
CHEM 1001	Fundamentals of Chemistry 1A; AND
CHEM 1002	Fundamentals of Chemistry 1B
Or	
CHEM 1101	Chemistry 1 A; AND
CHEM 1102	Chemistry 1 B
Or	
CHEM 1901	Chemistry 1A Advanced; AND
CHEM 1902	Chemistry 1B Advanced
Year 2	
AGCH 2002	Agricultural Chemistry 2
BIOM 2002	Environmetrics 2
GEOG 2303	Fluvial and Groundwater Geomorphology
LWSC 2001	Land and Water Science 2
MICR 2013	Introductory Microbiology (Land and Water Science)
BIOL 2004	Plant Ecology and Diversity
SOIL 2003	Soil Science 2
Year 3	
AGCH 3020	Chemistry and Biochemistry of Ecosystems A
AGEC3032	Introductory Land and Water Economics 3
ENVI 3004	Environmental Impact Assessment
LWSC 3001	Hydrology and Catchment Management
RSIS 3001	Rural Spatial Information Systems 3
SOIL 3003	Soil Science 3
AGRO 3001	Agronomy 3
together with 16 credit points of electives chosen from units offered by the Faculties of Agriculture. Food and Natural Resources, Economics and Business, Engineering, Rural Management, and Science in relevant disciplines - ecology, land science, water science, biophysical modelling, socioeconomics and political systems, and approved by the course coordinator.	
Year 4	
ENVI 3003	Law and the Environment
LWSC 4001	Planning and Communication Policy
LWSC 4002	Research Project 4

together with 12 credit points of electives chosen from units offered by the Faculties of Agriculture, Economics, Engineering, Rural Management, and Science in relevant disciplines - ecology, land science, water science, biophysical modelling, socioeconomics and political systems, and approved by the course coordinator.

(e) A candidate for *the* degree of **Bachelor of Resource Economics** shall complete the following units of study:

Unit code	Unit name
Yearl	
AGEC 1031	Resource Economics 1
BIOL 1001 and 1002	Concepts in Biology, and Living Systems; or
BIOL 1901 and 1902	Concepts in Biology (Advanced), and Living Systems (Advanced); or
LWSC 1001 and 1002	Land & Water Science 1A and IB
CHEM 1001 and 1002	Fundamentals of Chemistry 1A and IB; or
CHEM 1101 and 1102	Chemistry 1A & B; or
CHEM 1901 and 1902	Chemistry 1A and IB (Advanced)
MATH 1001	Differential Calculus *and*
MATH 1002	Linear Algebra *and*
MATH 1003	Integral Calculus and Modelling *and*
MATH 1005	Statistics; or
(Advanced levels) MATH 1901/1902/1903/1905	
ECON 1001	Introductory Microeconomics
Year 2	
AGEC 2005	Applied Commodity Modelling 2
AGEC 2001	Commodity Price Analysis 2
ECON 2001	Intermediate Microeconomics
ECON 1002	Introductory Macroeconomics
GEOG 2001	Processes in Geomorphology
AGEC 2003	Production Economics 2
GEOG 2302	Fluvial Geomorphology; or
GEOG 2002	Fluvial and Coastal Geography
Year 3	
AGEC 3002	Agricultural and Resource Policy 3
ECON 3XXX	Economics (any level 3000 unit)
ECON 2002	Intermediate Macroeconomics
AGEC 3031	Resource Economics 3
together with 16 credit points of electives chosen from Table 3 below.	
Year 4	
ECON3XXX	level 3000 unit (option)
ENVI3003	Law and the Environment
AGEC 4041	Research Methods 4
AGEC 4031	Resource Economics Project 4

together with at least 12 credit points of units chosen from Table 5 below, and an additional unit(s) if necessary, chosen from Table 4, for a total of 48 credit points.

Table 3: Units from which Year Three BResEc students take electives

Units in the following discipline areas (Level 2000 unless otherwise specified):

- agricultural economics (Level 3000)
- agricultural chemistry
- animal science
- biology
- chemistry
- crop sciences
- economics (Level 2000 or 3000)
- environmental science
- geography (Level 2000 or 3000)
- geology
- land and water science
- mathematics
- marine science
- resource economics (Level 3000)
- soil science.

Table 4: Units from which Year Four BResEc students take electives

Units in the JFollowing discipline areas (Level 2000 or 3000 unless otherwise specified):

- agricultural economics (Level 3000 or 4000)
- ′ agricultural chemistry
- animal science
- biology
- chemistry
- crop sciences
- economics
- environmental science
- geography
- geology
- land and water science
- mathematics
- marine science
- resource economics (Level 3000 or 4000)
- soil science

Table 5: Resource Economics units from which Year Four BResEc students take electives

Unit code	Unit name
AGEC 4032	Methods of Non-market Valuation 4
AGEC 4033	Minerals and Energy Economics 4
AGEC 4034	Renewable Resource Economics 4
AGEC 4035	Environmental Economics 4
AGEC 4036	Water Economics 4

(f) A candidate for the degree of **Bachelor of Science in Agriculture** shall complete the following units of study:

Unit code	Unit name
Yearl	
ENTO 1001	Agricultural Entomology 1
CROP 1001	Agricultural Science 1A
CROP 1002	Agricultural S c i e n c e 1B
BIOL 1201	Biology -Agricultural Concepts
BIOL 1202	Biology -Agricultural Systems
BIOM 1001	Biometry 1
AGEC 1001	Economic Environment of Australian Agriculture 1A
AGEC 1002	Economic Environment of Australian Agriculture IB
CHEM 1001 and 1002	Fundamentals of Chemistry 1A and IB; or
CHEM 1901 and 1902	Chemistry 1A and IB (Advanced)
Year 2	
AGCH 2002	Agricultural Chemistry 2
GENE 2001	Agricultural Genetics 2
MICR2101	Agricultural Microbiology 2
ANSC 2001	Animal Science 2
BIOM 2001	Biometry 2
CROP 2002	Crop Protection 2
CROP 2001	Crop Science 2
SOIL 2003	Soil Science 2
Year 3	
Units of study chosen from the following list, such units to have a minimum total value of 48 credit points (See Table 6 in (g) for credit point values):	
AGEC 3001	Agribusiness Management 3
AGCH 3016	Agricultural Biotechnology 3
MICR3102	Agricultural Microbiology 3
CROP 3002	Agricultural Systems and Irrigation Science 3*
CROP 3003	Agricultural Systems for Horticultural Science 3*
AGRO 3001	Agronomy 3
ANSC 3005	Animal Biotechnology 3
ANSC 3001	Animal Nutrition 3
ANSC 3002	Animal Reproduction 3
ANSC 3003	Animal Structure and Function 3A
ANSC 3004	Animal Structure and Function 3B
AGEC 4004	Applied Marketing 4
AGCH 3020	Chemistry and Biochemistry of Ecosystems A
AGCH 3021	Chemistry and Biochemistry of Ecosystems B
AGEC 2001	Commodity Price Analysis 2
BIOM 3002	Experimental Design 3
HORT3002	Flower and Nursery Crops 3
AGCH 3017	Food Chemistry and Biochemistry A
AGCH 3018	Food Chemistry and Biochemistry B
HORT 3001	Horticultural Science 3
PPAT 3002	Plant Disease 3
HORT 3003	Postharvest Biology and Technology 3
AGEC 2003	Production Economics 2
AGCH 3012	Rural Environmental Chemistry 3
RSIS 3001	Rural Spatial Information Systems 3
SOIL 3003	Soil Science 3
BIOM 3003	Statistical Modelling 3
* mutually exclusive	

Unit code	Unit name
Year 4	
One of the following subject areas:	
AGEC 4022 and 4023	Agribusiness 4 (Agribusiness 4A and 4B)
AGCH 4002 and 4003	Agricultural Chemistry 4 (Agricultural Chemistry 4A and 4B)
AGEC 4020 and 4021	Agricultural Economics 4 (Agricultural Economics 4A and4B)
ENTO 4001 and 4002	Agricultural Entomology 4 (Agricultural Entomology 4A and 4B)
GENE 4001 and 4002	Agricultural Genetics 4 (Agricultural Genetics 4A and 4B)
MICR 4101 and 4102	Agricultural Microbiology 4 (Agricultural Microbiology 4Aand4B)
AGRO 4001 and 4002	Agronomy 4 (Agronomy 4A and 4B)
ANSC 4001 and 4002	Animal Production 4 (Animal Production 4A and 4B)
BIOM 4001 and 4002	Biometry 4 (Biometry 4A and 4B)
AGCH 4004 and 4005	Cereal Science 4 (Cereal Science 4A and 4B)
FARM 4001 and 4002	Farming Systems 4 (Fanning Systems 4A and 4B)
HORT 4001 and 4002	Horticultural Science 4 (Horticultural Science 4A and 4B)
PPAT 4001 and 4002	Plant Pathology 4 (Plant Pathology 4A and 4B)
AGEC 4024 and 4025	Resource Economics 4 (Resource Economics 4A and 4B)
SOIL 4002 and 4003	Soil Science 4 (Soil Science 4A and 4B)
AGFR 4001 and 4002	Special Program 4 (Special Program 4A and 4B)

(g) Table 6: Credit points of the units of study listed in Resolution 2

The prerequisite/corequisite/assumed knowledge and special conditions are set out in the summary Table of Units of Study published in the Faculty Handbook. A student who enrols in accordance with these resolutions, in a unit or units of study prescribed for a degree other than that in which the student is enrolled, shall satisfy the prerequisite, corequisites and other requirements prescribed for such units of study.

Unit code	Unit name	Credit points
AGEC 4022	Agribusiness 4A	24
AGEC 4023	Agribusiness 4B	24
AGEC 3001	Agribusiness Management 3	8
AGEC 3002	Agricultural and Resource Policy 3	8
AGCH3016	Agricultural Biotechnology 3	4
AGCH 2002	Agricultural Chemistry 2	8
AGCH4002	Agricultural Chemistry 4A	24
AGCH 4003	Agricultural Chemistry 4B	24
AGEC 1001	Agricultural Economics 1A	6
AGEC 1002	Agricultural Economics 1B	6
AGEC 4020	Agricultural Economics 4A	24
AGEC 4021	Agricultural Economics 4B	24
ENTO 1001	Agricultural Entomology 1	4
ENTO4001	Agricultural Entomology 4A	24
ENTO 4002	Agricultural Entomology 4B	24
AGEC 4009	Agricultural Finance and Risk Management 4	4
GENE 2001	Agricultural Genetics 2	6
GENE 4001	Agricultural Genetics 4A	24
GENE 4002	Agricultural Genetics 4B	24
MICR 2101	Agricultural Microbiology 2	6
MICR 3102	Agricultural Microbiology 3	8
MICR 4101	Agricultural Microbiology 4A	24
MICR 4102	Agricultural Microbiology 4B	24
CROP 1001	Agricultural Science 1A	6
CROP 1002	Agricultural Science 1B	6
CROP 3002	Agricultural Systems and Irrigation Science 3	8
CROP 3003	Agricultural Systems for Horticult'l Science 3	4
AGRO 3001	Agronomy 3	8
AGRO4001	Agronomy 4A	24
AGRO 4002	Agronomy 4B	24
ECMT 2021	Analysis of Discrete Choice Data	8
ANSC 3005	Animal Biotechnology 3	4
ANSC 3001	Animal Nutrition 3	8
ANSC 4001	Animal Production 4A	24
ANSC 4002	Animal Production 4B	24
ANSC 3002	Animal Reproduction 3	8
ANSC 2001	Animal Science 2	6
ANSC 2003	Animal Science 2AE	4
ANSC 3003	Animal Structure and Function 3A	8
ANSC 3004	Animal Structure and Function 3B	8
BIOL 2001	Animals A	8
AGEC 2005	Applied Commodity Modelling 2	4
AGEC 4003	Applied International Trade 4	8
AGEC 4004	Applied Marketing 4	8
BIOL 1201	Biology 1 -Agricultural Concepts	4
BIOL 1202	Biology 1 -Agricultural Systems	5
BIOM 1001	Biometry 1	5
BIOM 2001	Biometry 2	6
BIOM 4001	Biometry 4A	24
BIOM 4002	Biometry 4B	24
AGCH 4004	Cereal Science 4A	24
AGCH 4005	Cereal Science 4B	24
CHEM1101	Chemistry 1A	6
CHEM 1901	Chemistry 1A (Advanced)	6
CHEM1102	Chemistry 1B	6
CHEM 1902	Chemistry 1B (Advanced)	6
AGCH 3020	Chemistry and Biochemistry of Ecosystems A	4
AGCH 3021	Chemistry and Biochemistry of Ecosystems B	4
AGEC 2001	Commodity Price Analysis 2	8
BIOL 1001	Concepts in Biology	6
BIOL 1901	Concepts in Biology (Advanced)	6
AGEC 4010	Contemporary Issues 4A	4
AGEC 4011	Contemporary Issues 4B	4
CROP 2002	Crop Protection 2	4
CROP 2001	Crop Science 2	6
MATH 1001	Differential Calculus	3
MATH 1901	Differential Calculus (Advanced)	3
ECMT 1XXX	Econometrics (level 1000)	6
ECMT 1XXX	Econometrics (level 1000)	6
AGEC 1001	Economic Environment of Australian Agriculture 1A	3
AGEC 1002	Economic Environment of Australian Agriculture IB	3
ECON 3XXX'.	Economics level 3000 (option)	8
ENVI3003	Law and the Environment	4
ENVI3004	Environmental Impact Assessment	4
AGEC 4035	Environmental Economics 4	4
BIOM 1002	Environmetrics 1	6
BIOM 2002	Environmetrics 2	4
BIOM 3002	Experimental Design 3	4
FARM 4001	Farming Systems 4A	24
FARM 4002	Farming Systems 4B	24
ACCT 1003	Financial Accounting Concepts	6
HORT 3002	Flower and Nursery Crops 3	4
GEOG 2002	Fluvial and Coastal Geography	8
GEOG 2302	Fluvial Geomorphology	6
GEOG 2303	Fluvial and Groundwater Geomorphology	8
AGCH 3017	Food Chemistry and Biochemistry A	4
AGCH 3018	Food Chemistry and Biochemistry B	4
CHEM 1001	Fundamentals of Chemistry 1A	6
CHEM 1002	Fundamentals of Chemistry 1B	6
ENVI 1002	Geomorphic Environments and Change	6
ENVI 1001	Global Geology	6
HORT 2001	Horticultural Science 2	6
HORT 3001	Horticultural Science 3	8
HORT 4001	Horticultural Science 4A	24
HORT 4002	Horticultural Science 4B	24
BIOL 1003	Human Biology	6
LWSC 3001	Hydrology and Catchment Management	4
MATH 1003	Integral Calculus and Modelling	3
MATH 1903	Integral Calculus and Modelling (Advanced)	3
ECON 2002	Intermediate Macroeconomics	8

Unit code	Unit name	Credit points
ECON 2001	Intermediate Microeconomics	8
AGEC 3032	Introductory Land and Water Economics 3	4
ECON 1002	Introductory Macroeconomics	6
MICR2013	Introductory Microbiology 2 (LWSC)	4
ECON 1001	Introductory Microeconomics	6
LWSC3002	Irrigation Technology	4
LWSC 1001	Land and Water Science 1A	6
LWSC 1002	Land and Water S c i e n c e 1B	6
LWSC 2001	Land and Water Science 2	4
ENVI3003	Law and the Environment	4
MATH 1002	Linear Algebra	3
MATH 1902	Linear Algebra (Advanced)	3
BIOL 1002	Living Systems	6
BIOL 1902	Living Systems (Advanced)	6
ACCT 1004	Management Accounting Concepts	6
AGEC 4032	Methods of Non-market Valuation 4	4
AGEC 4033	Minerals and Energy Economics 4	4
AGEC 4005	Natural Resource Economics 4	8
LWSC 4001	Planning and Communication Policy	4
PPAT 3002	Plant Disease 3	4
BIOL 2004	Plant Ecology and Diversity	8
PPAT 4001	Plant Pathology 4A	24
PPAT 4002	Plant Pathology 4B	24
HORT 3003	Postharvest Biology and Technology 3	4
LWSC3003	Principles of Efficient Crop Water Management	4
GEOG 2001	Processes in Geomorphology	8
AGEC 2003	Production Economics 2	8
AGEC 4008	Quantitative Planning Methods 4	4
ECMT 2010	Regression Modelling	8
AGEC 4034	Renewable Resource Economics 4	4
AGEC 3004	Research Methods 3	4
AGEC 4041	Research Methods 4	4
LWSC 4002	Research Project 4	24
AGEC 4012	Research Project Al	8
AGEC 4013	Research Project A2	8
AGEC 1031	Resource Economics 1	6
AGEC 3031	Resource Economics 3	8
AGEC 4024	Resource Economics 4A	24
AGEC 4025	Resource Economics 4B	24
AGEC 4031	Resource Economics Project 4	12
AGCH3012	Rural Environmental Chemistry 3	4
RSIS 3001	Rural Spatial Information Systems 3	4
SOIL 2003	Soil Science 2	6
SOIL 3003	Soil Science 3	8
SOIL 4002	Soil Science 4A	24
SOIL 4003	Soil Science 4B	24
AGRF4001	Special Program 4A	24
AGRF4002	Special Program 4B	24
AGEC 4007	Special Topics in Agricultural and Resource Economics 4	4
MATH 1005	Statistics	3
MATH 1905	Statistics (Advanced)	3
AGEC 4036	Water Economics 4	4

3. Variations permitted to the requirements specified in Resolution 2 include:

(i) Talented students

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

(ii)Summer School

Units of study completed at the University of Sydney Summer School which correspond to units of study in the Table of Undergraduate Units of Study (Resolution 2(g) Table 6) may be credited towards the course requirements

(iii)Cross-institutional enrolment

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

(a) the unit of study content is material not taught in any corresponding unit of study in the University, or

(b) the student is unable for good reason to attend a corresponding unit of study at the University.

(iv)Additional units

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

(v) Timetable clashes

A student must obtain written permission of the Head or Heads of Departments/Schools concerned, and the permission of the Dean, all of whom may impose conditions of attendance, to enrol in units of study which have timetable clashes.

(vi)Restriction on enrolment

A student must obtain the written permission of the Dean 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.

(vii)Credit Transfer

(a) 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 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.

(b)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.

Section 2

4. Assessment policy

(i) Assessment methods for units of study offered by a Department/School 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.

(ii)Examinations

(a) Completion of unit of study

A student who has been absent from more than 10 per cent 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.

(b) Further Testing

A Head of Department/School may arrange for further testing of students in addition to scheduled assessments and examinations, in accordance with Academic Board policy.

Further tests for the BAgrEc, BAnimSc, BHortSc, BLWSc, BResEc and BScAgr, degrees

1. Further tests may be awarded by the examining Department/School 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.

2. 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. The highest grade of award available is Pass.

3. Where possible and practicable, all further tests will be administered and results finalised no later than 2 weeks after the end of the examination period.

4. The Head of Department/School is responsible for the awarding, timetabling and conduct of further tests, which may take such form as the Head of Department/School directs. 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. 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.

6. In respect to the notification of students referred to in sections 4 and 5, students will be deemed to have been notified by the Department/School as a result of the

posting of information by the due date on one or more noticeboards as advised by the Department/School concerned.

7. It is the responsibility of the student to provide written evidence of illness or misadventure to the appropriate Head of Department/School 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, it will only be considered by the Head of Department/School where there is sufficient reason why it has not been presented by that date.

(iii) Pass (Concessional)

(a) The award of a Pass (concessional)(marks 46-49) in a unit of study entitles the student to receive credit points for that unit of study and to continue in the degree course unhindered.

(b)The concessional pass is not available for candidates in the BAgrEc and BResEc degrees.

(c) For candidates in the BScAgr, BAnimSc, BHortSc and BLWSc degrees:

(1) Concessional passes are available only in level 1000 units of study (maximum of 12 credit points) and level 2000 units of study (maximum of 14 credit points)

(2) When Concessional pass results total more than 12 (level 1000) or 14 (level 2000) credit points, the student shall decide which unit of study or units of study to count for the degree.

Honours

5. (i) First Class or Second Class Honours, Division One or Division Two may be awarded at graduation.

(ii) 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.

(iii) Award of honours at graduation

1. Honours are awarded in Agriculture and not in an individual subject.

2. Details of the Fourth Year work and determination of marks for Fourth Year are the responsibility of the head of the Department/School and sections concerned.

3. All candidates who have completed an independent research project as part of the final year degree program are formally eligible to be considered for honours. Except with the special permission of the Faculty, honours shall not be awarded to any candidate for the degree of Bachelor of Science in Agriculture, Bachelor of Animal Science, Bachelor of Horticultural Science, Bachelor of Land and Water Science, Bachelor of Agricultural Economics or Bachelor of Resource Economics unless the candidate has completed the course in the minimum time.

Notwithstanding the previous condition, candidates who complete the first three years of the course in four years, and who by virtue of their weighted average marks would otherwise qualify for the award of honours, will be so considered. Such candidates may however be disadvantaged in terms of honours grading and ranking.

4. (l)For the BAgrEc and BResEc degrees. For the assessment of an aggregate mark for the award of honours at the end of the Fourth Year:

(a) Each of the units of study at level 2 and level 3 provided for in the resolutions shall be weighted according to credit point value and a weighted average mark (WAM) obtained. Each of the units of study at level 4 provided for in the resolutions shall be weighted according to credit point value and a weighted average mark (WAM) obtained.

(b)The overall aggregate honours mark shall be the average of the level 2/3 WAM and the level 4 WAM.

(2) For the BScAgr, BAnim Sc, BHortSc andBLWSc degrees. For the determination of the overall honours mark for the award of honours at the end of the Fourth Year:

(a) Each of the units of study provided for in the resolutions in Second and Third Years shall be weighted according to credit point value and a weighted average mark (WAM) obtained.

(b)The overall honours mark shall be the average of the Second and Third Year WAM and the Fourth Year mark.

5. In computing the aggregate marks of students, the mark achieved on the occasion of the first attempt at a unit of study shall be the mark used.

6. (l)For the BAgrEc and BResEc degrees. 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 WAM in Second and Third Year units of study set out in the following table:

Level of honours (under review)	Minimum overall honours mark	Minimum WAM Years 2/3
First Class	75	70
Second Class, Division 1	70	65
Second Class, Division 2	65	62

In the event of a recommendation for the award of honours that departs from these standards, it shall be incumbent upon the head of department and section concerned to make out a substantial case for such a departure. Admissible grounds for departure would include medical disability or misadventure early in the course, and the existence of consistently lower standards of grading in units of study undertaken outside the Faculty of Agriculture, Food and Natural Resources.

(2) For the BScAgr, BAnimSc, BHortSc and BLWSc degrees. For the award of a particular level of honours, a candidate, except in special circumstances, must obtain the relevant minimum marks as set out in the following table:

Level of honours (under review)	Minimum overall honours mark	Minimum WAM Year 4	Minimum WAM Years 2/3
First Class	75	75	70
Second Class, Division 1	66	70	63
Second Class, Division 2	61	65	58

In the event of a recommendation for honours that departs from these standards, it shall be incumbent upon the head of Department/School and section concerned to make a substantial case for such a departure.

7. The CAPHUM 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.

8. (1) (under review)For the BAgrEc and BResEc degree, a university medal may be awarded, on the recommendation of the Head of the Department of Agricultural and Resource Economics, to a student who has a Level 4 WAM of at least 85, an aggregate Honours mark of at least 80 and a Second/ ThirdYear WAM of at least 75.

(2) (under review) For the BScAgr, BAnimSc, BHortSc and BLWSc degrees, a university medal may be awarded, on the recommendation of the Head of the Department/School or the Animal Science Coordinator for the BAnim Sc, to a student who has a Level 4 WAM of at least 85, an overall honours mark of at least 80 and a Second/Third Year WAM of at least 75.

6. Suspension, withdrawal and discontinuation, re-enrolment, and satisfactory progress

(i) Suspension of candidature

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 departments concerned and having considered advice, may determine any conditions for re-enrolment. 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.

(ii) Withdrawal and Discontinuation of enrolment

(a) Withdrawal from March Semester units of study

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.

(b) Withdrawal from July Semester units of study

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.

(c) Discontinuation

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.

(1) 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).

(2) 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).

(3) 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' on the grounds of serious ill-health or misadventure.

(iii)Re-enrolment after an absence

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.

(iv)Satisfactory Progress - Exclusion and Re-admission

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 Faculty Exclusions and Re-admission Committee, he/she has not made satisfactory progress towards fulfilling the requirements of the degree or the unit.

Satisfactory progress cannot be defined in all cases in advance but a student who has -

(a) twice failed (F), or discontinued enrolment to count as a failure (DF), any unit of study as defined in Resolution 2 relating to the Bachelor degrees of the Faculty or

(b) failed more than sixty per cent of the credit points for which enrolled in any four successive semesters,

shall be deemed not to have made satisfactory progress.

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.

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. 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. 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.

7. *Professional **experience and Faculty** excursions*

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 Animal Science, Bachelor of Horticultural Science, Bachelor of Resource Economics and Bachelor of Science in Agriculture.

The aims of professional experience are to:

1. Familiarise students with agricultural, horticultural or natural resource industries.

2. Provide the opportunity to experience agricultural and horticultural production across a range of environments and managerial systems;

3. Provide experience with business organisations involved in finance, marketing, research and development and other aspects of the rural industries;

4. Train students to collect, collate, analyse and report.

BAgrEc, BAnimSc andBScAgr

1. Candidates must complete 18 weeks of professional experience. Each component of the experience must be approved on behalf of the Dean before credit is granted. A minimum of 6 weeks professional experience must be completed as on-farm experience, with a maximum visit of 6 weeks with any single organisation (farm or non-farm). A maximum of 4 weeks may be credited on property which is owned by the candidate's parents or by the University, however, this time is in addition to and exclusive of the minimum 6 week on-farm requirement.

2. It is a requirement that on-farm experience includes:
(a) experience in 2 different regions (and not adjacent shires)
(b) experience in 2 rural enterprises

A significant proportion of this 6 week on-farm component should be completed before non-farm professional experience is undertaken. The farms concerned must be commercial farms not hobby farms. Commercial farms are defined as those having a gross income of at least $25 000.

3. A separate report must be submitted following each visit to a farm or organisation. Credit is subject to a satisfactory and timely report. Late reports normally are not credited. Time penalties are applied to resubmitted and incomplete reports. A senior report must be completed on a commercial farm. (A maximum of 3 'General Reports' can be credited.)

4.*Students are required to attend *one* o/the North Western, Central or South Western NSW excursions arranged by the Faculty and may attend each one. A maximum of 4 weeks professional experience may be gained by attending Faculty excursions provided a satisfactory report is submitted for each excursion. The Dean may approve special activities which will be credited within the 4 week maximum. Excursion time is exclusive of your 6 week on-farm requirement.

5. Final year students wishing to graduate must complete all practical work requirements by 14 January of the year of graduation. **Reports from graduands submitted after 14 January wiD not be marked until the July semester.**

BHortSc

1. Candidates must complete 18 weeks of professional experience. Each component of the experience must be approved on behalf of the Dean before credit is granted. A minimum of 6 weeks professional experience must be completed in horticultural production industries (on-farm), with a maximum visit of 6 weeks with any single organisation (farm or non-farm). A maximum of 4 weeks may be credited on property which is owned by the candidate's parents or by the University, however, this time is in addition to and exclusive of the minimum 6 week on-farm requirement.

2. It is a requirement that the experience in horticultural production industries include a minimum of 2 weeks in at least 2 industries in at least 2 climatic regions as defined below. A significant proportion of this 6 week on-farm component should be completed before non-farm professional experience is undertaken. The farms concerned must be commercial farms not hobby farms. Commercial farms are defined as those having a gross income of at least $25 000.

The horticultural industries are classified into 4 groups for professional experience:

- Fruit and Nut
- Vegetables
- Ornamentals (including nursery stock, cut flower and turf production)
- Amenity (including parks, gardens and streetscape establishment and maintenance and landscape horticulture).

The Australian regions are listed in the back of the Professional Experience Book except that for BHortSc students the coastal region (Zone 1) is subdivided along the southern boundary of Kempsey Shire.

3. A separate report must be submitted following each visit to a farm or organisation. Credit is subject to a satisfactory and timely report. Late reports normally are not credited. Time penalties are applied to resubmitted and incomplete reports. A senior report must be completed on a commercial farm. (A maximum of 3 'General Reports' can be credited.)

4*. Students are required to attend the Faculty Horticulture Excursion, or, if this is not available during the student's Second or Third year, the Faculty North Western NSW Excursion. Horticultural Science students may also attend the North Western, Central or South Western NSW excursions arranged by the Faculty. A maximum of 4 weeks professional experience may be gained by attending excursions provided a satisfactory report is submitted for each excursion. The Dean may approve special activities which will be credited within the 4 week maximum. Excursion time is exclusive of the 6 week horticultural production industries requirement.

5. Final year students wishing to graduate must complete all practical work requirements by 14 January of the year of graduation. **Reports from graduands submitted after 14 January will not be marked until the July semester.**

BResEc

1. Candidates must complete 18 weeks of professional experience by completing several placements. Each placement with a single organisation will normally be for at least two weeks and can count for no more than six weeks. Each placement must be approved by the Dean before credit is granted.

2. Students must complete at least 2 'field-work' experience placements. These placements must be with firms or organisations involved in natural resources and each must be in a different industry (eg, farming, forestry, fishing, mining, energy, water harvesting or use, national parks). 'Field-work' here means working with the resource system in situ, not managing or working in relation to it remotely.

3. At least one field-work placement will normally be completed before the commencement of the second academic year. At least two field-work placements and a minimum of eight weeks of professional experience will normally be completed before commencement of the third academic year.

4. Students must complete a minimum of four weeks on one or more placements in professional activities gaining experience of management or economic analysis of natural resources relevant to BResEc graduates.

5. Sufficient placements to accrue 18 weeks professional experience should be completed before the commencement of the final semester of the student's course of study.

6. A separate Professional Experience Report must be submitted for each placement. The placement will count towards satisfying these requirements only if the report is satisfactory and submitted by the due date as set by Faculty. Reports must follow the formats (one for field-based experience and another for professional activities experience) specified in the BResEc Professional Experience Report Book (or equivalent documentation).

7. Students are required to participate in at least one Faculty-approved excursion of at least 5 days total length. Students will be granted credit towards the 18 weeks professional experience requirement if they submit a satisfactory excursion report. Up to 2 weeks credit may be granted for satisfactory completion of excursions.

8. A maximum of 2 weeks may be credited for a natural resources enterprise which is owned or operated by the candidate's parents or by the University. However, this time is in addition to and exclusive of the minimum three placements (8 weeks) specified in clauses (2) and (4).

9. Final year students wishing to graduate must complete all professional experience requirements and submit reports by 14 January of the year of proposed graduation. **Reports from graduands submitted after 14 January will not be marked until the July semester.**

Faculty excursions

Faculty excursions can contribute up to 4 weeks of professional experience. All students must attend at least one Faculty NSW excursion. Three one week excursions are held each year in NSW. From time to time there are interstate and overseas excursions of several weeks.

***The excursions are held each year as follows:**

(a) First Year - at Easter, from Easter Monday, - to the Macquarie Valley in the Central West

(b) South West Excursion - in the 2nd semester mid-semester break (the end of September, just before the October long weekend).

(c) North West Excursion- during Orientation Week.

(d) Horticulture excursion - a requirement for Horticulture students in 2nd or 3rd year, others may join if space allows.

(e) Interstate and overseas excursions- sometimes offered in the winter break between semesters to the Northern Territory. Excursions to Indonesia or New Zealand may be offered. The Faculty arranges all local transport, food and accommodation. Students are required to meet reasonable living costs.

9 General University information

See also the Glossary for administrative information relating to particular terms.

Accommodation Service

The Accommodation Service assists students to find off-campus accommodation by maintaining an extensive database of suitable accommodation in various areas but primarily close to University or within easy access via public transport.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3312
Fax: (02) 9351 8262
TTY: (02) 9351 3412
Email: accomm@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/accom

Admissions Office

The Admissions Office is responsible for overseeing the distribution of offers of undergraduate admission and can advise prospective local undergraduate students regarding admission requirements. Postgraduate students should contact the appropriate faculty. If you are an Australian citizen or a permanent resident but have qualifications from a non-Australian institution, phone (02) 9351 4118 for more information. For enquiries regarding Special Admissions (including Mature-Age Entry), phone (02) 9351 3615. Applicants without Australian citizenship or permanent residency should contact the International Office.

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4117 or (02) 9351 4118
Fax: (02) 9351 4869
Email: admissions ©records.usyd.edu.au

Applying for a course

Prospective (intending) students must lodge an application form with the Universities Admissions Centre (UAC) by the last working day of September of the year before enrolment. Note that some faculties, such as Pharmacy, the Sydney Conservatorium of Music and Sydney College of the Arts, have additional application procedures.

Assessment

For matters regarding assessment, refer to the relevant department or school.

Careers information

Provides careers information and advice, and help in finding course-related employment both while you're studying and when you commence your career.

Careers Centre
Ground Floor, Mackie Building, K01
The University of Sydney
NSW 2006 Australia
Phone: (02)9351 3481
Fax: (02) 9351 5134
Email: info@careers.usyd.edu.au
Web: www.careers.usyd.edu.au

Casual Employment Service

The Casual Employment Service helps students find casual and part-time work during their studies and in University vacations.

Level 7, Education Building, A3 5
The University of Sydney
NSW 2006 Australia
Phone: (02)9351 8714
Fax: (02) 9351 8717
Email: ces@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/cas_emp

Centre for Continuing Education

Bridging courses, study skills courses, essay writing courses, accounting extension courses, university preparation courses, access to university courses, non-award short courses.

Mackie Building, KOI
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2907
Fax: (02) 9351 5022
Email: info@cce.usyd.edu.au
Web: www.usyd.edu.au/cce

Centre for English Teaching

The Centre for English Teaching (CET) offers a range of English language courses including Academic English, General & Business English and IELTS preparation. CET programs help international students to reach the required English language levels for entry to degrees at the University. Students have the opportunity to take the CET university direct entry test at the completion of their language programs.

Level 2, Building F, 88 Mallett St
University of Sydney (M02)
NSW 2006 Australia
Phone: (02) 9351 0706
Fax: (02) 9351 0710
Email: info@cet.usyd.edu.au
Web: www.usyd.edu.au/cet

Child care

Contact the Child Care Coordinator for information about Children's Services for students and staff of the University who are parents.

Child Care Coordinator
Level 7, Education Building, A35
Phone: (02) 9351 5667
Fax: (02) 9351 7055
TTY: (02) 9351 3412
Email: childc@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/childcare

Co-op Bookshop

Sells textbooks, reference books, general books and software. Special order services available.The Co-op Bookshop is located at:

Sydney University Sports and Aquatic Centre, G09
Cnr Codrington St and Darlington Rd
Phone: (02) 9351 3705 or (02) 9351 2807
Fax: (02) 9660 5256
Email :sydu@mail.coop-bookshop.com.au
Web: www.coop-bookshop.com.au

Counselling Service

The Counselling Service aims to help students fulfil their academic, individual and social goals through professional counselling which is free and confidential. Counselling presents an opportunity to: gain greater self awareness; learn to cope more efficiently with the problem at hand; discuss any work related, social or personal issues that cause concern; explore options with professionally trained staff. In addition, workshops are offered each semester on topics such as stress management, relaxation, exam anxiety, communication skills and others.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2228
Fax: (02) 9351 7055

Email: counsell@mail.usyd.edu.au
Web: www.usyd.edu.au/su/counsel

Disability Services

Disability Services is the principal point of contact and advice on assistance available for students with disabilities. The Service works closely with academic and administrative staff to ensure that students receive reasonable accommodations in all areas of their study. Assistance available includes the provision of notetaking, interpreters, and advocacy with academic staff to negotiate assessment and course requirement modifications where appropriate.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4554
Fax: (02) 9351 7055
Email: disserv@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/disability

Enrolment and pre-enrolment

Students entering first year

Details of the enrolment procedures will be sent with the UAC Offer of Enrolment. Enrolment takes place at a specific time and date, depending on your surname and the Faculty in which you are enrolling, but is usually within the last week of January. You must attend the University in person or else nominate, in writing, somebody to act on your behalf. On the enrolment day, you pay the compulsory fees for joining the Student Union, the Students' Representative Council and sporting bodies and nominate your preferred 'up front' or deferred payment for your Higher Contribution Scheme (HECS) liability. You also choose your first-year units of study, so it's important to consult the Handbook before enrolling.

All other students

A pre-enrolment package is sent to all enrolled students in late September, and contains instructions on the procedure for pre-enrolment.

Examinations

The Examinations and Exclusions Office looks after the majority of exam papers, timetables and exclusions. Some faculties, such as the Sydney Conservatorium of Music, make all examination arrangements for the units of study that they offer.

Examinations and Exclusions Office
Student Centre
Level 1, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4005 or (02) 9351 4006
Fax: (02) 9351 7330
Email: exams.office@exams.usyd.edu.au

Fees

For information on how to pay, where to pay, and if payments have been received.

Fees Office
Margaret Telfer Building, K07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 5222
Fax: (02) 9351 4202

Financial Assistance Office

The University has a number of loan funds and bursaries to assist students who experience financial difficulties. Assistance is not intended to provide the principal means of support but to help in emergencies and to supplement other income.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2416
Fax: (02) 9351 7055
TTY: (02) 9351 3412
Email: fao@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/fin_assist

Freedom of Information

The University of Sydney falls withm 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, to enable a member of the public to obtain access to documents held by the University and to enable a member of the public to ensure that records held by the University concerning his or her personal affairs are not incomplete, incorrect or out of date. By definition, a 'member of the public' includes staff or students of the University.

Application may be made for access to access University documents, however the Act provides some exemptions to particular documents. The Act contains review and appeal mechanisms which are required to be explained to applicants where applicable. The University is required to report to the public on its FOI activities on a regular basis. The two reports provided are the Statement of Affairs and the Summary of Affairs. The Statement of Affairs contains information about the University, its structure and function and the kinds of documents held. The Summary of Affairs identifies each of the University's policy documents and provides a contact list for those wishing to access these documents. Further information, and copies of the current reports may be found at www.usyd.edu.au/arms/foi/.

It is a requirement of the Act that applications be processed and a determination be made generaUywithin 21 days. Determinations are made by the University's Registrar.

Graduations Office

The Graduations Office is responsible for organising graduation ceremonies and informing students of their graduation arrangements.

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3199, (02) 9351 4009, Protocol (02) 9351 4612
Fax: (02) 9351 5072

(Grievances) appeals

Many decisions about academic and non-academic matters are made each year and you may consider that a particular decision affecting your candidature for a degree or other activities at the University may not have taken into account all the relevant matters.

In some cases the by-laws or resolutions of the Senate (see University Calendar) specifically 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, at the SRC, and on the University's web site at www.usyd.edu.au/su/planning/policy/.

If you wish to seek assistance or advice regarding an appeal, contact:

Students' Representative Council
Level 1, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9660 5222

HECS

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 5659, (02) 9351 5062, (02) 9351 2086
Fax: (02) 9351 5081

International Student Centre

The International Student Centre consists of the International Office (IO), the International Student Services Unit (ISSU) and the Study Abroad and Exchange Office. The International Office provides assistance with application, admission and enrolment procedures and administers scholarships for international students. The ISSU provides a wide range of international student support services including arranging arrival accommodation and offering advice and professional counselling. The Study Abroad and Exchange Unit assists both

domestic and international students who wish to enrol for Study Abroad or Exchange programs.

International Student Centre
Services Building, G12
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4079
Fax: (02) 9351 4013
Email: info@io.usyd.edu.au
Web: www.usyd.edu.au/io
International Student Services Unit
Phone: (02) 9351 4749
Fax: (02) 9351 6818
Email: info@issu.usyd.edu.au
Web: www.usyd.edu.au/issu
Study Abroad and Exchange Unit
Study Abroad
Phone: (02) 9351 5841
Fax: (02) 9351 2795
Email: studyabroad@io.usyd.edu.au
Web: www.usyd.edu.au/io/studyabroad
Exchange
Phone: (02) 9351 5843
Fax: (02) 9351 2795
Email: exchange@io.usyd.edu.au
Web: www.usyd.edu.au/io/exchange

Intranet

USYDnet is The University of Sydney's intranet. It provides easy access to staff and student directories, maps, software and useful resources for both staff and students. As well as delivering information, the intranet provides interactive services such as the calendar of events, where staff and students can enter events and publish them University-wide.

MyUni is the personalised section of USYDnet. All staff and students are provided with access to MyUni through a login name and password. This enables them to customise the information they see and also receive delivery of personal information such as exam results and seat numbers. MyUni is a portal from which students and staff can complete tasks that were previously only possible offline. Web enrolment variation is one of the first of many facilities that are helping to move the every day tasks of all members of the university online.

Koori Centre and Yooroang Garang

The Koori Centre provides tutorial assistance: access to computers, Indigenous counsellor, Aboriginal Studies library study rooms, Orientation program at the beginning of the year, and assistance in study and learning skills. Education Unit: courses in Education for ATSI students. Indigenous Studies Unit: aims to increase the awareness of Indigenous Australian issues through courses across the University.

Ground Floor, Old Teachers' College, A22
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2046 general enquiries,
(02) 9351 7003 Liaison Officer
Fax: (02) 9351 6923
Email: koori@koori.usyd.edu.au
Web: www.koori.usyd.edu.au

Language Centre

Provides self-access course materials in over 140 languages. Beginners and intermediate courses in Modern Spanish, Modern Russian, Modern Welsh, Modern Irish, Modern Portuguese languages and cultures; Diploma Course in Modern Language Teaching.

Level 2, Christopher Brennan Building, A18
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2371
Fax: (02) 9351 3626
Email: language.enquiries@language.usyd.edu.au
Web: www.arts.usyd.edu.au/Arts/departsAangcent/home.html

Learning Centre

The Learning Centre assists students to develop the generic skills which are necessary for learning and communicating knowledge and ideas at university. The Centre is committed to helping students to achieve their academic potential throughout their undergraduate and postgraduate studies. 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 the Centre provides are an Individual Learning Program (ILP), a special program for international students, Faculty-based workshops, publications of learning resources and library facilities.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3853
Fax: (02) 9351 4865
Email: lc@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/lc

Library

Students are welcome to use any of the 22 libraries in the University. The student card is also the library borrower's card. Further details of the libraries, including services provided, locations and opening hours are available on the Library's homepage www.library.usyd.edu.au as well as in the printed *Library Guide,* available at any library. Consult the Library staff for assistance.

The libraries listed below are located on the Camperdown/ Darlington campus unless otherwise specified.

Architecture Library
Wilkinson Building, G04
Phone: (02) 9351 2775
Fax: (02) 9351 4782
Email: architecture@library.usyd.edu.au
Badham Library
Badham Building, A16
Phone: (02) 9351 2728
Fax: (02) 9351 3852
Email: badham@library.usyd.edu.au
Biochemistry Library
Biochemistry Building, G08
Phone: (02) 9351 2231
Fax: (02) 9351 7699
Email: biochemistry@library.usyd.edu.au
Burkitt-Ford Library
Sir Edward Ford Building, A27
Phone: (02) 9351 4364
Fax: (02) 9351 7125
Email: burkittford@library.usyd.edu.au
Camden Library
University Farms, Camden, C15
Phone: (02) 9351 1627
Fax: (02) 4655 6719
Email: camden@library.usyd.edu.au
Chemistry Library
Chemistry Building, Fl 1
Phone: (02) 9351 3009
Fax: (02) 9351 3329
Email: chemistry@library.usyd.edu.au
Curriculum Resources Library
Old Teachers College, A22
Phone: (02) 9351 6254
Fax: (02) 9351 7766
Email: curriculum@library.usyd.edu.au
Dentistry Library
United Dental Hospital, 2 Chalmers St, Surry Hills, CI 2
Phone: (02) 9351 8331
Fax: 9212 5149
Email: dentistry@library.usyd.edu.au
Engineering Library
PN Russell Building, J02
Phone: (02) 9351 2138
Fax: (02) 9351 7466
Email: engineering@library.usyd.edu.au
Fisher Library
Eastern Ave, F03
Phone: (02) 9351 2993
Fax: (02) 9351 2890
Email: fishinf@library.usyd.edu.au

Geosciences Library
Madsen Building, F09
Phone: (02) 9351 6456
Fax: (02) 9351 6459
Email: geosciences@library.usyd.edu.au
Health Sciences Library
East St, Lidcombe, C42
Phone: (02) 9351 9423
Fax: (02) 9351 9421
Email: h.knight@cchs.usyd.edu.au
Law Library
Law School, 173-175 Phillip St, Sydney, C13
Phone: (02) 9351 0216
Fax: (02) 9351 0301
Email: library@law.usyd.edu.au
Mathematics Library
Carslaw Building, F07
Phone: (02) 9351 2974
Fax: (02) 9351 5766
Email: mathematics@library.usyd.edu.au
Medical Library
Bosch Building, D05
Phone: (02) 9351 2413
Fax: (02) 9351 2427
Email: medical@library.usyd.edu.au
Music Library
Seymour Centre, J09
Phone: (02) 9351 3534
Fax: (02) 9351 7343
Email: music@library.usyd.edu.au
Nursing Library
88 Mallett St, Camperdown, M02
Phone: (02) 9351 0541
Fax: (02) 9351 0634
Email: nursing@library.usyd.edu.au
Orange Library
Leeds Parade, Orange
Phone: (02) 6360 5594
Fax: (02) 6360 5637
Email: lib@orange.usyd.edu.au
Physics Library
New Wing, Physics Building, A29
Phone: (02) 9351 2550
Fax: (02) 9351 7767
Email: physics@library.usyd.edu.au
Shaeffer Fine Arts Library
Mills Building, A26
Phone: (02) 9351 2148
Fax: (02) 9351 7624
Email: john.spencer@arthist.usyd.edu.au
Sydney College of the Arts Library
Balmain Rd, Rozelle, N01
Phone: (02) 9351 1036
Fax: (02) 9351 1043
Email: scalib@sca.usyd.edu.au
Sydney Conservatorium of Music Library
Macquarie St (opposite Bridge St), Sydney, C41
Phone: (02) 9351 1316
Email: library@conmusic.usyd.edu.au

Mathematics Learning Centre

The Mathematics Learning Centre runs bridging courses in mathematics at the beginning of the academic year (fees apply). It also provides on-going support during the year through individual assistance and small group tutorials.
Level 4, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4061
Fax: (02) 9351 5797
TTY: (02) 9351 3412
Email: mlc@stuserv.usyd.edu.au
Web: www.usyd.edu.au/su/mlc

Part-time, full-time

Students are normally considered as full-time if they have a HECS weighting 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.

Privacy

The University is subject to the NSW Privacy and Personal Information Protection Act 1998 (the Act). Central to the Act is Part 2 which contains twelve Information Protection Principles (IPPs) which regulate the collection, management, use and disclosure of personal information.

In response to Section 33 of the Act the University has developed a Privacy Management Plan which includes a new University Privacy Policy incorporating the requirements of the IPPS. Both the Plan and the new University Privacy Policy were endorsed by the Vice-Chancellor on 28 June 2000. The Privacy Management Plan sets out the IPPs and how they apply to functions and activities carried out by the University.

Further information and a copy of the Plan may be found at www.usyd.edu.au/arms/privacy/. Any questions regarding the Freedom of Information Act, the Privacy and Personal Information Protection Act or the Privacy Management Plan should be directed to:
Tim Robinson: (02) 9351 4263 or
Judith Russell: (02) 9351 2684
Email: foi@mail.usyd.edu.au

Student Centre

Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3023 General Enquiries
(02) 9351 4109 Academic Records
(02) 9351 3023 Discontinuation of Enrolment
(02) 9351 5057 Handbooks
(02) 9351 5060 Prizes
Fax: (02) 9351 5081, (02) 9351 5350 Academic Records

Student identity cards

In 1999 the University incorporated a photograph into the student identity card. This means that all students have to provide a colour, passport-sized, head and shoulders photograph when they attend on campus sites to have their student ID card laminated. University student ID cards also function as transport concession cards for eligible students, thus eliminating the need for a separate concession card. The endorsement for concession travel will take the form of a hologram sticker attached to the front of the student ID card.

Student Services

Student Services exists to help you achieve your educational goals by providing personal, welfare, and academic support services to facilitate your success at University. Many factors can impact on your well being while studying at University and Student Services can assist you in managing and handling these more effectively. Refer to Accommodation Service, Casual Employment Service, Child Care, Disability Service, Financial Assistance Office, Learning Centre, Mathematics Learning Centre. The web site is at www.usyd.edu.au/su/stuserv.

The Sydney 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 on 2 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.

Timetabling Unit

The timetabling unit in the Student Centre is responsible for producing students' class and tutorial timetables. Students can obtain their Semester 1 timetables from the Wednesday of Orientation Week via the web.

The Sydney Conservatorium of Music operates in accordance with a local calendar of dates and produces a complete timetable

for all teaching that it delivers. The timetable is available on enrolment at the Conservatorium.

Undergraduate Scholarships

Scholarships Unit, Room 147
Ground Floor, Mackie Building, KOI
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2717
Fax: (02) 9351 5134
Email: scholarships ©careers.usyd.edu.au
Web: www.usyd.edu.au/study/

University Health Service

Provides full general practitioner services and emergency medical care to the University community.

. Email: director@unihealth.usyd.edu.au
Web: www.unihealth.usyd.edu.au

University Health Service (Wentworth)
Level 3, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3484
Fax: (02) 9351 4110

University Health Service (Holme)
Science Rd Entry, Holme Building, A09
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4095
Fax: (02) 9351 4338

■ Student organisations

Students' Representative Council

Level 1, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9660 5222 Editors, Honi Soit/Legal Aid
(02) 9660 4756 Second-hand Bookshop
(02) 9351 0691 Mallett St
(02) 9230 3777 Pitt St - Conservatorium
Fax: (02) 9660 4260
Email: postmaster@src.usyd.edu.au

Sydney University Sports Union

Services, facilities and clubs for sport, recreation and fitness.

Noel Martin Sports and Aquatic Centre, G09
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4960
Fax: (02) 9351 4962
Email: sports_union@susu.usyd.edu.au

University of Sydney Union

Main provider of catering facilities, retail services, welfare programs, and social and cultural events for the University community on the Camperdown and Darlington campuses, and at many of the University's affiliated campuses.

University of Sydney Union
Box 500, Holme Building, A09
The University of Sydney
NSW 2006 Australia
Phone: (02) 9563 6000 Switchboard/Enquiries
Fax: (02) 9563 6239
Email: email@usu.usyd.edu.au
Web: www.usu.usyd.edu.au

Women's Sports Association

Provides for students, predominantly women, to participate in sport and recreation through the provision of facilities, courses and personnel.

The Arena Sports Centre, A30
The University of Sydney
NSW 2006 Australia
Phone: (02)9351 8111
Fax: (02) 9660 0921
Email: secretary@suwsa.usyd.edu.au
Web: www.suwsa.usyd.edu.au

Glossary

This glossary describes terminology in use at The University of Sydney.

Academic Board

The Academic Board is the senior academic body within the University. In conjunction with faculties, the Academic Board has responsibility for approving, or recommending to Senate for approval, new or amended courses and units of study and policy relating to the admission of students. (For further information, see the University Calendar.)

Academic cycle

The academic cycle is the program of teaching sessions offered over a year. Currently the cycle runs from the enrolment period for Semester 1 through to the completion of the processing of results at the end of Semester 2. (See also *Stage.)*

Academic record

The academic record is 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. A student's academic record is not released to a third party without the written authorisation of the student. (See also *Academic transcript.)*

Academic transcript

An academic transcript is 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 *External transcript, Internal transcript.)*

Academic year

An academic year is a normal full-time program taken in a course in a year. Some courses consist of stages, which may readily be equated with academic year. Others use the aggregation of credit points to do this (eg, 48 credit points = an academic year). (See *also Academic cycle, Stage.)*

Addresses

All enrolled students need to have a current postal address recorded on FlexSIS to which all official University correspondence is sent. (See also *Business address, Permanent home address, Semester address, Temporary address.)*

Admission

Admission is governed by the University's admission policy and is the process for identifying applicants eligible to receive an initial offer of enrolment in a course at the University. Admission to most courses is based on performance in the HSC with applicants ranked on the basis of their UAI. Other criteria such as a portfolio, interview, audition, or results in standard tests may also be taken into account for certain courses.

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 Universities Admission Index (UAI).

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.

Admission mode

Admission mode is 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. The main admission period takes place before Semester 1, but there may also be an admission period for mid-year applicants before the beginning of Semester 2 and other admission periods.

Admission reply

A code used by FlexSIS to indicate whether an applicant who has received an offer has accepted the offer or not.

Admission result

A code used by FlexSIS to indicate the result of a direct application to study at the University (eg, offer, unsuccessful, withdrawn).

Admission year

The year the student began the course.

Advanced diplomas

See Award course.

Advanced standing

See *Credit.*

Advisor

A member of academic staff appointed in an advisory role for some postgraduate coursework students. (See also *Associate supervisor, Instrumental supervisor (teacher), Research supervisor, Supervision.)*

Annual Progress Report

The Annual Progress Report is a form issued by faculties which is 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 nominee). The completed form is attached to the student's official file.

FlexSIS records that the form has been sent out and that it has been satisfactorily completed.

APA

Australian Postgraduate Awards. (See also *Scholarships, UPA.)*

Appeals

Students may lodge appeals against academic or disciplinary decisions. FlexSIS will record an academic appeal (eg, against exclusion) while they are under consideration and will record the outcome of the appeal. Disciplinary (that is, non-academic) appeals are not recorded on FlexSIS.

ARTS

Automated Results Transfer System. This system was developed on behalf of ACTAC (Australasian Conference of Tertiary Admissions Centres) to allow the electronic academic record of a student to be accessible, via an admission centre, between tertiary institutions.

Assessment

The process of measuring the performance of students in units of study and courses. The assessment of performance in a unit of study may include examinations, essays, laboratory projects, or assignments. (See *also Board of examiners, Result processing, Result processing schedule.)*

Associate supervisor

A person who is appointed in addition to the supervisor of a research student who can provide the day-to-day contact with the candidate or provide particular expertise or additional experience in supervision. (See *also Advisor, Instrumental supervisor (teacher), Research supervisor, Supervision.)*

Assumed knowledge

For some units of study, a student is assumed to have passed a relevant subject at the HSC and 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 the unit of study. (See also *Prerequisite.)*

Attendance mode

A DETYA classification defining the manner in which a student is undertaking a course - ie, internal, external, mixed or offshore.

Attendance pattern/type

Refers to whether the student is studying part-time or full-time. For coursework students this is a function of course load - ie, the

proportion being undertaken by the student of the normal full-time load specified for the course in which the student is enrolled. To be considered full-time, a coursework student must undertake at least 0.75 of the normal full-time load over the academic cycle or at least 0.375 if only enrolling in half of an academic year. It is important to note, however, that, for some purposes, to be considered full-time a student may need to be enrolled in at least 0.375 in each half year. Research students, with the approval of their faculty, nominate whether they wish to study part-time or full-time. The attendance status is then recorded on FlexSIS as part of the application or enrolment process. (See also *Coursework, Student load.)*

AusAID

Australian Agency for International Development.

AUSCHECK

AUSCHECK is the software provided by Centrelink to validate data prior to reporting to Centrelink.

AUSTUDY

Replaced by Youth Allowance. (See also *Youth Allowance.)*

Award course

An award course is a formally approved program of study that can lead to an academic award granted by the University. An award course requires the completion of a program of study specified by course rules. (See also *Course rules.)* Award courses are approved by Senate, on the recommendation of the Academic Board. Students normally apply to transfer between Award courses through the UAC. The award course name will appear on testamurs. The University broadly classifies courses as undergraduate, postgraduate coursework or postgraduate research. The award courses offered by the University are:

Higher doctorates
Doctor of philosophy (PhD)
Doctorates by research and advanced coursework
Master's degree by research
Master's degree by coursework
Graduate diploma
Graduate certificate
Bachelor's degree
Advanced diplomas
Diplomas
Certificates

(See also *Bachelor's degree, Course rules, Diploma, Doctorate, Major, Master's degree, Minor, PhD, Stream.)*

Bachelor's degree

The highest undergraduate award offered at the University of Sydney. A bachelor's degree course normally requires three or four years of full-time study or the part-time equivalent. (See also *Award course)*

Barrier

A barrier is an instruction placed on a student's FlexSIS record that prevents the student from re-enrolling or graduating. (See also *Deadline (fees), Suppression of results.)*

Board of examiners

A Board of examiners was a body appointed by a faculty or board of studies which met to approve the results of all students undertaking courses supervised by that faculty or board of studies. Boards of examiners were dis-established following revision of the University's examination procedures in 2000. (See also *Assessment, Result processing, Result processing schedule.)*

Board of studies

An academic body which supervises a course or courses and which is similar to a faculty except that it is headed by a chair rather than a dean and does not supervise PhD candidates.

Bursaries

See *Scholarships.*

Business address

FlexSIS can record a student's business address and contact details. (See also *Addresses, Permanent home address, Semester address, Temporary address.)*

Cadigal Program

The Cadigal Program is a University wide access and support scheme for Aboriginal and Torres Strait Islanders.

Campus

The grounds on which the University is situated. There are eleven campuses of the University of Sydney: Burren Street (Institute for International Health, Institute of Transport Studies), Camperdown and Darlington (formerly known as Main Campus), Camden (Agriculture and Veterinary Science), Conservatorium (Conservatorium of Music), Cumberland (Health Sciences), Mallett Street (Nursing), Orange (Faculty of Rural Management), Rozelle (Sydney College of the Arts), St James (Law) and Surry Hills (Dentistry).

Census date

See HECS census date.

Centre for Continuing Education

The Centre for Continuing Education develops and conducts courses, conferences and study tours for the general public and professional groups. The Centre offers approximately 1,000 courses for approximately 20,000 students each year. Most of these courses are held over one of the four main sessions that are conducted each year, though the Centre is offering an increasing number of ad hoc courses in response to increased competition and changing demands. The Centre operates on a cost recovery/ income generation basis. (See also *Continuing professional education)*

Centrelink

Centrelink is the agency responsible for providing information and assistance on a range of Commonwealth Government programs including Youth Allowance. (See also *Youth Allowance)*

Ceremony

See *Graduation ceremony.*

Chancellor

The non-executive head of the University. An honorary position, the Chancellor chairs meetings of the University's governing body, the Senate, and presides over graduation ceremonies amongst other duties.

Class list

A listing of all currently enrolled students in a particular unit of study. (See also *Unit of study.)*

Combined course

A course which leads to two awards. For example the Arts/Law course leads to the separate awards of Bachelor of Arts and Bachelor of Laws.

Combined degree

See *Combined course.*

Commencing student

A student enrolling in an award course at the University of Sydney for the first time. The DETYA glossary provides a more detailed definition.

Comp subs

See *Compulsory subscriptions.*

Compulsory subscription rates

There are two rates for some annual subscriptions: full-time and part-time. (See also *Compulsory subscriptions.)*

Compulsory subscription waiver provision

Certain students over a certain age or with disabilities or medical conditions may be exempted from the subscription to the sports body.

Students with a conscientious objection to the payment of subscriptions to unions of any kind may apply to the Registrar for exemption. The Registrar may permit such a student to make the payment to the Jean Foley Bursary Fund instead. (See also *Compulsory subscriptions.)*

Compulsory subscriptions

Each enrolled student is liable to pay annual (or semester) subscriptions as determined by the Senate to the student organisations at the University. These organisations are different on different campuses. There are different organisations for undergraduate and postgraduate students.

At the Camperdown/Darlington campus (formerly known as Main Campus), compulsory submissions depend on the level of study.

Undergraduate: the University of Sydney Union, Students' Representative Council (SRC) and the University of Sydney Sports Union or the Sydney University Women's Sports Association.

Postgraduate: the University of Sydney Union and the Sydney University Postgraduate Representative Association (SUPRA).

Student organisations at other campuses include: the Conservatorium Student Association, the Cumberland Student Guild, the Orange Agricultural College Student Association and the Student Association of Sydney College of the Arts.

(See also *Compulsory subscription rates, Compulsory subscription waiver provision, Joining fee, Life membership.)*

Confirmation of Enrolment form

A Confirmation of Enrolment form is issued to students after enrolment showing the course and the units of study they are enrolled in, together with the credit point value of the units of study and the HECS weights. Until all fees are paid, it is issued provisionally.

A new Confirmation of Enrolment form is produced every time a student's enrolment is varied.

For postgraduate research students the form also lists candidature details and supervisor information.

Where students have an appointed advisor, the advisor information is also shown.

Continuing professional education

The continuing professional education process provides a number of programs of continuing education courses for professionals as they move through their career. These programs are presently administered by the Centre for Continuing Education and a number of departments and Foundations across the University. This process supports the whole of life learning concept and requires/promotes the maintenance of a long term relationship between the student and the University. It is envisaged that the importance of this mode of education will increase in the future. (See also *Centre for Continuing Education.)*

Convocation

Convocation is the body comprising all graduates of the University.

Core unit of study

A unit of study that is compulsory for the course or subject area. (See also *Unit of study.)*

Corequisite

A corequisite is a unit of study which 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.)*

Course

An award course or non-award course undertaken at the University of Sydney. (See also *Award course, Non-award course.)*

Course alias

Each course in FlexSIS is identified by a unique five-digit alpha-numeric code.

Course code

See *Course alias.*

***Course** leave*

Students (undergraduate and postgraduate) 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 and recorded on FlexSIS (leave for periods of less than one semester should be recorded internally by the faculty). 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 reapply formally for admission. The term 'suspension of candidature' was previously used to describe research students on course leave.

Course (research)

A classification of courses in which students undertake supervised research leading to the production of a thesis or other piece of written or creative work over a prescribed period of time. The research component of a research course must comprise 66% or more of the overall course requirements.

Course rules

Course rules govern the allowable enrolment of a student in a course; eg, a candidate may not enrol in units of study having a total value of more than 32 credit points per semester. Course rales also govern the requirements for the award of the course - eg, a candidate must have completed a minimum of 144 credit points. Course rules may be expressed in terms of types of units of study taken, length of study, and credit points accumulated. (See also *Award course.)*

Course suspension

See *Course leave.*

Course transfer

A course transfer occurs where a student changes from one course in the University to another course in the University without the requirement for an application and selection (eg, from a PhD to a master's program in the same faculty).

Course type

Course type is a DETYA code.

Coursework

Coursework is a classification used to describe those courses that consist of units of study rather than research work. All undergraduate courses are coursework programs. Postgraduate courses can be either research courses or coursework courses. (See also *Course (research).)*

Credit

The recognition of previous studies successfully completed at this or another recognised (by the University of Sydney) university or tertiary institution as contributing to the requirements for the award of the course in which the applicant requesting such recogmtion has been admitted.

Where the University agrees to recognise successfully completed previous studies, their contribution to the requirements for the award of the course, in which the applicant has been admitted, will be expressed as specific or non-specific credit.

Credit awarded to a credit applicant - whether specific or non-specific - will be recorded with a mark and grade of 50 pass, unless in individual cases the credit is assessed by the faculty as having a mark and grade greater than 50 pass. This equivalent mark and grade will be used for the purposes of calculating a student's weighted average mark and for the purposes of satisfying prerequisite rules where a level of passing grade is specified.

(See also *Precedents, Specific credit, Non-specific credit, Waiver, Weighted average mark (WAM).)*

Credit points

Credit points are a measure of value indicating the contribution each unit of study provides towards meeting course completion requirements stated as a total credit point value. Each unit of study will have a credit point value assigned to it, normally in the range 3 to 24. Resolutions of Senate set the number and level of credit points required for graduation.

Cross-institutional enrolment

Cross-institutional enrolment is an enrolment in units of study at one university to count towards an award course at another university. Cross-institutional enrolments incur a HECS liability or tuition fee charge at the institution at which the unit of study is being undertaken. Students pay compulsory subscriptions to one university only (usually their home university - ie, the university which will award their degree). (See also *Non-award course, Enrolment non-award.)*

DAC (Data Audit Committee)

DAC is a sub-committee of the VCAC Enrolment Working Party, chaired by the Registrar, with membership including the deans, the Student Centre, FlexSIS and the Planning Support Office. Its role is to oversee the integrity and accuracy of the course and unit of study data as strategic university data. It has a role in advising the Academic Board on suggested policy changes with relation to course and unit of study data.

Deadlines (enrolment variations)

See *Enrolment variations.*

Deadlines (fees)

The University has deadlines for the payment of fees (eg, HECS, compulsory subscriptions, course fees, etc). 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 *Barrier.)*

Dean

The head of a faculty or the principal or director of a college (such as the Conservatorium of Music or the Sydney College of Arts).

Dean's certificate

A statement from the 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

See Admission (deferment), Leave.

Degree

(See also Award course, Bachelor's degree.)

Delivery mode

Indicates the mode of delivery of the instruction for a unit of study - eg, normal (ie, by attending classes at a campus of the University), distance (ie, remotely by correspondence or other distance means - eg, Web delivery). The delivery mode must be recorded for each unit as distinct from the attendance mode of the student - ie, an internal student may take one or more units by distance mode and an external student may attend campus for one or more units.

Department

For the purposes of FlexSIS, a department is the academic unit, which is 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.

DETYA

The Department of Education Training and Youth Affairs is the Commonwealth Government department responsible for higher education. The University is required to provide DETYA with information about its students three times a year. The Government in its funding deliberations uses this information.

Differential HECS

See *Higher Education Contribution Scheme (HECS).*

Diploma

The award granted following successful completion of diploma course requirements. A diploma course usually requires less study than a degree course. Graduate diploma courses are only available to students who already hold an undergraduate degree. (See also *Award* course.)

Direct admissions

For some courses, applications may be made direcdy to the University. Applications are received by faculties or the International Office, registered on FlexSIS and considered by the relevant department or faculty body. Decisions are recorded on FlexSIS and FlexSIS produces letters to applicants advising them of the outcome. (See also *Admission, UAC admissions.)*

Disability information

Students may inform the University of any temporary or permanent disability, other than a financial disability, which affects their life as a student. Disability information is recorded in FlexSIS but it is only visible to particular authorised users because of its sensitive nature.

Discipline codes

Discipline codes are four-letter codes for each area of study available at the university (eg, CHEM Chemistry, ECON Economics).

Discipline group

A DETYA 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 dissertation is a written exposition of a topic and 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 Architecture and Law.

Distance and flexible learning

Distance and flexible learning affords the opportunity to provide higher education to a much wider market- including students from anywhere in the world- at times, locations and modes that suit them.

Doctor of philosophy (PhD)

See. Award course, Doctorate, PhD.

Doctorate

The doctorate and the PhD are high-level postgraduate awards available at the University of Sydney. A doctorate course normally involves research and coursework; the candidate submits a thesis that is an original contribution to the field of study. Entry to a doctorate course often requires completion of a master's degree course. Note that the doctorate course is not available in all departments at the University of Sydney. (See also *Award course, PhD.)*

Earliest date

See *Research candidature.*

EFTSU

The equivalent full-time student unit (EFTSU) is a measure of student load expressed as a proportion of the workload for a standard annual program for a student undertaking a full year of study in a particular award course. A student undertaking the standard annual program of study (normally 48 credit points) generates one EFTSU.

EFTYR

The effective full-time enrolment year (EFTYR) is a calculation of how long, in terms of equivalence to full-time years of enrolment, a student has been enrolled in a course. If a student has always been full-time, the calculation is straightforward (eg, the fifth year of enrolment is EFTYR 5). If the student has had a mixture of part-time and full-time enrolment, this can be equated with an EFTYR. (See also *Stage.)*

Enrolment

A student enrolls in a course by registering with the supervising faculty in the units of study to be taken in the coming year, semester or session. The student pays whatever fees are owing to the University by the deadline for that semester. New students currently pay on the day they enrol which is normally in early February. Students already in a course at the University re-enrol each year or semester; for most students pre-enrolment is required. (See also *Pre-enrolment.)*

Enrolment non-award

Non-award enrolment is an enrolment in a unit or units of study, which does not count towards a formal award of the University. Non-award enrolments are recorded in various categories used for reporting and administrative purposes. (See also *Cross-institutional enrolment, Non-award course.)*

Enrolment status

A student's enrolment status is either 'enrolled' or 'not enrolled'. An enrolment status is linked to an enrolment status reason or category.

Enrolment status reason/ category

Not enrolled status reasons/categories include: withdrawn, totally discontinued, cancelled, on leave (suspended), transferred, lapsed, terminated, qualified and conferred.

Enrolment variation

Students may vary their enrolment at the beginning of each semester. Each faculty determines its deadlines for variations, but HECS liability depends on the HECS census date. (See also ***HECS.)***

Enrolment year

See EFTYR, Stage.

Examination

See *Examination paper code, Examination period, Supplementary exams.*

Examination paper code

A code that identifies each individual examination paper. Used to help organise examinations.

Examination period

The examination period is the time set each semester for the conduct of formal examinations.

Exchange student

An exchange student is either a student of the University of Sydney who is participating in a formally agreed program involving study at an overseas university or an overseas student who is studying here on the same basis. The International Office provides administrative support for some exchanges.

Exclusion

The faculty may ask a student whose academic progress is considered to be unsatisfactory to 'show 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. 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 exclusion is set out in the University Calendar. (See also *Senate appeals.)*

Extended semesters

Distance learning students may be allowed more time to complete a module/program if circumstances are beyond the student's control - eg, drought, flood or illness, affect the student's ability to complete the module/program in the specified time.

External

See Attendance mode.

External transcript

An external transcript is 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 and the final course result and all units of study attempted within each course together with the result (but not any unit of study which has the status of withdrawn). It also includes any scholarships or prizes the student has received. Two copies are provided to each student on graduation (one with marks and grades for each unit of study and one with grades only). External transcripts are also produced at the request of the student. The student can elect either to have marks appear on the transcript or not. (See also *Academic transcript, Internal transcript.)*

Faculty

A faculty, consisting mainly of academic staff members and headed by a dean, is a formal part of the University's academic governance structure, responsible for all matters concerning the award courses that it supervises (see the 2001 University Calendar, pp. 140-141). Usually, a faculty office administers the faculty and student or staff inquiries related to its courses. The Calendar sets out the constitution of each of the University's 17 faculties. (See also *Board of studies, Supervising faculty.)*

Fail

A mark of less than 50% which is not a concessional pass. (See also *Results.)*

Fee-paying students

Fee-paying students are students who pay tuition fees to the University and are not liable for HECS.

Fee rate

Local fees are charged in bands, a band being a group of subject areas. The bands are recommended by faculties and approved by the DV-C (Planning and Resources).

Fee type

Fee type can be 'international' or 'local'.

Flexible learning

See *Distance* and *Flexible learning.*

Flexible start date

Full fee-paying distance students should not be restricted to the same enrolment time frames as campus-based or HECS students.

FlexSIS

FlexSIS is the computer-based Flexible Student Information System at the University of Sydney. Electronically 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. FlexSIS also holds the complete academic records of many (but not all) past students of the university. For past students whose complete records are not held on FlexSIS, there will be a reference on FlexSIS to card or microfiche records where details are kept.

Full-time student

See *Attendance status, EFTSU.*

Grade

A grade is a result outcome for a unit of study normally linked with a mark range. For example, in most faculties, a mark in the range 85-100 attracts the grade 'high distinction' ('HD'). (See also *Mark.)*

Graduand

A Graduand is a student who has completed all the requirements for an award course but has not yet graduated. (See also *Graduation, Potential graduand.)*

Graduate

A graduate is a person who holds an award from a recognised tertiary institution. (See also *Graduand, Graduation.)*

Graduate certificate

See *Award course.*

Graduate diploma

See *Award course.*

Graduate register

The graduate register is a list of all graduates of the University. (See also *Graduation.)*

Graduation

Graduation is the formal conferring of awards either at a ceremony or in absentia. (See also *In absentia, Potential graduand.)*

Graduation ceremony

A graduation ceremony is a ceremony where the ChanceEor confers awards upon graduands. The Registrar publishes annually the schedule of graduation ceremonies.

HECS

See *Higher Education Contribution Scheme (HECS).*

HECS census date

The date at which a student's enrolment, load and HECS liability are finalised before reporting to DETYA. The following dates apply:

Semester 1:31 March

Semester 2:31 August.

HECS code

A code used by DETYA to identify the HECS status of a student (eg, 10 deferred, 11 upfront).

Higher doctorates

See *Award* course.

Higher Education Contribution Scheme (HECS)

All students, except international students, local fee-paying students and holders of certain scholarships are obliged to contribute towards the cost of their education under the Higher Education Contribution Scheme (HECS). HECS liability depends on the load being taken.

Current students, except possibly those who began their studies prior to 1997, have a HECS rate charged for each unit of study in their degree program which depends on the 'discipline group' it is in, and the 'band' to which the Government has assigned it. Theses are all determined annually by the Government.

Honorary degrees

A degree *honoris causa* (translated from the Latin as 'for the purpose of honouring') is an honorary award, which is conferred on a person whom the University wishes to honour.

A degree *ad eundem gradum* (translated as 'at the same level') is awarded to a member of the academic staff who is not a graduate of the University in recognition of outstanding service to the University. The award of an honorary degree is noted on the person's academic record.

Honours

Some degrees may be completed 'with Honours'. This may involve either the completion of a separate Honours year or additional work in the later years of the course or meritorious achievement over all years of the course. Honours are awarded in a class (Class 1, Class n, Class IE) and sometimes there are two divisions within Class II.

HSC

The HSC is the NSW Higher School Certificate, which is normally completed at the end of Year 12 of secondary school. The UAI (Universities Admission Index) is a rank out of 100 that is computed from a student's performance in the HSC.

In absentia

In absentia is Latin for 'in the absence of. Awards are conferred in absentia when a graduand does 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 Conservatorium of Music and BMus students on the Camperdown campus have an instrumental teacher appointed. (See also *Advisor, Associate supervisor, Research supervisor, Supervision.)*

Internal

See Attendance mode.

Internal transcript

An Internal transcript is a record of a student's academic record for the University's own internal use. It includes the student's

name, 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

An International student is required to hold a visa to study in Australia and may be liable for international tuition fees. Any student who is not an Australian or New Zealand citizen or a permanent resident of Australia is an international student. New Zealand citizens are not classified as international students but have a special category under HECS that does not permit them to defer their HECS liability. (See also *Local student, Student type)*

Joining fee

Students enrolling for the first time pay, in addition, a joining fee for the University of Sydney Union or equivalent student organisation. (See also *Compulsory subscription.)*

Leave

See *Course leave.*

Life membership

Under some circumstances (eg, after five full-time years of enrolments and contributions) students may be granted life membership of various organisations, which means they are exempt from paying yearly fees. (See also Compulsory subscription.)

Load

Load for an individual student is the sum of the weights of all the units of study in which the student is enrolled. (See also EFTSU, HECS.)

Local student

A local student is either an Australian or New Zealand citizen or Australian permanent resident. New Zealand citizens are required to pay their HECS upfront. (See also Fee type, HECS, International student.)

Major

A major is a defined program of study, generally comprising 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 prescribed in order to satisfy course requirements. Majors may be included on testamurs. (See *also Award course, Minor, Stream.)*

Major timetable clash

Used by FlexSIS to denote occasions when a student attempts to enrol in units of study which have so much overlap in the teaching times that it has been decided that students must not enrol in the units together.

Mark

An integer (rounded if necessary) between 0 and 100 inclusive, 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 *Award course.)*

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, Course (research), Coursework.)*

Minor

A minor is a defined program of study, generally comprising units of study from later stages of the award course and requiring a 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 prescribed in order to satisfy course requirements. Minors may be included on testamurs. (See also *Award course, Major, Stream.)*

Minor timetable clash

Used by FlexSIS to denote occasions when a student attempts to enrol in units of study which have some identical times of teaching.

Mixed mode

See Attendance mode.

Mode

See Attendance mode and *Delivery mode.*

Mutually exclusive units of study

See *Prohibited combinations of units of study.*

MyUni

MyUni is a personalised space for staff and students on the University of Sydney's intranet, called USYDnet. MyUni is used to deliver information and services directly through a central location, while also allowing users to customise certain information. Students are able to access such services as exam seat numbers, results, timetables and FlexSIS pre-enrolment and enrolment variations on MyUni. (See also *UsydNet.)*

Non-award course

Non-award courses are courses undertaken by students who are not seeking an award from the University. These may be students enrolled in an award course at another institution or students not seeking an award from any institution. Non-award courses are assigned a course code in the same way as award courses. A separate course code is assigned for each faculty, level (undergraduate or postgraduate) and method (research or coursework) which offers a non-award course. Various categories of non-award enrolment are recorded on FlexSIS for reporting and administrative purposes.(See also *Course, Cross-institutional enrolment, Enrolment non-award.)*

Non-award enrolment

See *Enrolment non-award.*

Non-specific credit

Non-specific credit is awarded when previous studies are deemed to have satisfied defined components of a course other than named units of study. These components include, but are not limited to:

- entire years in courses that progress through the successful completion of a set of prescribed units of study per year
- a set number of credit points within a particular discipline or level (ie, first, second or third year)
- one or more semesters for research courses.

(See also *Credit, Specific credit.)*

OPRS

Overseas Postgraduate Research Scholarship.

Orientation Week

Orientation or 'O Week', takes place during the week prior to lectures in Semester 1. 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.

Part-time student

See *Attendance status, EFTSU.*

Permanent home address

The permanent home address is the address for all official University correspondence both inside and outside of semester time (eg, during semester breaks), unless overridden by semester address. (See also *Addresses, Business address, Semester address, Temporary address.)*

PhD

The Doctor of Philosophy (PhD) and other doctorate awards are the highest awards available at the University of Sydney. A PhD course is normally purely research-based; the candidate submits a thesis that is an original contribution to the field of study. Entry to a PhD course often requires completion of a master's degree course. Note that the PhD course is available in most departments in the University of Sydney. (See also *Award course, Doctorate.)*

Postgraduate

A term used to describe a course leading to an award such as graduate diploma, a master's degree or PhD, which usually requires prior completion of a relevant undergraduate degree (or diploma) course. A 'postgraduate' is a student enrolled in such a course.

Potential graduand

Potential graduands are students who have been identified as being eligible to graduate on the satisfactory completion of their current studies. (See also *Graduand, Graduation.)*

Precedents

Where a credit applicant has credit approved in terms of the granting of specific or non-specific credit on the basis of study previously taken, a precedent is established at system level. Any other credit applicant subsequently seeking credit on the basis of the same pattern of previous study will be eligible to have the item of credit to be immediately approved on the basis of the previously approved precedent. (See also *Credit.)*

Pre-enrolment

Pre-enrolment takes place in October for the following year. Students indicate their choice of unit of study enrolment for the following year. After results are approved, registered students are regarded as enrolled in those units of study they chose and for which they are qualified. Their status is 'enrolled' and remains so provided they pay any money owing or comply with other requirements by the due date. Re-enrolling students who do not successfully register 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. Pre-enrolment is also known as provisional re-enrolment. (See also *Enrolment)*

Prerequisite

A prerequisite is a unit of study that is required to be completed before another unit of study can be attempted. (See also *Assumed knowledge, Corequisite, Waiver.)*

Prizes

Prizes are awarded by the University, a faculty or a department for outstanding academic achievement. Full details can be found in the University Calendar.

Probationary candidature

A probationary candidate is a student who is enrolled in a postgraduate course on probation for a period of time up to one year. The head of department 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.

Progression

See *Course progression.*

Prohibition (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. A unit related in this way to any other unit is linked in tables of units of study via use of the symbol N to identify related prohibited units.

Provisional re-enrolment

See *Pre-enrolment.*

Qualification

A qualification is an academic attainment recognised by the University.

Registrar

The Registrar is responsible to the Vice-Chancellor for the keeping of official records and associated policy and procedures within the University. (See the University Calendar for details.)

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 person will be a full-time member of the academic staff or a person external to the University appointed in recognition of their association with the clinical teaching or the research work of the University. A research supervisor is commonly referred to as a supervisor. (See also *Advisor, Associate supervisor, Instrumental supervisor (teacher), Supervision.)*

Resolutions of Senate

Regulations determined by the Senate of the University of Sydney that pertain to degree and diploma course requirements and other academic or administrative matters.

Result processing

Refers to the processing of assessment results for units of study. Departments tabulate results for all assessment activities of a unit of study and assign preliminary results for each unit of study. Preliminary results are considered by the relevant board of examiners, which approves final results. Students are notified of results by result notices that list final marks and grades for all units of study. (See also *Assessment, Examination period.)*

Result processing schedule

The result processing schedule will be determined for each academic cycle. It is expected that all departments and faculties will comply with this schedule. (See also *Assessment, Examination period, Result processing.)*

Results

The official statement of the student's performance in each unit of study attempted, as recorded on the academic transcript, usually expressed as a grade:

HD	High distinction	a mark of 85-100
D	Distinction	a mark of 75-84
CR	Credit	a mark of 65-74
P	Pass	a mark of 50-64
R	Satisfied requirements	This is used in pass/fail only outcomes
UCN	Unit of study continuing	Used at the end of semester for units of study that have been approved to extend into a following semester. This will automatically flag that no final result is required until the end of the last semester of the unit of study.
PCON	Pass (concessional)	A mark of 46-49. Use of this grade is restricted to those courses that allow for a concessional pass of some kind to be awarded. A student may re-enrol in a unit of study for which the result was PCON. Each faculty will determine and state in its course regulations what proportion, if any, may count - eg, 'no more than one sixth of the total credit points for a course can be made up from PCON results'.
F	Fail	This grade may be used for students with marks of 46-49 in those faculties which do not use PCON
AF	Absent fail	Includes non-submission of compulsory work (or non-attendance at compulsory labs, etc) as well as failure to attend an examination
W	Withdrawn	Not recorded on an external transcript. This is the result that obtains where a student applies to discontinue a unit of study by the HECS census date (ie, within the first four weeks of enrolment).
DNF	Discontinued - not to count as failure	Recorded on external transcript. This result applies automatically where a student discontinues after the HECS Census Date but before the end of the seventh week of the semester (or before half of the unit of study has run, in the case of units of study which are not semester-length). A faculty may determine that the result of DNF is warranted after this date if the student has made out a special case based on illness or misadventure.
DF	Discontinued - fail	Recorded on transcript. This applies from the time DNF ceases to be automatically available up to the cessation of classes for the unit of study.

MINC	Incomplete with a mark of at least 50	This result may be used when examiners have grounds (such as illness or misadventure) for seeking further information or for considering additional work from the student before confirming the final mark and passing grade. Except in special cases approved by the Academic Board, this result will be converted to a normal passing mark and grade either: • by the dean at the review of examination results conducted pursuant to section 2 (4) of the Academic Board policy 'Examinations and Assessment Procedures'; or • automatically to the indicated mark and grade by the third week of the immediately subsequent academic session. Deans are authorised to approve the extension of a MINC grade for individual students having a valid reason for their incomplete status.
INC	Incomplete	This result is used when examiners have grounds (such as illness or misadventure) for seeking further information or for considering additional work from the student before confirming the final result. Except in special cases approved by the Academic Board, this result will be converted to a normal permanent passing or failing grade either: ■ by the dean at the review of examination results conducted pursuant to section 2 (4) of the Academic Board policy 'Examinations and Assessment Procedures'; or • automatically to an AF grade by the third week of the immediately subsequent academic session. Deans are authorised to approve the extension of a MINC grade for individual students having a valid reason for their incomplete status.
UCN	Incomplete	A MINC or INC grade is converted, on the advice of the dean, to UCN when all or many students in a unit of study have not completed the requirements of the unit. The students may be engaged in practicum or clinical placements, or in programs extending beyond the end of semester (eg, Honours).

Scholarships
Scholarships are financial or other forms of support made available by sponsors to assist Australian and international students to pursue their studies at the University. When a student's means are a criterion, scholarships are sometimes called bursaries. (See also *Prizes.)*

School
See *Department.*

SCR
System change request.

Semester
A semester is a session whose dates 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 must be given special permission by the Academic Board.

Semester address
The semester address is the address to which all official University correspondence is sent during semester time, if it is different to the permanent address. Unless overridden by a temporary address all official University correspondence during semester (including Session 4 for students enrolled in Summer School) will be sent to this address. (See also *Addresses, Business address, Permanent home address, Temporary address)*

Senate
The Senate of the University is the governing body of the University. (See the University Calendar.)

Senate appeals
Senate appeals are held for those students who, after being excluded by the faculty from a course, appeal to the Senate for readmission. While any student may appeal to the Senate against an academic decision, such an appeal will normally be heard only after the student has exhausted all other avenues - ie, the department, faculty, board of study and, in the case of postgraduates, the Committee for Graduate Studies. (See also *Exclusion.)*

Session
A session is a teaching period that defines the offering of a unit of study. A session cannot be longer than six months. 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.

Session address
See *Semester address.*

Special consideration
Candidates who have medical or other serious problems, which may affect performance in any assessment, may request that they be given special consideration in relation to the determination of their results.

They can obtain an official form from the Student Centre. The Student Centre stamps the form and the medical or other documentation. The student gives a copy of the material to the Student Centre staff and takes copies to the relevant departments. The student retains the originals. The dates for which special consideration is sought are recorded on FlexSIS and printed on the examination register.

Special permission
See *Waiver.*

Specific credit
Specific credit is awarded when previous studies are entirely equivalent to one or more named units of study offered by the University of Sydney that contribute to the course in which the applicant has been admitted. (See also *Credit, Non-specific* ***credit.)***

Sponsorship
Sponsorship is the financial support of a student by a company or government body. Sponsors are frequently invoiced directly.

SRS
SRS is the student record system responsible, prior to FlexSIS, for the processing of student records. The functions of SRS are gradually being incorporated into FlexSIS. (See also *FlexSIS.)*

Stage
For the purposes of administration, a course may be divided into stages to be studied consecutively. The stages may be related to sessions or they may relate to an academic cycle. Part-time students progress through a course more slowly and would often enrol in the same stage more than once.

Status
Status is a variable for students both with relation to course and unit of study. With relation to course, students can have the status of enrolled or not enrolled. 'Not enrolled' reasons can be: totally discontinued, withdrawn, suspended, cancelled, awarded, etc. With relation to unit of study, students can have the status of CURENR or WITHDN, discontinued, etc.

Stream
A stream is a defined program of study within an award course, which requires the completion of a program of study specified by the course rules for the particular stream, in addition to the core program specified by the course rules for the award course. Students enrolled in award courses that involve streams will have the stream recorded in their enrolment record. Students normally enter streams at the time of admission, although some award courses require students to enrol in streams after the completion of level 1000 units of study. Where permitted to do so by faculty resolution, students may transfer from one stream to another, within an award course, provided they meet criteria approved by the Academic Board on the advice of the faculty concerned. A stream will appear with the award course name on testamurs - eg, Bachelor of Engineering in Civil Engineering (Construction Management). (See also *Award course, Major, Minor.)*

Student ID card
All students who enrol are issued with an identification card. The card includes the student name, SID, the course code, and a library borrower's bar code. The card identifies the student as eligible to attend classes and must be displayed at formal

examinations. It must be presented to secure student concessions and to borrow books from all sections of the University Library.

Student identifier (SID)

A 9-digit number which uniquely identifies a student at the University.

Student load

See *Load.*

Study Abroad Program

A scheme administered by the International Education Office which 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 their 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 - eg, 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'.

Summer School

See *Sydney Summer School.*

Supervising faculty

The supervising faculty is the faculty which has the responsibility for managing the academic administration of a particular course - ie, 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 at any given time. Further, 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.

The International Office has a supporting role in the administration of the candidatures of international students and alerts the supervising faculty to any special conditions applying to these candidatures (eg, that enrolment must be full-time). (See also *Board of studies.)*

Supervision

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 position. (See also *Advisor, Associate supervisor, Instrumental supervisor (teacher), Research supervisor.)*

Supplementary examinations

Supplementary exams may be offered by faculties to students who fail to achieve a passing grade or who were absent from assessment due to illness or misadventure.

Suppression of results

Results for a particular student can be suppressed by the University for the following reasons:

- the student has an outstanding debt to the university
- the student is facing disciplinary action.

Suspension

See *Course leave.*

Sydney Summer School

Sydney Summer School is a program of accelerated, intensive study running for approximately 6 weeks during January and February each year. Both undergraduate and postgraduate units are offered. Summer School provides an opportunity for students at Sydney and other universities to catch up on needed units of study, to accelerate completion of a course or to undertake a unit that is outside their award course. All units are full fee-paying and enrolled students are also liable for compulsory subscriptions. Some fee-waiver scholarships are available.

Teaching department

See *Department.*

Temporary address

Students may advise the University of a temporary address. Correspondence will be sent to this address between the dates specified by the student. (See also *Addresses, Business address, Permanent home address, Semester address.)*

Testamur

A testamur is a certificate of award provided to a graduate usually at a graduation ceremony.

Thesis

A thesis is a major work that is the product of an extended period of supervised independent research. 'Earliest date' means the earliest date at which a research student can submit the thesis. 'Latest date' means the latest date at which a research student can submit the thesis.

Timetable

Timetable refers to the schedule of lectures, tutorials, laboratories and other academic activities that a student must attend.

Transcript

See *Academic transcript.*

Transfer

See *Course transfer.*

Tuitionfees

Tuition fees may be charged to students in designated tuition fee-paying courses. Students who pay fees are not liable for HECS.

VAC

The Universities Admissions Centre (UAC) receives and processes applications for admission to undergraduate courses at recognised universities in NSW and the ACT. Most commencing undergraduate students at the University apply through UAC.

UAC admissions

Most local undergraduates (including local undergraduate fee payers) apply through the Universities Admission Centre (UAC).

The University Admissions Office coordinates the processing of UAC applicants with faculties and departments and decisions are recorded on the UAC system.

Applicants are notified by UAC and an electronic file of applicants who have been made offers of admission to courses at the University is loaded onto FlexSIS. (See also *Admission, Direct admissions.)*

UAI (Universities Admission Index)

The Universities Admission Index (UAI) is a number between 0.00 and 100.00 with increments of 0.05. It provides a measure of overall academic achievement in the HSC that assists universities in ranking applicants for university selection. The UAI is based on the aggregate of scaled marks in ten units of the HSC.

Undergraduate

A term used to describe a course leading to a diploma or bachelor's degree. An 'undergraduate' is a student enrolled in such a course.

Unit of study

A unit of study is the smallest stand-alone component of a student's course that is recordable on a student's transcript. Units of study have an integer credit point value, normally in the range 3-24. Each approved unit of study is identified by a unique sequence of eight characters, consisting of a four character alphabetical code which usually identifies the department or subject area, and a four character numeric code which identifies the particular unit of study. Units of study can be grouped by subject and level. (See also *Core unit of study. Course, Major.)*

Unit of study enrolment status

The enrolment status indicates whether the student is still actively attending the unit of study (ie, currently enrolled) or is no longer enrolled (withdrawn or discontinued).

Unit of study group

A grouping of units of study within a course. The units of study which make up the groups are defined within FlexSIS.

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, University in this document refers to the University of Sydney.

University Medal

A faculty may recommend the award of a University Medal to students qualified for the award of an undergraduate Honours degree or some master's degrees, whose academic performance is judged outstanding.

UPA

University Postgraduate Award.

USYDnet

USYDnet is the University of Sydney's intranet system. In addition to the customised MyUni service, it provides access to other services such as directories (maps, staff and student, organisations), a calendar of events (to which staff and students can submit entries), and a software download area. (See also *MyUni.)*

Variation of enrolment

See Enrolment variation.

Vice-Chancellor

The chief executive officer of the University, responsible for its leadership and management. The Vice-Chancellor is head of both academic and administrative divisions.

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.)*

Weighted average mark (WAM)

The Weighted Average Mark (WAM) is the average mark in the unit of study completed, weighted according to credit point value and level. The formulae used to calculate the WAMs are course-specific: there are many different WAMs in the University.

Year of first enrolment (YFE)

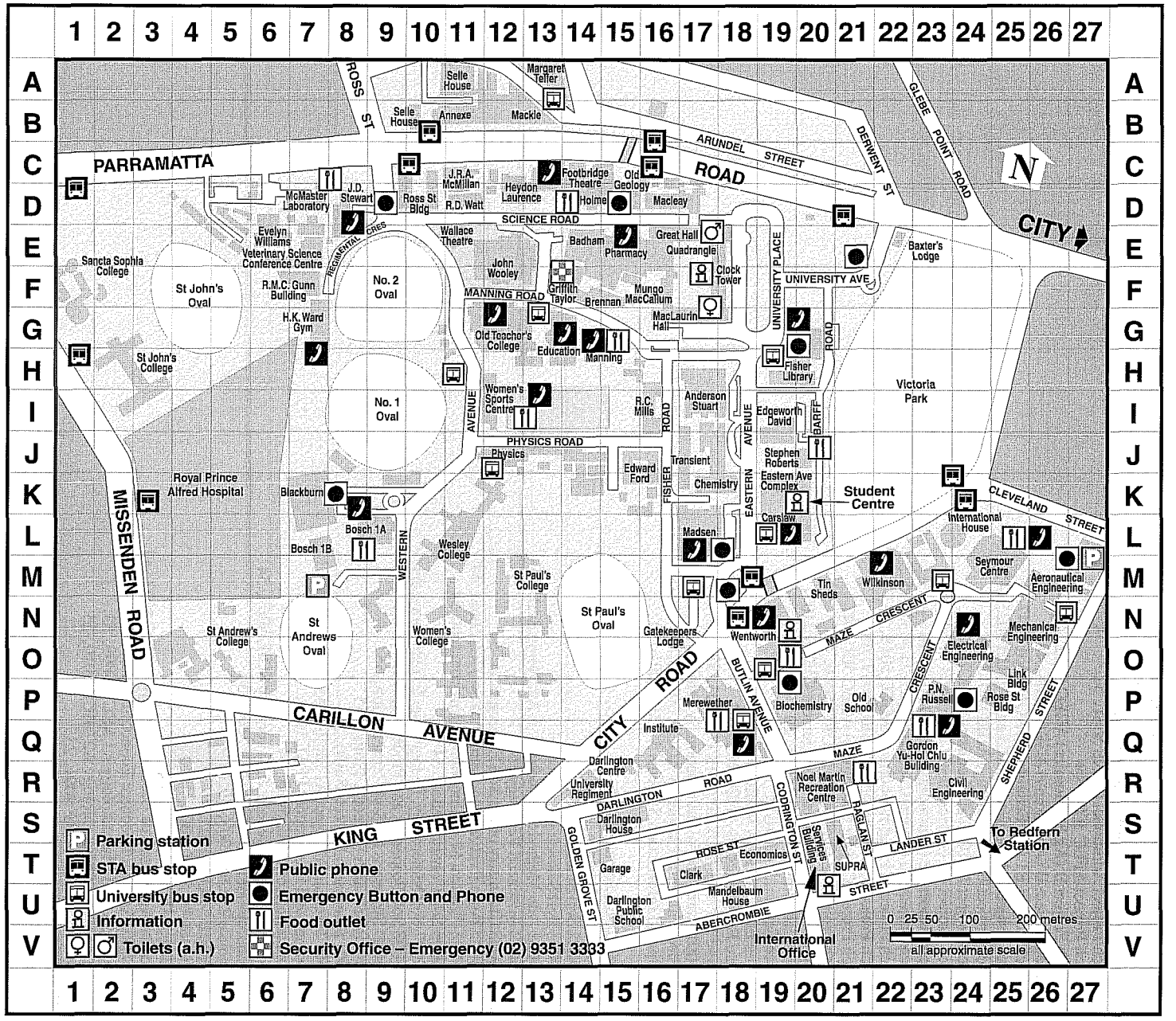
The year in which a student first enrols at the University.

Youth Allowance

Youfli Allowance is payable to a full-time student or trainee aged 16-24 years of age; and enrolled at an approved institution such as a school, college, TAFE or university, and undertaking at least 15 hours a week face-to-face contact. Youth Allowance replaces AUSTUDY.

Index

Map of main campus



Chancellor's Committee Shop **17F**
Chaplains'Centre **10G**
Chemical Engineering **23Q**
Chemistry **17K**
Child Care:
  Boundary Lane 16U
  Carillon Avenue **9Q**
  Laurel Tree House (Glebe) **16B**
  Union (Darlington) 21S
Civil Engineering **24R**
Clark Bldg **17T**
Clinical Nursing **Mallett St**
Clinical Ophthalmology & Eye Health **Sydney Eye Hospital**
Clock Tower **17F**
Clinical Trials **Mallett St**
Communication Disorders **Cumberland**
Community & Mental Health Nursing **Cumberland**
Community Health **Cumberland**
Community Medicine **1SK**
Computer Sales:
  Computer Sales and Service **23U**
  Computer Shop **21R**
Computer Science, Basser Dept **17L**
Continuing Education, Centre for **13B**
Coppleson Postgraduate Medical Institute **9K**
Copy Centre **21R**
Counselling Service **13G**
Crop Sciences **13F**
Darlington Centre **15R**
Darlington House 14S
Dentistry Faculty Office & Dental Studies **Surry Hills**
Development Office **16E**
Disability Services **13G**
Eastern Avenue Auditorium & Lecture Theatres **19K**
Econometrics **17P**
Economic History **17P**
Economics Bldg **19T**
Economics, Dept and Faculty Office **17P**
Edgeworth David Bldg **19J**
Education Bldg and Faculty Office **13G**
Educational Development & Evaluation **15K**
Educational Psychology, Literacies & Learning **13G**
Edward Ford Bldg **15K**
Electrical Engineering **240**
Employment Service, Casual **14C**
Engineering Faculty Office **250**
English **12E**
Equal Employment Opportunity Unit **13A**
Evelyn Williams Bldg **6E**
Experimental Medicine **7K**
External Relations Division **16E**
Facilities Planning, Office of **20T**
Family and Community Health in Nursing **Mallett St**
Financial institutions:
  Commonwealth Bank **14D**
  Credit Union-ATM only **14D**
  National Australia Bank 1SE, **19N**
Finance, Dept of **16Q**
Financial Management & Reporting **13A**
Financial Services Division **13A**
Financial Systems Development **13A**
Fine Arts (Art History & Theory) **161**
Fisher Library 19G
Footbridge Theatre **14C**
French Studies **15F**
Garage, University **15T**
Gender Studies **16E**
General Practice **Westmead Hospital**
Geography **16Q**
Geology and Geophysics **19J**
Germanic Studies **1SF**
Government and Public Administration **17P**
Great Hall **18E**
Greek, Modern **14F**
Griffith Taylor Bldg **14F**
Gunn, R.M.C. Bldg **7F**
Heydon Laurence Bldg **12D**
Health Information Management **Cumberland**
Health Sciences Faculty Office **Cumberland**
Health Service (Holme Bldg, Wentworth Bldg) **14D, 19N**
History **15F**
History and Philosophy of Science **19L**
Holme Bldg **14D**
Industrial Relations, Dept of **16Q**
Infectious Diseases 7K
Information Technology Services 19U
Institute Bldg **16Q**
International Office and International Student Services **20T**
International House **23L**
International Preparation Program **20T**
Italian **161**
Jurisprudence St **James**
Koori Centre **12G**
Law Dept and Faculty Offce St **James**
Learning Assistance Centre **13G**
Life Sciences in Nursing **Mallett St**
Linguistics **17J**
Link Bldg **250**
Lost Property **14F**
Mackie Bldg **13B**
MacLaurin Hall **16G**
Macleay Bldg and Museum **16D**
Madsen Bldg **17L**
Mail Room (Internal) **20T**
Main Bldg **17F**
Management Studies **Burren Street**
Mandelbaum House **18U**
Manning House **14H**
Margaret Telfer Bldg **13A**
Marketing, Dept of **16Q**
Mathematics and Statistics **19L**
McMasterBldg **7D**
McMillan, J.R.A., Bldg **11C**
Mechanical and Aeronautical Engineering Bldg **2SN**
Media and Publications **16E**
Mechanical Engineering **25N**
Media Office **16E**
Medical Radiation Technology **Cumberland**
Medicine, Dept of **7K**
Medicine, Faculty of **1SK**
Merewether Bldg **17P**
Microbiology **20P**
Mills, R.C. Bldg **161**
Mungo MacCallum Bldg **16F**
Music, Dept of **24M**
Nicholson Museum **16G**
Nursing Therapeutics **Cumberland**
Obstetrics and Gynaecology **9K**
Occupational Therapy **Cumberland**
Old Geology Bldg **15D**
Old School Bldg **21P**
Old Teachers'College Bldg **12G**
Operations Accounting **13A**
Orange-Rural Management, Faculty **Orange**
Orthoptics Cumberland
Paediatrics and Child Health **New Children's Hospital**
Pathology **7K**
Personnel Services **13A**
Pharmacology **7L**
Pharmacy **15E**
Philosophy **17G**
Photowise Imaging **20T**
Physics **13J**
Physiology **171**
Physiotherapy **Cumberland**
Planning Support Office **16E**
Post Office **15E**
Printing Services, University **20T**
Professional Studies **13G**
Properties and Investments **13A**
Prospective Students Unit **12B**
Psychological Medicine **4K**
Psychology **14E**
Purchasing **13A**
Publications Unit **16E**
Public Health and Community Medicine **15K**
Quadrangle **17F**
Queen Elizabeth U Research Institute **9K**
Regiment, University **14R**
Religion, School of Studies in **12E**
Research and Scholarships **16E**
Revenue Services **13A**
Risk Management **13A**
Rose Street Bldg **24P**
Ross Street Bldg **10D**
Russell, Peter Nicol, Bldg **23P**
St Andrew's College **50**
St John's College **3H**
St Paul's College **12N**
Sancta Sophia College IF