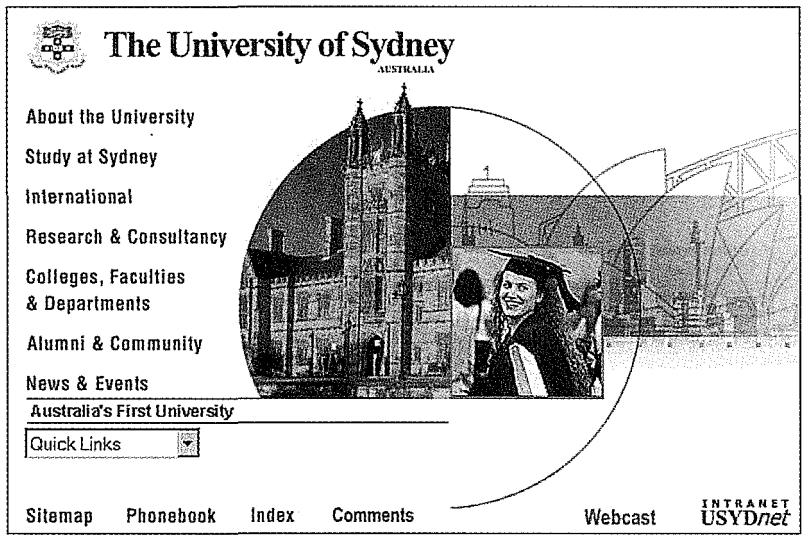
The University of Sydney

Faculty of Agriculture Handbook 2000



The University's homepage tells you all about courses at Sydney, some careers they can lead to, and what university life is like. The interactive website, with video and sound clips, has links to the University's faculties and departments.

You can explore the University of Sydney on the web at http://www.usyd.edu.au/.

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University semester and vacation dates 2000

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

	Day	Date (2000)
First Semester lectures begin	Monday	28 February
Easter recess		
Last day of lectures	Thursday	20 April
Lectures resume	Monday	1 May
Study vacation: 1 week beginning	Monday	5 June
Examinations commence	Monday	12 June
First Semester ends	Saturday	24 June
Second Semester lectures begin	Monday	10 July
Mid-semester recess		
Last day of lectures	Friday	8 September
Lectures resume	Monday	9 October
Study vacation: 1 week beginning	Monday	6 November
Examinations commence	Monday	13 November
Second Semester ends	Saturday	2 December

Last dates for withdrawal or discontinuation 2000

	Day	Date
Semester 1 units of study		
Last day to add a unit	Friday	10 March
Last day for withdrawal	Friday	31 March
Last day to discontinue with permission	Friday	14 April
Last day to discontinue	Friday	2 June
Semester 2 units of study		
Last day to add a unit	Friday	28 July
Last day for withdrawal	Thursday	31 August
Last day to discontinue with permission	Not applicable in 2000 *(there are 7 weeks to withdraw until 31 August)*	
Last day to discontinue	Friday	3 November
Full Year units of study		
Last day for withdrawal	Friday	31 March
Last day to discontinue with permission	Friday	14 July
Last day to discontinue	Friday	3 November

The University of Sydney Faculty of Agriculture Handbook 2000

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Contents

Welcome from the Dean

The management of our natural resources so as to ensure the sustainable production of food and fibre is vital to the future of the planet. Highly trained and dedicated graduates are crucial to the task of conserving and protecting these resources while meeting the needs of a global community expected to double by the year 2050.

The Faculty has responded to the breadth of these challenges by establishing two additional degrees commencing in 2000. The Bachelor of Land and Water Science and the Bachelor of Resource Economics degrees represent an exciting new development for the beginning of the 21st Century.

Australian agriculture is highly efficient and environmentally aware. It is an industry based on a renewable energy source, solar radiation, and is supported by an excellent research and technological infrastructure. Our graduates have outstanding employment rates, together with diverse career opportunities in the rural and related industries and in the management and conservation of our natural resources. There remain many challenges and problems which will require attention in the decade ahead.

The conservation of our soils depends on research by soil physicists, agronomists and effective information transfer systems. All these are areas in which graduates in agricultural science can play vital roles. The activities of the Student Landcare Group complement formal coursework in the development of students' understanding of the complexity of sustainable land management.

Molecular genetics offers great potential for facilitating the incorporation of desirable genes into new plant cultivars. For example, transgenic plants which have genes for resistance to disease and insect pests represent a new form of biological control. The University of Sydney is involved in training research scientists who are skilled in various techniques of plant breeding, including genetic engineering, tissue culture and traditional breeding methods. Furthermore, there is significant scope for the application of molecular biology in the improvement and conservation of our genetic stocks of animals, and in the development of vaccines.

There is considerable concern about the impact of pesticides on the environment and the presence of residues in food. Consequently, there are significant career opportunities in research and consulting into practices designed to reduce pesticide use. Courses concerned with environmental chemistry prepare graduates for work in these areas. The development of efficient processes for adding value to our primary products for export offers a major challenge to graduates in agricultural chemistry.

Graduates in horticultural science work predominantly in the private sector in a wide variety of production and processing businesses, and in marketing and consulting roles to improve production, packaging, processing and the quality of fresh foods. Graduates who specialise in amenity horticulture play an important role in the management of plants and plant ecosystems within the urban environment.

The sound management of agriculture requires more than good science. Economic research is needed to assess the social costs and benefits of alternative agricultural practices and to establish appropriate policies for using our natural resources. There are exciting challenges ahead for graduates interested in agricultural marketing and exports with new opportunities in Asia and the gradual breakdown of trade barriers.

Competition for water and land is becoming acute, both in Australia and overseas. The development of sensible government policies concerning land and water use, and the conservation of biodiversity depends on rigorous socio-economic research. Our graduates excel in such areas.

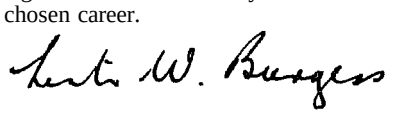
Excursions provide opportunities for students to visit the major agroclimatic regions of New South Wales, the Northern Territory, Queensland and Southeast Asia. The Faculty has a well established Undergraduate Achievers' Program. Students have the opportunity to compete for places in the International Student Exchange Program. Our undergraduates in this program have recently studied for a year at the University of California, Davis and Berkeley, the University of Illinois, and Guelph University, Canada. Such experiences are highly valued by employers.

The Faculty of Agriculture has an outstanding international reputation for its teaching and research. It has extensive resources on the Sydney campus and at Camden where facilities are located for poultry and large animal research and for horticultural and agronomic research. In addition, a Plant Breeding Institute at Camden provides teaching in advanced plant biotechnology. Postgraduate teaching and research is also undertaken at the LA. Watson Grains Research Centre, Narrabri. The Faculty is also involved in international development activities and at present has major teaching and research projects in Vietnam.

The Faculty is the largest Faculty of Agriculture in Australia, but is relatively small by University of Sydney standards. Students have greater access to staff than in larger faculties and the student body is an active and socially cohesive group. These features promote a warm and friendly atmosphere which is conducive to intellectual and social development. Students are encouraged to take advantage of the wide range of extracurricular activities available on campus.

This handbook provides general information about the Faculty and more specific details concerning units of study available in each of the degree programs. Further information and advice can be obtained from Faculty advisers.

It is with great pleasure that I welcome you to the Faculty of Agriculture and extend my best wishes to each of you in your chosen career.



Lester W. Burgess, Dean.

CHAPTER 1

Guide to the Faculty

Faculty Office

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Department staff

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John Triantafillis, BScAgr, PhD
Brett Whelan, BScAgr PhD
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Harold R Geering, MS *Cornell*
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Agricultural Economics

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Research Fellow
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Senior Lecturer
David L. Evans, BVSc PhD
Rosanne M. Taylor, BVSc PhD
Lecturers
Melanie Collier, BSc PhD *Leeds*
Michelle L. Hyde, BScAgr PhD
Paul McGreevy, BVSc PhD *Brist.*
Senior Technical Officers
Kim Heasman
Irene van Ekris, BSc *J.C.U.*
Angelika Trube
Technical Officers
Dung T. Doan
Helen Hughes
Kerry Murdoch
Andrew Souter

Administrative Assistant
Margaret Byrne

Camden

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Lai Wang, BSc *Nankai* PhD

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Mohammad Reza Shariflou, BAgSc MAnSc *Tehran* PhD
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Narrabri
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Frank W.H. Ellison, MScAgr PhD
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Daryl J. Mares, BSc PhD *Melb.*
Research Fellow
Kolumbina Mrva, BSc *Magr Zagreb,* PhD
Postdoctoral Fellows
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Shakir Shah, BSc *Rawalpindi* MSc *Faisalabad* PhD *Calif.*
Professional Officer Grade 111
Stephen G. Moore, BSc *N.E.*

CHAPTER 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: 2 u Mathematics (not Maths in Society)

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, Asian studies, commercial law, econometrics, economics, finance, geography, government, marketing, 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: Examples include applied economists with: commodity and futures brokers, merchant banks and trading banks; Department of Primary Industries and Energy, Departments of Agriculture, ABARE, AMLC, Australian Wheat Board and the Industry Commission, the FAO; economic researchers with 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 Land and Water Science

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

Assumed knowledge: 2u Mathematics (not Maths in Society) *and either* (2u Chemistry and 2u Physics) *or* 3u Science or 4u Science.

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: 2 u Mathematics (not Maths in Society)) *and either* (2 u Chemistry and 2 u Physics) *or* 3 u Science or 4 u Science.

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: 3u Mathematics and either 2u Chemistry or 2u Physics or 3u Science.

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 & 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: 2 u Mathematics (not Maths in Society) *and either* (2 u Chemistry and 2 u Physics) *or* 3 u Science or 4 u Science.

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 management, agronomy, animal science and production, biometry, cereal chemistry, horticultural science, plant pathology, resource economics, soil science. Special program combinations of courses in fourth year taken from agricultural economics include: natural resource economics, applied commodity trade and applied marketing. Other special 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' under 'Exclusion' in Section 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 Science in Agriculture

Unit of study		Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered

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 resolutions (See Section 8). The degree requires a minimum time of four years. The units prescribed are summarised below.

■ First Year (Commenced in 1995, revised in 1997)

ENTO 1001	Agricultural Entomology 1	4		*July*
CROP 1001	Agricultural Science 1A	6	A) HSC 2 unit Chemistry or 3 unit Science. N)HORT1001 Horticultural Science 1A.	*February*
CROP 1002	Agricultural Science 1B	6	C) CROP1001. N)HORT1002 Horticultural Science 1B.	*July*
BIOL 1201	Biology - Agricultural Concepts	4	A) HSC 2 unit Biology.	*February*
BIOL 1202	Biology - Agricultural Systems	5	A) BIOL 1201 or HSC 2 unitBiology.	*July*
BIOM 1001	Biometry 1	5	A) HSC 2 unit Mathematics.	*February*
AGEC 1003	Economic Environment of Australian Agriculture 1A	3	A) HSC 2 unit Mathematics.	*February*
AGEC 1004	Economic Environment of Australian Agriculture 1B	3	A) HSC 2 unit Mathematics. C) AGEC1003.	*July*
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.	*February*
CHEM 1002	Fundamentals of Chemistry 1B	6	P) CHEM 1001 or equivalent. N) May not be counted with CHEM 1102 or 1902 or 1904.	*July*
or				
CHEM 1901	Chemistry 1A (Advanced)	6	P) UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred - MATH 1001 and 1002 or 1901 and 1902; otherwise - MATH 1011 and 1012. N) May not be counted with CHEM 1001 or 1101 or 1903.	*February*
CHEM 1902	Chemistry 1B (Advanced)	6	Q) CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred- MATH 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904, otherwise - MATH 1013 and1 1015 or 1004 and 1005. N) May not be counted with CHEM 1002 or 1102 or 1904.	*July*

■ Second Year

AGCH 2002	Agricultural Chemistry 2	8	P) CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry.	*February*
GENE 2001	Agricultural Genetics 2	6	P) BIOL1201 andBIOL1202orBIOL1001 and BIOL1002, BIOM1001.	*July*
MICR 2101	Agricultural Microbiology 2	6	P) First year Biology, First year Chemistry or Chemistry 1 Advanced.	*February*
ANSC 2002	Animal Science 2	6	P) CROP1001 and CROP1002 or HORT1001 and HORT1002. C) AGCH2002.	*July*
BIOM 2001	Biometry 2	6	P) BIOM1001.	*February*
CROP 2002	Crop Protection 2	4	P) CROP1001 and CROP1002, or HORT1001 and HORT1002, and BIOL1001 and BIOL1002 orl003, orBIOL1201 and 1202. C) MICR2101.	*July*
CROP 2001	Crop Science 2	6	P) CROP1001 and CROP 1002, or HORT1001 and HORT1002, and BIOM1001. C) AGCH2002.	*July*

Bachelor of Science in Agriculture – continued

Unit of study		Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
SOIL 2003	Soil Science 2	6	,	*February*
■ **Third Year (The normal load is 48 credit points)**				
AGEC 2001	Commodity Price Analysis 2	8	P) Agricultural Economics I or AGEC 1002 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004) or ECON1001.	*February*
AGEC 2003	Production Economics 2	8	P) Agricultural Economics 1 or AGEC 1001 or AGEC 1031 orECON2001 or Economics II or Economic Environment of Australian Agriculture or (AGEC1003 and AGEC1004).	*July*
AGEC 3001	Agribusiness Management 3	8	P) AGEC2003 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004).	*February*
AGEC 4004	Applied Marketing 4	8	P) AGEC2001 or (AGEC 1003 & AGEC 1004) or Economic Environment of Australian Agriculture or Economics II or ECON2001 or ECON2901.	*July*
AGCH 3004	Chemistry and Biochemistry of Ecosystems 3	8	P) AGCH2002.	*July*
AGCH 3005	Food Chemistry and Biochemistry (Agriculture) 3	8	P) AGCH2002.	*February*
AGCH 3012	Rural Environmental Chemistry	4	P) ENVI2003, 2004, 2103 and 2104 (From year 2001: ENVI 2001 and 2002). C)ENVI3001. *NB: This unit is normally offered only to students enrolled in the BSc (Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor.*	*February*
AGCH 3016	Agricultural Biotechnology 3	4	A) AGCH2002, GENE2001, MICR2101, ANSC2002 and CROP2001, or the equivalent of these units.	*July*
MICR 3102	Agricultural Microbiology 3	8	P) MICR2101.	*July*
CROP 3002([1])	Agricultural Systems and Irrigation Science 3	8	N) HORT2001 or CROP3003.	*July*
CROP 3003([1])	Agricultural Systems for Horticultural Science 3	4	N) CROP3002.	*July*
AGRO 3001	Agronomy 3	8	P) AGRO2002 or CROP 1001 or HORT 1001.	*February*
ANSC 3001	Animal Nutrition 3	8	P) ANSC2002.	*February*
ANSC 3002	Animal Reproduction 3	8	P) ANSC2002.	*July*
ANSC 3003	Animal Structure and Function 3A	8	P) ANSC2002.	*February*
ANSC 3004	Animal Structure and Function 3B	8	P) ANSC2002.	*July*
ANSC 3005	Animal Biotechnology 3	4	P) Students are expected to have knowledge of Genetics equivalent at least to Agricultural Genetics 2 (GENE2001) and knowledge of Animal Science equivalent to Animal Science 2 (ANSC2002). C) Agricultural Biotechnology (AGCH30I6).	*July*
BIOM 3002	Experimental Design 3	4	P) BIOM2001. N) BIOM300I.	*February*
BIOM 3003	Statistical Modelling 3	4	P) BIOM2001. N) BIOM3001.	*February*
HORT 3001	Horticultural Science 3	8	P) CROP2001 orHORT2001 or AGRO2002.	*February*
HORT 3002	Flower & Nursery Crops 3	4	P) CROP 2001 or HORT 2001 or AGRO 2002.	*July*
HORT 3003	Postharvest Biology and Technology 3	4	P) CROP 2001 or HORT 2001 or AGRO 2002.	*July*

Bachelor of Science in Agriculture - continued

Unit of study		Credit points:	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
PPAT 3002	Plant Disease 3	4	P) CROP2001,CROP2002,GENE2001.	*July*
RSIS 3001	Rural Spatial Information Systems 3	4	P) SOIL 2003, BIOM2001 or BIOM2002.	*February*
SOIL 3003	Soil Science 3	8	P) SOIL2003.	*July*

(1) mutually exclusive

■ Fourth Year (48 credit points)

AGEC 4022	Agribusiness 4A .	24	P) AGEC3001, 24 credit points of 3rd year Agr Sc. C) AGEC4023.	*February*
AGEC 4023	Agribusiness 4B	24	P) AGEC3001, 24 credit points of 3rd year Agr Sc. C) AGEC4022.	*July*
AGCH 4002	Agricultural Chemistry 4A	24	P) AGCH3004 or AGCH3005.	*February*
AGCH 4003	Agricultural Chemistry 4B	24	C) AGCH4002.	*July*
AGEC 4020	Agricultural Economics 4A	24	P) AGEC2001.AGEC2003. C) AGEC4021 Agricultural Economics 4B.	*February*
AGEC 4021	Agricultural Economics 4B	24	P) AGEC2001, AGEC2003. C) AGEC4020.	*July*
ENTO 4001	Agricultural Entomology 4A	24	P) ENTO 1001 or Agricultural Science 1. C) ENTO4002.	*February*
ENTO 4002	Agricultural Entomology 4B	24	P) ENTO 1001 or Agricultural Science 1. C) ENTO4001.	*July*
GENE 4001	Agricultural Genetics 4A	24	P) BIOM2001.GENE2001.	*February*
GENE 4002	Agricultural Genetics 4B	24	P) BIOM2001.GENE2001. C) GENE4001.	*July*
MICR 4101	Agricultural Microbiology 4A	24	P) MICR3102. C) MICR4102.	*February*
MICR 4102	Agricultural Microbiology 4B	24	P) MICR3102. C) MICR4101.	*July*
AGRO 4001	Agronomy 4A	24	P) AGRO3001.	*February*
AGRO 4002	Agronomy 4B	24	P) AGRO3001. C) AGRO4001.	*July*
ANSC 4001	Animal Production 4A	24	P) ANSC3001,ANSC3002,ANSC3003.	*February*
ANSC 4002	Animal Production 4B	24	P) ANSC3001, ANSC3002, ANSC3003. C) ANSC4001.	*July*
BIOM 4001	Biometry 4A	24	P) BIOM3001.	*February*
BIOM 4002	Biometry 4B	24	P) BIOM3001. C) BIOM4001.	*July*
AGCH 4004	Cereal Science 4A	24	P) AGCH3005.	*February*
AGCH 4005	Cereal Science 4B	24	C) AGCH4004.	*July*
FARM 4001	Farming Systems 4A	24	P) AGEC2003orAGEC3001. C) AGRO3001.	*February*

Bachelor of Science in Agriculture - continued

Unit of study		Credit points:	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
FARM 4002	Farming Systems 4B	24	P) AGEC2003 or AGEC3001. C) FARM4001,AGRO3001.	*July*
HORT 4001	Horticultural Science 4A	24	P) HORT3001.	*February*
HORT 4002	Horticultural Science 4B	24	P) HORT3001.	*July*
PPAT 4001	Plant Pathology 4A	24	P) Plant Pathology 3 or PPAT3001.	*February*
PPAT 4002	Plant Pathology 4B	24	P) Plant Pathology 3 or PPAT3001.	*July*
AGEC 4024	Resource Economics 4A	24	P) AGEC2001, AGEC2003 and 24 credit points of 3rd year Agr Sc. C) AGEC4025.	*February*
AGEC 4025	Resource Economics 4B	24	P) AGEC2001, AGEC2003 and 24 credit points of 3rd year Agr Sc. C) AGEC4024.	*July*
SOIL 4002	Soil Science 4A	24	P) SOIL 3003.	*February*
SOIL 4003	Soil Science 4B	24	C) SOIL4002.	*July*
AGRF 4001	Special Program 4A	24		*February*
AGRF 4002	Special Program 4B	24		*July*

Bachelor of Horticultural Science

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered

The degree of Bachelor of Horticultural Science is available for those wishing to specialise in the field of horticultural science. Regulations governing candidature for the BHortSc degree are set out in Resolutions (See Section 8). The degree requires a minimum time of four years. The courses prescribed are summarised below.

■ First Year (Commenced in 1995, revised in 1997)

ENTO 1001	Agricultural Entomology 1	4		*July*
HORT 1001	Horticultural Science 1A	6	A) HSC 2 unit Chemistry or 3 unit Science. N)CROP1001.	*February*
HORT 1002	Horticultural Science 1B	6	C) HORT 1001. N) CROP 1002.	*July*
BIOL 1201	Biology - Agricultural Concepts	4	A) HSC 2 unit Biology.	*February*
BIOL 1202	Biology - Agricultural Systems	5	A) BIOL 1201 or HSC 2 unitBiology.	*July*
BIOM 1001	Biometry 1	5	A) HSC 2 unit Mathematics.	*February*
AGEC 1003	Economic Environment of Australian Agriculture 1A	3	A) HSC 2 unit Mathematics.	*February*
AGEC 1004	Economic Environment of Australian Agriculture 1B	3	A) HSC 2 unit Mathematics. C) AGEC 1003.	*July*
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.	*February*
CHEM 1002	Fundamentals of Chemistry 1B	6	P) CHEM 1001 or equivalent. N) May not be counted with CHEM 1102 or 1902 or 1904.	*July*
or				
CHEM 1901	Chemistry 1A (Advanced)	6	P) UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred - MATH 1001 and 1002 or 1901 and 1902; otherwise - MATH 1011 and 1012. N) May not be counted with CHEM 1001 or 1101 or 1903.	*February*
CHEM 1902	Chemistry 1B (Advanced)	6	Q) CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred - MATH 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904, otherwise - MATH 1013 andI 1015 or 1004 and 1005. N) May not be counted with CHEM 1002 or 1102 or 1904.	*July*

■ Second Year

AGCH 2002	Agricultural Chemistry 2	8	P) CHEM1001 and CHEM1002 or CHEM1901 and CHEM1902 or First Year Chemistry.	*February*
GENE 2001	Agricultural Genetics 2	6	P) BIOL1201 andBIOL1202orBIOL1001 and BIOL1002, BIOM1001.	*July*
MICR 2101	Agricultural Microbiology 2	6	P) First year Biology, First year Chemistry or Chemistry 1 Advanced.	*February*
HORT 2001	Horticultural Science 2	6	P) HORT1001 & HORT 1002 or CROP 1001 andCROP1002. C) CROP2001.	*July*
BIOM 2001	Biometry 2	6	P) BIOM 1001.	*February*
CROP 2002	Crop Protection 2	4	P) CROP1001 and CROP1002, or HORT 1001 and HORT1002, and BIOL1001 and BIOL1002 orl003, orBIOL1201 and 1202. C) MICR2101.	*July*
CROP 2001	Crop Science 2	6	P) CROP1001 andCROP1002, orHORTlOOl and HORT1002, andBIOMlOOl. C) AGCH2002.	*July*

Bachelor of Horticultural Science - continued

Unit of study		Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
SOIL 2003	Soil Science 2	6		*February*
■ Third Year (The normal load is 48 credit points)				
AGEC 3001	Agribusiness Management 3	8	P) AGEC2003 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004).	*February*
AGCH 3005	Food Chemistry and Biochemistry (Agriculture) 3	8	P) AGCH2002.	*February*
CROP 3002	Agricultural Systems and Irrigation Science 3	8	N) HORT2001 or CROP3003.	*July*
AGRO 3001	Agronomy 3	8	P) AGRO2002 or CROP 1001 or HORT 1001.	*February*
AGEC 4004	Applied Marketing 4	8	P) AGEC2001 or (AGEC 1003 & AGEC 1004) or Economic Environment of Australian Agriculture or Economics II or ECON2001 or ECON2901.	*July*
BIOM 3002	Experimental Design 3	4	P) BIOM2001. N)BIOM3001.	*February*
BIOM 3003	Statistical Modelling 3	4	P) BIOM2001. N)BIOM3001.	*February*
AGEC 2001	Commodity Price Analysis 2	8	P) Agricultural Economics I or AGEC 1002 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004) or ECON1001.	*February*
AGCH 3004	Chemistry and Biochemistry of Ecosystems 3	8	P) AGCH2002.	*July*
AGCH 3012	Rural Environmental Chemistry	4	P) ENVI 2003, 2004, 2103 and 2104 (From year 2001: ENVI 2001 and 2002). C)ENVI3001. *NB: This unit is normally offered only to students enrolled in the BSc(Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor.*	*February*
AGCH 3016	Agricultural Biotechnology 3	4	A) AGCH2002, GENE2001, MICR2101, ANSC2002 and CROP2001, or the equivalent of these units.	*July*
HORT 3001	Horticultural Science 3	8	P) CROP2001 orHORT2001 or AGRO2002.	*February*
HORT 3002	Flower & Nursery Crops 3	4	P) CROP 2001 or HORT 2001 or AGRO 2002.	*July*
HORT 3003	Postharvest Biology and Technology 3	4	P) CROP 2001 or HORT 2001 or AGRO 2002.	*July*
PPAT 3002	Plant Disease 3	4	P) CROP2001,CROP2002, GENE2001.	*July*
AGEC 2003	Production Economics 2	8	P) Agricultural Economics 1 or AGEC1001 or AGEC1031 orECON2001 or Economics II or Economic Environment of Australian Agriculture or (AGEC1003 andAGEC1004).	*July*
SOIL 3003	Soil Science 3	8	P) SOIL2003.	*July*
■ Fourth Year				
HORT 4001	Horticultural Science 4A	24	P) HORT3001.	*February*
HORT 4002	Horticultural Science 4B	24	P) HORT3001.	*July*

Bachelor of Land and Water Science

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered

Regulations governing candidature for the BLWSc degree are set out in the Resolutions (see Section 8). The degree requires a minimum of four years. The units prescribed are summarised below.

■ First Year (Commenced in 2000)

BIOM 1002	Environmetrics 1	6	A) 2 unit Mathematics.	*July*
BIOL 1001	Concepts in Biology	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1901.	*February*
ENVI 1001	Global Geology	6		*February*
ENVI 1002	Geomorphic Environments and Change	6		*July*
LWSC 1001	Land and Water Science 1A	6		*February*
LWSC 1002	Land and Water Science 1B	6	C) (LWSC1001) Land and Water Science IA.	*July*
and 12 credit points from First year Chemistry				
CHEM 1001	Fundamentals of Chemistry I A	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 orl903.	*February*
CHEM 1002	Fundamentals of Chemistry 1 B	6	P) CHEM 1001 or equivalent. N) May not be counted with CHEM 1102 or 1902 or 1904.	*July*
or from standard level CHEM 1101 Chemistry 1A and 1102 Chemistry 1B or from advanced level CHEM 1901 Chem IA (Adv) and CHEM 1902 Chem 1B (Adv)				

■ Second Year

BIOM 2002	Environmetrics 2	4	P) BIOM1002.	*February*
AGCH 2002	Agricultural Chemistry 2	8	P) CHEM1001 and CHEM1002 or CHEM1901 and CHEM1902 or First Year Chemistry.	*February*
BIOL 2004	Plant Ecology and Diversity	8	Q) BIOL 1001 or 1901 and one of BIOL 1002, 1902, 1003, 1903. N) May not be counted with BIOL 2904. *NB: 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.*	*February*
BIOL 2101	Animals A - Theory	4	Q) BIOL 1001 or 1901 and one of BIOL 1002, 1902, 1003, 1903. N) May not be counted with BIOL 2001 or 2901. *NB: The content of BIOL 1002/1902 is assumed knowledge and students entering from BIOL 1003 or 1903 will need to do some preparatory reading. Not a prerequisite for Senior units of study in Biology. Students taking this unit concurrently with (orfollowing completion of) BIOL 2004 or 2904 or 2006 or 2906 must complete 16 hours of alternative work in one unit, in place of the core material common to both units. Students taking BIOL 2101 concurrently with (or following completion of) BIOL 2106 must complete 16 hours of alternative work in place of the core material common to both units, and if taking these units.concurrently, must elect at enrolment in which unit they wish to do the alternative work.*	*February*
BIOL 2102	Animals B - Theory	4	Q) BIOL 1001 or 1901 and one of BIOL 1002, 1902, 1003, 1903. N) May not be counted with BIOL 2002 or 2902. *NB: The content of BIOL 1002/1902 is assumed knowledge and students entering from BIOL 1003 or 1903 will need to do some preparatory reading. Not a prerequisite for Senior units of study in Biology. Students taking this unit concurrently with (or following completion of) BIOL 2003 or 2903 or 2002 or 2905 must complete 16 hours of alternative work in one unit, in place of the core material. Students taking BIOL 2102 concurretnlty with (or following completion of) BIOL 2105 must complete 16 hours of alternative work as part of BIOL 2102 in place of core material common to both units.*	*July*

Bachelor of Land and Water Science - continued

Unit of study		Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
GEOG 2302	Fluvial Geomorphology and Hydrology		*NB: Not offered in 2000.*	
LWSC 2001	Land and Water Science 2A	2	*NB: Not offered in 2000.*	*February*
LWSC 2002	Land and Water Science 2B	2	*NB: Not offered in 2000.*	*July*
MICR 2003	Theoretical Microbiology A	4	Q) BIOL 1002 or 1902 or 1003 or 1903. P) CHEM 1102 or 1902 or 1904. C) BIOL 1001 or 1901 and CHEM 1101 or 1901 or 1903 and MATH (1001 or 1011 or 1901) and (1005 or 1015 or 1905). N) May not be counted with MICR 2001 or 2901.	*February*
SOIL 2003	Soil Science 2	6		*February*

■ Third Year (48 credit points)

AGCH 3012	Rural Environmental Chemistry	4	P) ENVI 2003, 2004, 2103 and 2104 (From year 2001: ENVI 2001 and 2002). C) ENVI 3001. *NB: This unit is normally offered only to students enrolled in the BSc(Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor.*	*February*
AGCH 3014	Chemistry and Biochemistry of Ecosystems 3LWS	4	P) AGCH2002.	*July*
AGRO 3001	Agronomy 3	8	P) AGRO2002 or CROP 1001 orHORT1001.	*February*
ENVI 3004	Environmental Assessment	4	*NB: Not offered in 2000.*	*July*
LWSC 3001	Hydrology and Catchment Management	4	*NB: Not offered in 2000.*	*July*
RSIS 3001	Rural Spatial Information Systems 3	4	P) SOIL 2003, BIOM2001 orBIOM2002.	*February*
SOIL 3003	Soil Science 3	8	P) SOIL2003.	*July*

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.

■ Fourth Year (48 credit points)

AGEC 4027	Introductory Land and Water Economics	4	*NB: Not offered in 2000.*	*February*
ENVI 3003	Environmental Law and Planning	4	*NB: Not offered in 2000.*	*February*
LWSC 4001	Planning and Communicating Policy	4	*NB: Not offered in 2000.*	*February*
LWSC 4002	Project/Case Study	24	*NB: Not offered in 2000.*	*July*

And 12 credit points of electives chosen with the approval of the course coordinator from ec<^logy, land science, water science, biophysical modelling, socioeconomics or political systems.

Bachelor of Agricultural Economics

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered

The degree of Bachelor of Agricultural Economics is available for those wishing to specialise in the field of agricultural economics. Regulations governing candidature for the BAgrEc degree are set out in the Resolutions (See Section 8). The degree requires a minimum time of four years. The courses prescribed are summarised below.

■ First Year

AGEC 1001	Agricultural Economics 1A	6	A) HSC 2 unit Mathematics.	*February*
AGEC 1002	Agricultural Economics 1B	6	A) HSC 2 unit Mathematics. C) AGEC 1001.	*July*
ECMT 1010	Econometrics 1A	6	A) Minimum HSC 2 unit Maths.	*February, July*
ECMT 1020	Econometrics 1B	6	C) ECMT1010. *NB: Other than in exceptional circumstances, it is strongly recommended that students do not undertake 1B before attempting IA.*	*July*
ECON 1001	Introductory Microeconomics	6	A) HSC 2 unit Mathematics.	*February*
ECON 1002	Introductory Macroeconomics	6	A) HSC 2 unit Mathematics.	*July*

and 12 credit points from Table 1

■ Second Year

AGEC 2001	Commodity Price Analysis 2	8	P) Agricultural Economics I or AGEC 1002 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004) or ECON 1001.	*February*
ECON 2001	Intermediate Microeconomics	8	P) ECON 1001. Students who have completed first year units in the Political Economy program may transfer to ECON2001 upon passing an examination arranged by the department. C) ECMT1010. *NB: Certain combinations ofMaths/Stats may substitute for Econometrics - consult Faculty.*	*February*
ECON 2002	Intermediate Macroeconomics	8	P) ECON1002. Students who have completed first year units in the Political Economy program may transfer to ECON2002 upon passing an examination arranged by the department. C) ECMT1020. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Faculty.*	*July*
AGEC 2003	Production Economics 2	8	P) Agricultural Economics 1 orAGEC1001 orAGEC1031 orECON2001 or Economics II or Economic Environment of Australian Agriculture or (AGEC1003 and AGEC1004).	*July*
AGEC 2005	Applied Commodity Modelling 2	4	P) Econometrics I or (ECMT1010 and ECMT1020) or (MATH 1001 and 1002 and 1003 and 1005) Econometrics I or (ECMT1010 and ECMT 1020) or (MATH 1001 and 1002 and 1003 and 1005). N) AGEC2006 and AGEC2007.	*February*

or AGEC 2006 and AGEC 2007

and a minimum of 12 credit points from Table 1 and/or Table 2

■ Third Year

AGEC 3001	Agribusiness Management 3	8	P) AGEC2003 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004).	*February*
AGEC 3002	Agricultural and Resource Policy 3	8	P) (AGEC2001 & AGEC2003) orECON2001 orECON2901 or Economics II.	*July*
AGEC 3004	Research Methods 3	4	P) AGEC2003 and AGEC2002 or AGEC2005 or (AGEC2006 and AGEC2007) or ECMT2020.	*February*
Two units of level 3 ECON		8+8	P) ECON2001,ECON2002.	

Bachelor of Agricultural Economics - continued

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
and a minimum of 12 credit points from Table 2			
■ Fourth Year			
AGEC 4001 Research Project 4	16	C) Any 24 credit points from Level 4000 AGEC units.	*Full Year (starts Feb)*
AGEC 4010 Contemporary Issues 4A	4	C) AGEC4011 and at least 12 other level 4 AGEC credit points.	*February*
AGEC 4011 Contemporary Issues 4B	4	C) AGEC4010 and at least 12 other level 4 AGEC credit points.	*July*
and at least 24 credit points from			
AGEC 4003 Applied International Trade 4	8	P) AGEC2001 or Economics II or (ECON2001 and ECON2002) or (ECON2901 and ECON2902).	*February*
AGEC 4004 Applied Marketing 4	8	P) AGEC200I or (AGEC 1003 & AGEC 1004) or Economic Environment of Australian Agriculture or Economics II or ECON2001 or ECON2901.	*July*
AGEC 4005 Natural Resource Economics 4	8	P) (AGEC2001 and AGEC2003) or Economics II or (ECON2001 and ECON2002).	*July*
AGEC 4008 Quantitative Planning Methods 4	4	P) AGEC2003. C) AGEC3001 or AGEC3031.	*February*
AGEC 4009 Agricultural Finance and Risk Management 4	4	P) AGEC 2003. C) AGEC3001 or AGEC3031.	*February*
AGEC 4007 Special Topics in Agricultural and Resource Economics 4	8		*February, July*
and 8 credit points from other coursework approved by the Head of the Department of Agricultural Economics.			

Optional units of study in the BAgrEc degree

■ Table 1

ACCT **1001(1)** Accounting IA	6	A) 2 unit Maths. *NB: Restricted entry (code 511500 or 521500 or 511503 or 521503 ior Combined Commerce).*	*February, July*
ACCT 1002(2) Accounting 1B	6	P) ACCT1001. *NB: Restricted entry (code 511500 or 521500 or 511503 or 521503 cor Combined Commerce).*	*February, July*
ACCT 1003([1]) Financial Accounting Concepts	6	N) Terminating unit. Cannot be counted with ACCT1001 and ACCT1002.	*February*
ACCT 1004([2]) Management Accounting Concepts	6	N) Terminating unit. Cannot be counted with ACCT1001 and ACCT1002.	*July*
BIOL 1001 Concepts in Biology	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1901.	*February*
BIOL 1002 Living Systems	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1902.	*July*
or			
BIOL 1003 Human Biology	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1903.	*July*
CROP 1001 Agricultural Science 1A	6	A) HSC 2 unit Chemistry or 3 unit Science. N)HORT1001 Horticultural Science IA.	*February*
CROP 1002 Agricultural Science 1B	6	C) CROP1001. N) HORT1002 Horticultural Science 1B.	*July*
CLAW 1001 Commercial Transactions A	6		*February, July*
CLAW 1002 Commercial Transactions B	6	P) CLAW 1001.	*July*

Bachelor of Agricultural Economics - continued

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
GEOG 1001 Biophysical Environments	6		*February*
GEOG 1002 Human Environments	6		*July*
First year Government (GOVT)			
MATH 1011 Life Sciences Calculus	3	A) HSC 2-unit Mathematics. N) May not be counted with MATH 1901 or 1001. May not be counted by students enrolled in the BSc/BCom combined award course.	*February*
MATH 1012 Life Sciences Algebra	3	A) HSC 2-unit 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.	*July*
MATH 1013 Life Sciences Difference and Differential Equations	3	A) HSC 2-unit Mathematics. N) May not be counted with MATH 1003 or 1903. May not be counted by students enrolled in the BSc/BCom combined award course.	*July*
MATH 1015 Life Sciences Statistics	3	A) HSC 2-unit Mathematics. N) May not be counted with MATH 1905 or 1005. May not be counted by students enrolled in the BSc/BCom combined award course.	*February*
Modern Language (level 1) units with the approval of the Dean of Agriculture.			

(1) ACCT1001 and ACCT1003 are mutually exclusive.
(2) ACCT1002 and ACCT1004 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, Mathematics (Life Sciences) and Modern Language. Students may not count both Accounting IA and 1B, and Financial Accounting Concepts and Management Accounting Concepts towards their degree.

■ Table 2

AGEC 4008	Quantitative Planning Methods 4	4	P) AGEC2003. C) AGEC3001 or AGEC3031.	*February*
AGEC 4009	Agricultural Finance and Risk Management 4	4	P) AGEC 2003. C) AGEC3001 or AGEC3031.	*February*
AGRO 3001	Agronomy 3	8	P) AGRO2002 or CROP1001orHORT1001.	*February*
AGRO 2002	Crop and Pasture Agronomy 2	6		*July*
ANSC 2003	Animal Science 2AE	4		*July*
ASNS 2601	Asian Studies IA (Japanese)	4		*February*
ASNS 2602	Asian Studies 1B (Japanese)	4	P) ASNS 2601.	*July*
ASNS 2603	Asian Studies 2A (Japanese)	4	P) ASNS2602.	*February*
ASNS 2604	Asian Studies 2B (Japanese)	4	P) ASNS2603.	*July*
ASNS 3601	Asian Studies 3A (Japanese)	4	P) ASNS 2604.	*February*
ASNS 3602	Asian Studies 3B (Japanese)	4	P) ASNS3601.	*July*
ECMT 2010	Regression Modelling	8	P) ECMT1010 and ECMT 1020.	*February*

ECMT 2020(3) **Code not found in ANY FACULTY**

Bachelor of Agricultural Economics -- continued

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
HORT 3001 Horticultural Science 3	8	P) CROP2001 or HORT2001 or AGRO2002.	*February*

Any level 2 semester units of study in:
Economic History (ECHS)
Government (GOVT)

Any level 2 or 3 semester units of study in:
Accounting (ACCT)
Commercial Law (CLAW)
Finance (FINC)
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 of ' Agricultural Economics and the Head of the Department concerned.

Bachelor of Resource Economics

Unit of study	Credit pointsi	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered

Regulations governing candidature for the BResEc degree are set out in the Resolutions (see Section 8). The degree requires a minimum of four years. The units prescribed are summarised below.

■ First Year (48 credit points; commenced in 2000)

AGEC 1031	Resource Economics 1	6	A) HSC 3 unit Mathematics.	*July*
ECON 1001	Introductory Microeconomics	6	A) HSC 2 unit Mathematics.	*February*
and 12 credit points from standard biology or land and water science.				
BIOL 1001	Concepts in Biology	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1901.	*February*
and				
BIOL 1002	Living Systems	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1902.	*July*
or				
BIOL 1003	Human Biology	6	A) HSC 2-unit Biology course. N) May not be counted with BIOL 1903.	*July*
or from advanced level BIOL 1901 and 1902 orl903; or				
LWSC 1001	Land and Water Science IA	6		*February*
LWSC 1002	Land and Water Science 1Bi	6	C) (LWSC1001) Land and Water Science IA.	*July*
and 12 credit points from First year 1Chemistry				
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.	*February*
CHEM 1002	Fundamentals of Chemistry 1B	6	P) CHEM 1001 or equivalent. N) May not be counted with CHEM 1102 or 1902 or 1904.	*July*
or from standard level CHEM 1101 Chemistry 1A and 1102 Chemistry 1B; or from advanced level CHEM 1901 Chem IA (Adv)and CHEM 1902 Chem 1B (Adv); and 12 credit points from standard level mathematics.				
MATH 1001	Differential Calculus	3	A) HSC 3-unit Mathematics. N) May not be counted with MATH 1901 or 1011.	*February*
MATH 1002	Linear Algebra	3	A) HSC 3-unit Mathematics. N) May not be counted with MATH 1902 or 1012.	*February*
MATH 1003	Integral Calculus and Modelling	3	A) HSC 4-unit Mathematics or MATH 1001. N) May not be counted with MATH 1903 or 1013.	*July*
MATH 1005	Statistics	3	A) HSC 2-unit Mathematics. N) May not be counted with MATH 1905 or 1015.	*July*
or from advanced level MATH1901 and 1902 and 1903 and 1905.				

■ Second Year (48 credit points)

AGEC 2001	Commodity Price Analysis 2	8	P) Agricultural Economics I or AGEC 1002 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004) or ECON 1001.	*February*
AGEC 2003	Production Economics 2	8	P) Agricultural Economics 1 or AGEC 1001 or AGEC 1031 orECON2001 or Economics II or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004).	*July*
AGEC 2005	Applied Commodity Modelling 2	4	P) Econometrics I or (ECMT1010 and ECMT1020) or (MATH 1001 and 1002 and 1003 and 1005) Econometrics I or (ECMT1010 and ECMT1020) or (MATH 1001 and 1002 and 1003 and 1005). N) AGEC2006 and AGEC2007.	*February*
ECON 1002	Introductory Macroeconomics	6	A) HSC 2 unit Mathematics.	*July*

Bachelor of Resource Economics - continued

Unit of study		Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered
ECON 2001	Intermediate Microeconomics	8	P) ECON1001. Students who have completed first year units in the Political Economy program may transfer to ECON2001 upon passing an examination arranged by the department. C) ECMT1010. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Faculty.*	*February*
GEOG 2001	Processes in Geomorphology	8	P) GEOG 1001 or ENVI 1002. N) Other Information: A candidate who has completed 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken GEOG 1001 or 1002 may apply under Section 1 (4) for permission to enrol in any Intermediate Geography unit of study. The School of Geosciences is not normally prepared to support applications under Section 1 (4) to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed four Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study.	*February*
GEOG 2302	Fluvial Geomorphology and Hydrology		*NB: Not offered in 2000.*	
or				
GEOG 2002	Fluvial and Coastal Geography	8	P) GEOG 1001 or ENVI 1002. N) Other Information: As for GEOG 2001.	*July*

■ Third Year (48 credit points)

AGEC 3002	Agricultural and Resource Policy 3	8	P) (AGEC2001 & AGEC2003) orECON2001 orECON2901 or Economics II.	*July*
AGEC 3031	Resource Economics 3	8	P) AGEC2003. *NB: Not offered in 2000.*	*February*
ECON 2002	Intermediate Macroeconomics	8	P) ECON1002. Students who have completed first year units in the Political Economy program may transfer to ECON2002 upon passing an examination arranged by the department. C) ECMT1020. *NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Faculty.*	*July*

ECON 3000 level (option);
together with 16 credit points chosen from Table 1 below.

■ Fourth Year (48 credit points)

AGEC 4031	Resource Economics Project 4	12	C) Any 32 credit points from AGEC4000 level. *NB: Not offered in 2000.*	*Full Year (starts Feb)*
AGEC 4041	Research Methods 4	4	P) AGEC2003 and AGEC2005.	*February*
ENVI 4803	Environmental Law	4		*February*

together with at least 12 credit points chosen from Table 3 below, and additional unit(s) if necessary, chosen from Table 2 below

Bachelor of Resource Economics - continued

Unit of study	Credit points	A) Assumed Knowledge Q) Qualifying P) Prerequisite C) Corequisite N) Prohibition	Offered

Elective units of study in the BResEc degree

■ Table 1: Electives for Third Year students

Units in the following discipline areas (Level 2 unless otherwise specified):
- agricultural economics (Level 3)
- agricultural chemistry
- animal science
- biology
- chemistry
- crop sciences
- economics (Level 2 or 3)
- environmental science
- geography (Level 2 or 3)
- geology
- land and water science
- mathematics
- marine science
- resource economics (Level 3)
- soil science.

■ Table 2: Electives for Fourth Year students

Units 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 sciences
- economics
- environmental science
- geography
- geology
- land and water science
- mathematics
- marine science
- resource economics (Level 3 or 4)
- soil science.

■ Table 3: Resource Economics electives for Fourth Year students

AGEC 4032	Methods of Non-Market Valuation 4	4	P) AGEC3031. *NB: Not offered in 2000.*	*February*
AGEC 4033	Minerals and Energy Economics 4	4	P) AGEC3002. C) AGEC3031. *NB: Not offered in 2000.*	*July*
AGEC 4034	Renewable Resource Economics 4	4	P) AGEC3031. *NB: Not offered in 2000.*	*February*
AGEC 4035	Environmental Economics 4	4	P) AGEC3002. *NB: Not offered in 2000.*	*July*
AGEC 4036	Water Economics 4	4	P) AGEC3031. *NB: Not offered in 2000.*	*July*

CHAPTER 3

Undergraduate units of study

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

Accounting in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Department of Accounting 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 1001 **Accounting IA**
6 credit points
Ms Gordon
Assumed knowledge: 2 unit Maths. **Offered:** February, July. **Classes:** (2 lectures, 1 tutorial & 1 practical)/week. **Assessment:** One 3hr exam, 2 tests/sem, weekly assignments.
NB: 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 assumed.

ACCT 1002 **Accounting 1B**
6 credit points
Dr Raymond Da Silva Rosa
Prerequisite: ACCT 1001. **Offered:** February, July. **Classes:** (2 lectures, 1 tutorial & 1 workshop)/week. **Assessment:** One 1 hr mid semester test, one 3hr final exam, 1 computing test, 1 financial statement analysis assignment and weekly assignments.
NB: 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 is designed to help students develop the necessary analytical, written and oral communication skills.

ACCT 1003 **Financial Accounting Concepts**
6 credit points
Ms Joanne Pickering
Prohibition: Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002. **Offered:** February. **Classes:** 2 lectures/week. **Assessment:** One 3hr exam, mid-sem 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. 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 1B. If students have successfully completed Financial Accounting Concepts and Management Accounting Concepts and have gained a place in the Accounting quota code 500 by applying through UAC, they may be exempted from enrolling in Accounting IA and 1B after having passed a cross-over examination. This examination will be available only to students who have gained a place in the code 500 quota.

ACCT 1004 **Management Accounting Concepts**
6 credit points
Prohibition: Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002. **Offered:** July. **Classes:** (3 lectures - one 2hr lecture, one 1 hour lecture)/week. **Assessment:** One 3hr exam, a mid-semester test and 2 assignments.
The aim is to explain how accounting information is used by managers. Topics include: estimating cost functions, relevant costing, cost allocation and discounted cash flow analysis. Topical matters drawing on the "different costs for different purposes" theme highlight the problematic nature of cost and its implication, for example, of identifying the "cost" of making a local phone call when there are various companies in the phone service chain, or how to "cost" a university degree. As well, students are taught to interpret a management performance report and to recognise the interrelationships between performance evaluation and asset valuation.

Note: Only available in the BEc, BEc(SocSc) and BAgrEc degrees and cannot be counted with Accounting IA and 1B. If students have successfully completed Financial Accounting Concepts and Management Accounting Concepts and have gained a place in the Accounting quota code 500 by applying through UAC, they may be exempted from enrolling in Accounting IA and 1B after having passed a cross-over examination. This examination will be available only to students who have gained a place in the code 500 quota.

ACCT 2001 **Financial Accounting A**
8 credit points
Dr Arthur
Prerequisite: ACCT 1001 and ACCT 1002. **Corequisite:** ECMT 1010 and ECMT 1020. **Offered:** July. **Classes:** (3 lectures & 1 tutorial)/week. **Assessment:** One 1000w essay. One 1.5 hr exam, one 3hr exam, weekly assignments.
Accounting and reporting practices of companies, particularly listed public companies. Emphasis is placed on developing an understanding of, and the ability to evaluate critically, the various regulatory requirements (professional and statutory) governing financial reporting. The economic significance of management's ability to choose between alternative techniques for recording/reporting a given transaction or event is also considered from within a 'costly contracting' framework. Issues covered include accounting for income taxes, leases, employee entitlements, intangibles, extractive industries. Consideration of off-balance sheet liabilities and owner's equity. Introduction to intercorporate investments.

ACCT 2002 **Management Accounting A**
8 credit points
Mr Blayney
Prerequisite: ACCT 1001 and ACCT 1002. **Corequisite:** ECMT 1010 and ECMT 1020. **Offered:** February. **Classes:** (2 lectures, 1 tutorial & 1 practical)/week. **Assessment:** One 3hr exam, weekly assignments.
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, detailed

study of the budgeting process (master budgets, flexible budgets, standard costing and variance analysis) and cost allocation.

ACCT 2003 Accounting and Business Processes

8 credit points

Prerequisite: ACCT 1002. Offered: July. Classes: (2 lectures, 1 workshop/practical, 1 tutorial)/week. Assessment: Final examination, one test, assignments, groupwork.

This unit is designed to help you 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

Prerequisite: ACCT 2001. Offered: February. Classes: (2 lectures, 1 tutorial & 1 workshop)/week. 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

Mr Peter Edwards

Prerequisite: ACCT 2002. **Offered:** July. **Classes:** (2 lectures, 1 tutorial & 1 practical)/week. **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

Prerequisite: CHEM 1001 and CHEM 1002 or CHEM 1901 and CHEM 1902 or First Year Chemistry. **Offered:** February. **Classes:** 41 lec & 70 prac. **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 3004 Chemistry and Biochemistry of Ecosystems 3

8 credit points

Prof. Kennedy, Assoc. Prof. Copeland, Dr Caldwell, Dr Lees

Prerequisite: AGCH 2002. Offered: July. Classes: (3 lec & 5 prac)/wk. Assessment: One 3hr exam, prac, assignment.

This is a unit of study in environmental chemistry designed for students who intend to specialise in their 4th year in Agricultural Chemistry or Soil Science, or in environmentally-related areas of crop and animal sciences, entomology, horticulture, microbiology, plant and animal genetics and plant pathology. The specific objectives of the unit of study are to:

(i) provide students with an understanding of chemical and biochemical processes in ecosystems, in particular the various elemental cycles, inclusive of environmental impacts arising from disturbances in natural processes and contamination from other human activity; and

(ii) teach students practical skills in chemical and biochemical methods of analysis used in environmental chemistry.

The unit of study builds on students' basic knowledge of physical, organic and analytical chemistry, and biochemistry to develop knowledge and understanding of chemical and biochemical processes and cycles in ecosystems. It aims to teach the principles important in understanding and sustaining our national plant-soil resources, with an emphasis placed on the acquisition of relevant laboratory skills in chemical analysis.

The lecture topics will include: the biological/environmental carbon cycle; bioenergetics of autotrophy and heterotrophy, photosynthesis, fermentation, eutrophication; the mineral nutrient cycles, uptake and utilisation by organisms, pH balancing; the biological/environmental nitrogen cycle; ammonification, nitrification of ammonia, denitrification of nitrate, nitrogen fixation, ammonia and nitrate assimilation; the biological/environmental sulphur cycle; sulphate assimilation, sulphate reduction and dissimilation in soil and water; the role of the nitrogen and sulphur cycles in the acidification of ecosystems; effects of acidification on plants and animals; pesticides and herbicides, chemistry, modes of action, metabolism and detoxification; environmental chemistry and fate of pesticides; design of new pesticides and means of pest control; heavy metals and plants, mechanisms of tolerance, hyperaccumulators, halophytes.

Practical: The laboratory exercises will include sample preparation and analyses of environmental samples for organic and inorganic nutrients, products and contaminants including heavy metals and pesticides. Skills will be acquired in gas, liquid and ion chromatography, atomic absorption spectroscopy, electrochemical methods, mass spectrometry and the use of immunoassay.

AGCH 3005 Food Chemistry and Biochemistry (Agriculture) 3

8 credit points

Assoc. Prof. Copeland, Dr Caldwell, Dr Lees

Prerequisite: AGCH 2002. **Offered:** February. **Classes:** (3 lec & 5 prac)/wk. **Assessment:** One 3hr exam, prac, assignment.

This unit of study aims to:

(i) give students an understanding of the constituents of foods and fibres and

(ii) teach students practical skills in chemical and biochemical methods of analysis used in laboratories of enterprises concerned with the processing of agricultural products, and in the food and beverage industries.

The lecture topics cover, in a context of foods, the main principles of the regulation of metabolic processes; properties, be-

haviour and metabolism of carbohydrates, including photosynthetic carbon assimilation, sucrose and other oligosaccharides, starch and non-starchy polysaccharides, properties, behaviour and metabolism of fatty acid and lipids, properties, behaviour and metabolism of proteins, toxic and anti-nutritional constituents of foods; characteristics of cereal and legume grains in relation to quality and end use of products, solution properties of biological macromolecules, natural fibrous and gel-forming macromolucules, uses in foods and other commercial products, chemistry of doughs and breadmaking, chemistry of fermentation processes in food industries.

Practical: The laboratory work includes exercises on properties of enzymes, and sample preparation and analyses of foods and other biological materials using spectroscopic, enzymic, and chromatographic (including GC and HPLC) and electrophoretic methods.

AGCH 3012 **Rural Environmental Chemistry**

4 credit points
Prerequisite: ENVI 2003, 2004, 2103 and 2104 (From year 2001: ENVI 2001 and 2002). **Corequisite:** ENVI 3001. **Offered:** February. **Classes:** 1 two hour tutorial and laboratory session per week. A 6-day field trip held in Orientation week. **Assessment:** Practical Assessment (report) (100%).

NB: This unit of study is offered only to students enrolled in the BSc(Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor.

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.

Offered only to students enrolled in the BSc(Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor.

AGCH 3014 **Chemistry and Biochemistry of Ecosystems 3LWS**

4 credit points
Assoc Prof Copeland, Dr Caldwell, Dr Lees
Prerequisite: AGCH 2002. **Offered:** July. **Classes:** (3 lec & 1 tut)/ week. **Assessment:** 1 exam, assignment.

This unit of study is a compulsory component of the Level 3 program for the BLWSc degree. It aims to provide students with an understanding of chemical and biochemical processes in ecosystems, in particular of the various elemental cycles, inclusive of environmental impacts arising from disturbances in natural processes and contamination from human activity. The lecture topics will include: the biological/environmental carbon cycle; bioenergetics of autotrophy and heterotrophy, photosynthesis, fermentation, eutrophication, the mineral nutrient cyles, uptake and utilisation by organisms, pH balancing; the biological/environmental nitrogen cycle; sulphate assimilation, sulphate reduction and dissimilation in soil and water; the role of nitrogen and sulphur cycles in the acidification of ecosystems; effects of acidification on plants and animals; pesticides and herbicides, chemistry, modes of action, metabolism and detoxification; environmental chemistry and fate of pesticides; design of new pesticides and means of pest control; heavy metals and plants, mechanisms of tolerance, hyper accumulators, halophytes.

AGCH 3016 **Agricultural Biotechnology 3**

4 credit points
Assoc. Prof. L Copeland
Assumed knowledge: AGCH 2002, GENE 2001, MICR 2101, ANSC 2002 and CROP 2001, or the equivalent of these units.
Offered: July. **Classes:** (2lec/wk, 6 tutorials, 5x4h practicals).
Assessment: Assignments (20%), 1 x 3hr exam (60%) Pracxtical 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 4002 **Agricultural Chemistry 4A**

24 credit points
Prerequisite: AGCH 3004 or AGCH 3005. **Offered:** February.

The unit of study aims to: provide students with problem-solving and communication skills required by professional chemists 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 will include:

Research Methods in Agricultural and Biological Chemistry
(8 credit points)

Students attend a series of workshops on scientific communication and prepare two essays each of 5000 words on topics of their choice selected from a list which covers a wide range of basic and applied areas of biological, environmental and food chemistry.

Chemistry and Biochemistry of Agricultural and Food Products and the Environment
(16 credit points)

An advanced series of lectures and laboratory classes in biological and environmental chemistry and agricultural biochemistry. The areas covered will depend on which of the optional third year Agricultural Chemistry units of study students have completed.

Research Project
(24 credit points)

Students carry out a short research project under close supervision of a member of the staff. Projects are usually available in one of the following areas of research interest within the Department: carbon and nitrogen metabolism in a variety of crop plants; biological nitrogen fixation; biochemistry of herbicides and pesticides; nutritional aspects of seed proteins; applied enzymology; organic and inorganic residues in agricultural products. Students who are interested in working in another area are invited to discuss their ideas with a member of the staff.

AGCH 4003 **Agricultural Chemistry 4B**

24 credit points
Corequisite: AGCH 4002. **Offered:** July.
See AGCH 4002 Agricultural Chemistry 4A.

AGCH 4004 **Cereal Science 4A**

24 credit points
Prerequisite: AGCH 3005. **Offered:** February.

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

Research Methods and Communications Skills
(8 credit points)

Students receive training in oral and written scientific communication and attend a program of seminars and workshops. Students research the literature and prepare 2 essays of approximately 5000 words each and an oral presentation on topics of their choice selected from a list which covers basic and applied aspects of cereal science.

Methods of Analysis of Cereal Products

(8 credit points)

A program of advanced laboratory work aimed at providing training in the main methods of chemical and biochemical analysis used in the cereal and food industries. Each laboratory exercise will include library research, development of some of the experimental protocols, preparation of necessary reagents and apparatus, and completion of a written report.

Coursework

(8 credit points)

Selected with approval of the Coordinator of the Program.

Students select 8 credit points of 3rd or 4th year units of study in areas relevant to cereal science (eg chemistry, biochemistry, molecular biology, genetics, nutrition, agribusiness, marketing). The selection of units of study will depend on which subjects students have completed prior to entering 4th Year and will be subject to the approval of the Coordinator of the Program.

Research project

(24 credit points)

Students carry out a research project on an aspect of cereal science under the supervision of a member of staff in a Department in the Faculty of Agriculture or in another location approved by the Coordinator of the Program.

AGCH 4005 **Cereal Science 4B**

24 credit points

Corequisite: AGCH 4004. **Offered:** July.

See Cereal Science 4A.

AGEC1001 **Agricultural Economics 1A**

6 credit points

Assumed knowledge: HSC 2 unit Mathematics. **Offered:** February. **Classes:** (3 lec & 1 tut)/wk. **Assessment:** One 3 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 bom 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

W. Obst et al. Agribusiness: Financial Management (Federation Press, 1999)

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

Corequisite: AGEC 1001. **Assumed knowledge:** HSC 2 unit Mathematics. **Offered:** July. **Classes:** (3 lec & 1 workshop)/wk. **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 word-processor.

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 Australian Agriculture 1A**

3 credit points

Assumed knowledge: HSC 2 unit Mathematics. **Offered:** February. **Classes:** (2 lec & 1 tut)/wk. **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 Modern 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 Australian Agriculture 1B**

3 credit points

Corequisite: AGEC 1003. **Assumed knowledge:** HSC 2 unit Mathematics. **Offered:** July. **Classes:** (2 lec & 1 tut)\wk. **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. 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 1031 **Resource Economics 1**

6 credit points

Assumed knowledge: HSC 3 unit Mathematics. **Offered:** July. **Classes:** (3 lec & 1 workshop)/wk. **Assessment:** One 2.5hr 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

Prerequisite: Agricultural Economics I or AGEC 1002 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004) or ECON 1001. Offered: February. 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.

Textbooks

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

Reference Books

RG. 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

Prerequisite: Agricultural Economics 1 or AGEC 1001 or AGEC 1031 or ECON 2001 or Economics II or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004). Offered: July. Classes: (3 lec & 2 workshop)/wk. 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 CR. 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

Prerequisite: Econometrics I or (ECMT 1010 and ECMT 1020) or (MATH 1001 and 1002 and 1003 and 1005) Econometrics I or (ECMT 1010 and ECMT 1020) or (MATH 1001 and 1002 and 1003 and 1005). Prohibition: AGEC 2006 and AGEC 2007. Offered: February. Classes: (2 lec & 1 tut/lab session)/wk. 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 2006 **Applied Commodity Modelling Theory 2**

2 credit points

Prerequisite: Econometrics I or (ECMT 1010 and ECMT 1020) or (MATH 1001 and 1002 and 1003 and 1005). **Prohibition:** AGEC 2005. **Offered:** February. **Classes:** 2 lec/wk. **Assessment:** One 1 hr exam, assignments.

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.

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 2007 **Applied Commodity Modelling Practical** 2

2 credit points

Prerequisite: AGEC 2006. **Prohibition:** AGEC 2005. **Offered:** July. **Classes:** One 2hr lab/wk. **Assessment:** One 1 hr prac exam, assignments.

Formulation of simple regression models. Estimation and testing under classical assumptions. Formulation of multiple regres-

sion models and use of ordinary least squares estimation method. Hypothesis testing under classical assumptions. Modelling using dummy variables and lag variables. Empirical procedures for coping with deterministic model mis-specification. Examining data to test for the classical stochastic assumptions and implementing improved methods of estimation when needed.

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

Prerequisite: AGEC 2003 or Economic Environment of Australian Agriculture or (AGEC 1003 and AGEC 1004). **Offered:** February. **Classes:** (3 lec & 2 workshop)/wk. **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. Hardaker et 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 3

8 credit points

Prerequisite: (AGEC 2001 & AGEC 2003) or ECON 2001 or ECON 2901 or Economics II. **Offered:** July. **Classes:** (3 lec & 1 tut)/wk. **Assessment:** One 2-1 /2hr exam 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

Prerequisite: AGEC 2003 and AGEC 2002 or AGEC 2005 or (AGEC 2006 and AGEC 2007) or ECMT 2020. **Offered:** February. **Classes:** (3 lec & 1 lab)/wk for 6 weeks. **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 (Roudedge, 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

Prerequisite: AGEC 2003. **Offered:** February. **Classes:** (3 lec & 2hr lab session)/wk. **Assessment:** One 3 hr exam, assignments.

NB: Not offered in 2000.

This unit has two components. The first half deals with non-market priced 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 environemntal management. The second part of the unit deals witfi 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 methods (optimal control and dynamic programming) for identifying optimal solutions. Example applications may include mining, forest rotations, waste absorptive capacity, recruitment and harvesting of natural populations.

Textbooks

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

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

N.Hanley and C.L. Splash Cost-Benefit Analysis and the Environment (Edward Elgar, 1993)

AGEC 4001 **Research Project 4**

16 credit points

Corequisite: Any 24 credit points from Level 4000 AGEC units. **Offered:** Full Year (starts Feb). **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 in groups 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 Research Project.

AGEC 4003 Applied International Trade 4

8 credit points

Prerequisite: AGEC 2001 or Economics II or (ECON 2001 and ECON 2002) or (ECON 2901 and ECON 2902). **Offered:** February. **Classes:** (3 lec & 1 tut)/wk. **Assessment:** One 3hr exam, 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 cov-

ered 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 4**

8 credit points

Prerequisite: AGEC 2001 or (AGEC 1003 & AGEC 1004) or Economic Environment of Australian Agriculture or Economics II or ECON 2001 or ECON 2901. **Offered:** July. **Classes:** (3 lec & 1 tut/ excursion)/wk. **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.Wolverton and J.C.Beierlein Introduction to Agribusiness Marketing [Prentice-Hall, 1994]

AGEC 4005 **Natural Resource Economics 4**

8 credit points

Prerequisite: (AGEC 2001 and AGEC 2003) or Economics II or (ECON 2001 and ECON 2002). Offered: July. Classes: (3 lec & 1 tut)/wk. 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; sustainabiliry. Applications include land degradation, fisheries, forestry, land-use planning and the enhanced greenhouse effect.

Textbooks

S. C.Hackett Environmental and Natural Resource 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 **Special Topics in Agricultural and Resource Economics 4**

8 credit points

Offered: February, July. Classes: 1 tut/wk. Assessment: One 2hr exam, assignments/essays, term paper.

This unit deals with the specialised areas of agricultural and resource economics ofparticular 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

Prerequisite: AGEC 2003. **Corequisite:** AGEC 3001 or AGEC 3031. **Offered:** February. **Classes:** (3 lec & 1 tut/lab session)/wk for first 7 weeks of semester. **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 and Risk Management 4**

4 credit points

Prerequisite: AGEC 2003. Corequisite: AGEC 3001 or AGEC 3031. Offered: February. Classes: (4 lec & 1 tut/lab session)/wk for 6 weeks. 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

Corequisite: AGEC 4011 and at least 12 other level 4 AGEC credit points. **Offered:** February. Classes: 2 lec/wk. **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
Corequisite: AGEC 4010 and at least 12 other level 4 AGEC credit points. **Offered:** July. **Classes: 2** lec/wk. **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 4020 Agricultural Economics 4A
24 credit points
Prerequisite: AGEC 2001, AGEC 2003. **Corequisite:** AGEC 4021 Agricultural Economics 4B. **Offered:** February.
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
Prerequisite: AGEC 2001, AGEC 2003. **Corequisite:** AGEC 4020. **Offered:** July.
See AGEC 4020 Agricultural Economics 4A.

AGEC 4022 Agribusiness 4A
24 credit points
Prerequisite: AGEC 3001, 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4023. **Offered:** February.
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 fliird 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
Prerequisite: AGEC 3001, 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4022. **Offered:** July.
See AGEC 4022.

AGEC 4024 Resource Economics 4A
24 credit points
Prerequisite: AGEC 2001, AGEC 2003 and 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4025. **Offered:** February.
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
Prerequisite: AGEC 2001, AGEC 2003 and 24 credit points of 3rd year Agr Sc. **Corequisite:** AGEC 4024. **Offered:** July.
See AGEC 4024 Resource Economics 4A.

AGEC 4027 Introductory Land and Water Economics
4 credit points
Offered: February. **Classes:** 2 lec/wk. **Assessment:** One **2 hr** exam, assignments.
NB: Not offered in 2000.
An overview is provided of economic analysis of natural resources in the context of making choices about resource use. Initial lectures sketch the need for economic principles in analysing resource use, and develop basic economic principles for evaluating production and consumption of commodities. Property rights and time are emphasised as key areas where basic economic principles require modifying in a resources context: these principles are used to develop tools of economic analysis in benefit-cost analysis; economics of pollution; and optimising use of natural resources over time. Six particular natural resource problems are examined: agricultural and urban water supply; blue-green algae; intractable waste; sustainable development; population and food supply; and the enhanced greenhouse effect.
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 4031 **Resource Economics Project 4**

12 credit points

Corequisite: Any 32 credit points from AGEC 4000 level. **Offered:** Full Year (starts Feb). **Assessment:** Thesis or project reports.

NB: Not offered in 2000.

In this unit of study, students develop skills for researching the economics of bio-physical systems. Students design, undertake and reporte on either a single research study (thesis) or several smaller research exercises. For a thesis, students undertake research on an approved topic in resource economics under the supervision of a member of staff and prepare a report of approximately 20,000 words in length. Students undertaking research exercises typically work in groups on three 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 Research Project.

AGEC 4032 **Methods of Non-Market Valuation 4**

4 credit points

Prerequisite: AGEC 3031. **Offered:** February. **Classes: (2** lec **& 1 tut)/wk. Assessment:** One 2 hr exam, assignments.

NB: Not offered in 2000.

The unit first examines the various sources of value obtainable from non-marketed goods and services including use values and non values such as existence and option value. The role of valuations in ensuring efficient levels of supply and allocation of such goods and services is reviewed. Problems in specifying the discount rate are discussed. Alternative methods of valuation studied include direct methods (contingent valuation, experiments) and indirect methods (hedonic pricing, travel cost and other surrogate market methods; replacement and dose-response functions) These are examined theoretically and empirically. The use of non-market valuations in cost-benefit analyses of the environment and resource projects is explored.

Textbooks

N.Hanley and C.L. Splash Cost-Benefit Analysis and the Environment (Edward Elgar, 1993)

P-O. Johansson Cost-Benefit Analysis of Environmental Change (Cambridge U.P., 1993)

AGEC 4033 **Minerals and Energy Economics 4**

4 credit points

Prerequisite: AGEC 3002. **Corequisite:** AGEC 3031. **Offered: July. Classes:** (2 lec & 1 tut)/wk. **Assessment:** One 2 hr exam, assignment.

NB: Not offered in 2000.

AGEC 4034 **Renewable Resource Economics 4**

4 credit points

Prerequisite: AGEC 3031. **Offered:** February. **Classes:** (2 lec & 1 tut)/wk. **Assessment:** One 2 hr exam, assignments.

NB: Not offered in 2000.

AGEC 4035 **Environmental Economics 4**

4 credit points

Prerequisite: AGEC 3002. **Offered:** July. **Classes: (2** lec **& 1 tut)/ wk. Assessment:** One 2 hr exam, assignments.

NB: Not offered in 2000.

AGEC 4036 **Water Economics 4**

4 credit points

Prerequisite: AGEC 3031. **Offered:** July. **Classes:** (2 lec & 1 tut)/ wk. **Assessment:** One 2 hr exam, assignments.

NB: Not offered in 2000.

AGEC 4041 **Research Methods 4**

4 credit points

Prerequisite: AGEC 2003 and AGEC 2005. **Offered:** February. **Classes:** (3 lec & 1 lab)/wk for 6 weeks. **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 deductive logic; creativity; research as an orderly process of enquiry; preparation of research proposals; secondary data sources for agricultural and resource economists; collection of primary data; statistical design of sample surveys; questionnaire construction; interviewing techniques; and methods of analysis of survey data. Topics are illustrated with examples of research in theoretical economics, empirical discipline-advancing research, empirical exploratory research, and research using policy-evaluation modelling.

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)

AGRF 4000 **Professional Experience**

Michele Gairn

Offered: February, July.

Requirements for the 18 weeks outlined in Chapter 7, 'Other Faculty information'.

AGRF 4001 **Special Program 4A**

24 credit points

Offered: February.

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

Offered: July.

See Special Program 4A.

AGRO 2002 **Crop and Pasture Agronomy 2**

6 credit points

Offered: July. Classes: (2 lec & 1 tut)/wk. Assessment: One 2hr exam, one essay divided into a sequence of chapters.

Lectures cover the agronomic and ecological principles of crop and pasture production, together with fanning systems in summer and winter rainfall zones and semi arid areas. Broad scale resource and environmental issues such as soil acidification, agricultural pollution and salinity amelioration will be discussed. The tutorials will lead students through their own consultant's report on the agronomic and management opportunities provided by a farm or region of their choice. The students will be required to identify the soil and climate resources and the supporting infrastructure and bring these together to create and recommend fanning and grazing enterprises for the future.

Reference books

J.E. Pratley (ed.) Principles of Field Crop Production (Sydney U.P., 1988)

P.V. Charman and B.W. Murphy Soils: Their Properties and Management (Sydney U.P., 1991)

AGRO 3001 **Agronomy 3**

8 credit points

Dr Jacobs

Prerequisite: AGRO 2002 or CROP 1001 or HORT1001. **Offered:** February. **Classes:** (3 lec, 3hr prac & 2hr seminar)/wk. **Assessment:** One 2hr exam(50%), assignment(40%), oral presentations^ 0%).

The central theme is the need to emphasise sustainability and environmental responsibility in agricultural production. The many techniques which are available to address difficulties in agricultural production systems will be examined and there will be opportunity to devise systems to correct and manage potential problems such as salinity, water logging, erosion and soil breakdown. The pasture agronomy component will produce an understanding of the ecological basis of pasture management and address modern methods of maximising grazing animal pro-

duction while sustaining and improving the natural resource base. The unit of study will be an integrated whole recognising the significant role pastures have in conserving the rural environment as well as producing sustenance for the livestock therein.

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 farming - 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)

AGRO 4001 Agronomy 4A

24 credit points

Mr de Kantzow

Prerequisite: AGRO 3001. **Offered:** February.

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 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 dieir 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 agricultural 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), Pro Graze (a pasture management course) and product utilization and processing (flour milling, starch manufacture).

Research Project and Thesis

12 or 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.

Turf Management

6 credit points. Coordinator: Adj. Prof. Martin. Offered: March. Assessment: one 2hr exam, assignments.

Lectures, workshops and field visits centred on the theme of 'turf: a self-contained system'. Students address the scientific issues underlying the design, construction, grassing and maintenance of turf facilities: construction of desired soil profiles, nutrition, micro- and macro-environment of turf, water management, physiology of growth under turf conditions. Environmental legislation and emerging issues for turf management.

AGRO 4002 Agronomy 4B

24 credit points

Prerequisite: AGRO 3001. **Corequisite:** AGRO 4001. **Offered:** July.

See AGRO 4001 Agronomy 4A.

ANSC 2002 Animal Science 2

6 credit points

Assoc. Prof. Maxwell, Dr R. Taylor, Assoc. Prof. Stone, Assoc. Prof. Gooden, Dr M. Hyde, Dr D. Evans, Prof. M. Bryden,

Prerequisite: CROP 1001 and CROP 1002 or HORT 1001 and HORT1002. **Corequisite:** AGCH 2002. **Offered:** July. **Classes:** 51 lec & 39hr prac. **Assessment:** 80% exam (one 3hr paper), 20% 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)

ANSC2003 **Animal Science 2AE**

4 credit points

Assoc. Prof. Maxwell, Assoc. Prof. Gooden, Dr Hyde, Camden staff

Offered: July. Classes: 19 lec & six 4hr prac classes. Assessment: One 1.5hr exam, one research project/assignment.

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. In addition, students will complete a project involving economic analysis of an animal enterprise.

ANSC 3001 **Animal Nutrition 3**

8 credit points

Dr Hyde, Assoc. Prof. Balnave, Prof. D. Fraser

Prerequisite: ANSC 2002. **Offered:** February. **Classes:** 12hr tut, 12 pracs, 2 excursions, 18hr project. **Assessment:** One 2hr exam(40%), two assignments (30%), project (20%), quiz (5%), self-assessment (5%).

This is an 8 credit point program, held in March Semester. It consists of 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

Prerequisite: ANSC 2002. **Offered:** July. **Classes:** (3 lec)/wk; 52hr prac, 13hr tut. **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, Assoc. Prof. Stone, Assoc. Prof. Bryden

Prerequisite: ANSC 2002. **Offered:** February. **Classes:** 49 lec & 52hr prac/tut. **Assessment:** One 2hr exam(50%), tests (20%), 2 assignments (15% 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 and digestion.

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

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, Dr D. Evans, Dr McGreevy, Dr Collier, Assoc. Prof. W. Bryden, Assoc.Prof. Stone, Associate Professor Balnave

Prerequisite: ANSC 2002. **Offered:** July. **Classes:** 45 lec & 54hr prac/tut. **Assessment:** One 2hr exam(50%), tests [20%],prac exam (15%), assignment (15%).

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 and avian structure and function.

Textbooks

Same as ANSC 30O3Animal 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

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). **Corequisite:** Agricultural Biotechnology (AGCH 3016). **Offered:** July. **Classes:** (1hr lect, 1 hr tut, 2 hrs of supervised reading, seminars, excursions, computer aided instruction)/wk. **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 inirco-organism 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, bioinformatics, 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

Prerequisite: ANSC 3001, ANSC 3002, ANSC 3003. **Offered:** February.

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: meats, poultry, genetics, biotechnology, dairying, wool, and control of animal diseases. About 30 per cent of the time available is spent on project work, for which students undertake projects in the various sections of the Department of Animal Science at Camden or Sydney

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)
F W 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
Prerequisite: ANSC 3001, ANSC 3002, ANSC 3003. **Corequisite:** ANSC 4001. **Offered:** July.
See Animal Production 4A.
Textbooks
See Animal Production 4A

Asian Studies units in the Bachelor of Agricultural Economics

8 credit points

ASNS 2601 **Asian Studies 1A (Japanese)**

4 credit points
Ms Yasumoto
Offered: February.
Students attend classes for either JPNS 1011 or JPNS 1111. See relevant course descriptions.

ASNS 2602 **Asian Studies 1B (Japanese)**

4 credit points
Ms Yasumoto
Prerequisite: ASNS 2601. **Offered:** July.
Students attend classes for either JPNS 1012 or JPNS 1112. See relevant course descriptions.

ASNS 2603 **Asian Studies 2A (Japanese)**

4 credit points
Ms Yasumoto
Prerequisite: ASNS 2602. **Offered:** February.
Students attend classes for either JPNS 2011 or JPNS 2111. See relevant course descriptions.

ASNS 2604 **Asian Studies 2B (Japanese)**

4 credit points
Ms Yasumoto
Prerequisite: ASNS 2603. **Offered:** July.
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
Prerequisite: ASNS 2604. **Offered:** February.
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
Ms Yasumoto
Prerequisite: ASNS 3601. **Offered:** July.
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
Assumed knowledge: HSC 2-unit Biology course. **Prohibition:** May not be counted with BIOL 1901. **Offered:** February. **Classes:** 3 lec & 3 prac/wk. **Assessment:** One 2hr 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, plants and animals. 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, 1995

BIOL 1201 **Biology-Agricultural Concepts**

4 credit points
Assumed knowledge: HSC 2 unit Biology. **Offered:** February. **Classes:** (3 lec & 3 prac)/wk. **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 synmesis 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
Assumed knowledge: BIOL 1201 or HSC 2 unitBiology. **Offered:** July. **Classes:** (3 lec & 3 prac)/wk. **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 2004 **Plant Ecology and Diversity**

8 credit points
Dr Henwood, Dr McGee, Dr Marc, Dr Quinnell, Dr Wardle
Qualifying: BIOL 1001 or 1901 and one of BIOL 1002,1902, 1003, 1903. **Prohibition:** May not be counted with BIOL 2904. **Offered:** February. **Classes:** 2 lec, 1 prac/audiovisual & 1 tut/wk. **Assessment:** One 3hrexam, 1 prac exam, one 1000w essay, classwork.
NB: 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.

BIOL **2101 Animals A-Theory**

4 credit points

Dr M B Thompson, Dr E L May

Qualifying: BIOL 1001 or 1901 and one of BIOL 1002,1902, 1003, 1903. Prohibition: May not be counted with BIOL 2001 or 2901. Offered: February. Classes: 3 lec & 1 prac/wk. Assessment: One 2hr theory exam, quizzes, one 1 hr prac exam.

NB: The content of BIOL 1002/1902 is assumed knowledge and students entering from BIOL 1003 or 1903 will need to do some preparatory reading. Not a prerequisite for Senior units of study in Biology. Students taking this unit concurrently with (or following completion of) BIOL 2004 or 2904 or 2006 or 2906 must complete 16 hours of alternative work in one unit, in place of the core material common to both units. Students taking BIOL 2101 concurrently with (orfollowing completion of) BIOL 2106 must complete 16 hours of alternative work in place of the core material common to both units, and if taking these units.concurrently, must elect at enrolment in which unit they wish to do the alternative work.

This unit of study provides a broad background to the diversity of animals through lectures and museum-style displays. The material is presented within the conceptual framework of evolution and the principles and use of phylogeny and classification. It is suitable for students who are majoring in other areas of biology or other subjects but who wish to acquire an introduction to animal biology. The unit of study is designed to be taken with Biology 2102 Animals B -Theory. The diversity, morphology and evolution of most invertebrate phyla are presented.

BIOL 2102 Animals B -Theory

4 credit points

Dr M B Thompson and Dr E L May

Qualifying: BIOL 1001 or 1901 and one of BIOL 1002, 1902, 1003, 1903. **Prohibition:** May not be counted with BIOL 2002 or 2902. **Offered:** July. **Classes:** 3 lec & 1 prac/wk. **Assessment:** One 2hr theory exam, quizzes, one 1 hr prac exam.

NB: The content of BIOL 1002/1902 is assumed knowledge and students enteringfrom BIOL 1003 or 1903 will need to do some preparatory reading. Not a prerequisite for Senior units of study in Biology. Students taking this unit concurrently with (or following completion of) BIOL 2003 or 2903 or 2002 or 2905 must complete 16 hours of alternative work in one unit, in place of the core material. Students taking BIOL2102 concurretnlty with (orfollowing completion of) BIOL2105 must complete 16 hours of alternative work as part of BIOL 2102 in place of core material common to both units.

This unit of study provides an introduction to the diversity of animals at the level of phylum. It provides a broad background in the diversity of animals and an introduction to phylogeny through lectures and demonstration material in laboratory classes. It focuses on vertebrates and invertebrate phyla not covered in Biology 2101 Animals A - Theory and includes an introduction to the terminology and processes of molecular genetics and recombinant DNA technology. This unit of study is designed to be taken with BIOL 2101 Animals A - Theory and should preferably be taken after that unit of study. It is suitable for students who are concentrating on other areas of biology or other units of study but who wish to acquire a background in animal 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 1001 Human Biology.

BIOM1001 Biometry 1

5 credit points

Assoc. Prof. M. O'Neill

Assumed knowledge: HSC 2 unit Mathematics. Offered: February. Classes: (2 lec & 3 tut/prac)/wk. 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 matrix methods, differentiation and integration as applied to growth curves and simple modelling, especially via the use of computers.

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 package 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.

BIOM1002 Environmetrics 1

6 credit points

Assumed knowledge: 2 unit Mathematics. Offered: July. Classes: (3 lec, 1 tut & 2 lab)wk. 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.

BIOM2001 Biometry 2

6 credit points

Dr. P. Thomson

Prerequisite: BIOM 1001. **Offered:** February. **Classes:** (3 lec, 2 prac & 1 tut)/wk. **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, Microsoft Word and Excel are used extensively to analyse and summarise experimental data.

The first part of the unit of study covers: describing biological data and variability in statistical terms, some theory of sampling and estimation, framing biological hypotheses; theory of hypothesis testing; estimating and testing a single treatment via a t-test, and extending to tests of 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 (re-

gression, 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. Curaow and A.M. Hasted Statistical Methods in Agriculture and Experimental Biology 2nd edn (Chapman & Hall, 1993)

BIOM 2002 **Environmetrics 2**

4 credit points

Prerequisite: BIOM 1002. Offered: February. Classes: (2 lec 1 tut &1 labjwk. Assessment: Assignments (15%), Quizzes (10%), Practical Test (25%). one 3hr exam (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 (e.g. 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

Prerequisite: BIOM 2001. **Prohibition:** BIOM 3001. **Offered:** February. **Classes:** 1 lec, 1 tut & 2 prac/wk. **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 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 repeat 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

Prerequisite: BIOM 2001. **Prohibition:** BIOM 3001. **Offered:** February. **Classes:** (1 lec, 1 tut & 2 pract)/wk. **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 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

Prerequisite: BIOM 3001. Offered: February.

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

Prerequisite: BIOM 3001. Corequisite: BIOM 4001. Offered: July.

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

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. **Offered:** February. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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 about 39 lectures, three per week throughout the semester.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 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

Prerequisite: CHEM 1001 or equivalent. **Prohibition:** May not be counted with CHEM 1102 or 1902 or 1904. **Offered:** July. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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 about 39 lectures, three per week throughout the semester.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 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

Corequisite: Recommended concurrent unit of study: Preferred - MATH 1001 and 1002 or 1901 and 1902; otherwise - MATH 1011 and 1012. **Assumed knowledge:** HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry. **Prohibition:** May not be counted with CHEM 1001 or 1901 or 1903. **Offered:** February, July. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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 chemistry component of the 4-unit or 3-unit HSC Science course or 2-unit Chemistry. 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 about 39 lectures, three per week throughout the semester.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 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

Qualifying: CHEM 1101 or a Distinction in CHEM 1001 or equivalent. **Corequisite:** Recommended concurrent unit of study: Preferred - MATH 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise - MATH 1004 and 1005 or 1013 and 1015. **Prohibition:** May not be counted with CHEM 1002 or 1902 or 1904. **Offered:** February, July. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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 about 39 lectures, three per week throughout the semester.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 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

Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - MATH 1001 and 1002 or 1901 and 1902; otherwise - MATH 1011 and 1012. **Prohibition:** May not be counted with CHEM 1001 or 1101 or 1903. **Offered:** February. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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 (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 10 three-hour laboratory sessions, one per week for 10 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

Qualifying: CHEM 1901 or 1903 or Distinction in CHEM 1101 or equivalent; by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - MATH 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904, otherwise - MATH 1013 and 1015 or 1004 and 1005. **Prohibition:** May not be counted with CHEM 1002 or 1102 or 1904. **Offered:** July. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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 (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 10 three-hour laboratory sessions, one per week for 10 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 Department of Accounting 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

Offered: February, July. **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 and trusts.

CLAW 1002 Commercial Transactions B

6 credit points

Prerequisite: CLAW 1001. **Offered:** July. **Classes:** (3 lectures & 1 tutorial)/week. **Assessment:** One 3hr exam, assignment, quiz, classwork.

Provides a background in property law including: sale of goods, implied terms, passing of property, passing of title by a non-owner, retention of title clauses, ROMPLA clauses, debt, damages, termination for breach and remedies real and personal. It also introduces laws relating to land/real property and to personal property and to intellectual property, including Copyright, Patents, Trade Marks, Passing Off and covers current legal issues relating to the computer and internet.

CLAW 2001 **Corporations Law**

8 credit points
Mrs Mescher
Prerequisite: Any 4 full semester first year units of study including CLAW 1001. **Offered:** February. **Classes:** (3 lectures & 1 tutorial)/ week. **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 well 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 2002 **Bankruptcy and Insolvency**

8 credit points
MsWyburn
Prerequisite: CLAW 1001 and CLAW 2001. **Classes:** 3 lectures and 1 tutorial/week. **Assessment:** Assignment, quiz, classwork and exam.
This unit is concerned with the law relating to the bankruptcy of individuals and corporate insolvency. In relation to bankruptcy, the unit explores the mechanisms by which formal bankruptcy may occur (creditor and debtor petitions), the role of the trustee, creditors and the bankrupt in the administration of the bankrupt estate and the property available for distribution to creditors. It goes on to examine arrangements with creditors outside formal bankruptcy (Part IX debt agreements, Part X arrangements). In the case of corporate insolvency the area examined include receivers and other controllers, voluntary administration and deeds of company arrangement, schemes of arrangement, winding up, the liability of company officers and professional advisers and group insolvency. Also explored is the structure of the insolvency industry and proposals for reform.

CLAW 2003 **Stock Markets and Derivatives Law**

8 credit points
Mrs Mescher
Prerequisite: CLAW 1001 and CLAW 2001. **Classes:** 3 lectures/wk. **Assessment:** One 3hr exam, essay and tutorials.
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
Prerequisite: CLAW 1001. **Classes:** 3 lectures/week. **Assessment:** One 3hr exam, test, assignment.
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 2005 **Trade Practices and Consumer Law**

8 credit points
Ms Kamvounias
Prerequisite: CLAW 1001. **Classes:** (3 lectures & 1 tutorial)/week. **Assessment:** Exam, essays, classwork.
This unit is primarily concerned with the provisions in the Trade Practices Act 1974 (Cwth) dealing with restrictive trade practices, unconscionable conduct, consumer protection and liability for defective goods. Topics to be studied in depth include: anti-competitive agreements, misuse of market power, exclusive dealing, resale price maintenance, mergers and acquisitions, misleading or deceptive conduct, unfair practices, product safety and product information, conditions and warranties in consumer transactions, liability of manufacturers and importers and unconscionable conduct. Comparable state legislation is also studied

CROP 1001 **Agricultural Science 1A**

6 credit points
Dr Jacobs, Mr de Kantzow, Prof. Burgess, Assoc. Prof. Maxwell
Assumed knowledge: HSC 2 unit Chemistry or 3 unit Science. **Prohibition:** HORT1001 Horticultural Science 1A. **Offered:** February. **Classes:** (3 lec & 3 prac)/wk. **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 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
Dr Jacobs, Ms Sharma, Dr Cook, Mr deKantzow
Corequisite: CROP 1001. **Prohibition:** HORT 1002 Horticultural Science 1B. **Offered:** July. **Classes:** (3 lec & 3 prac)/wk. **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 fanning operations including solar cells, the weather and tractor safety.

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 2001 **Crop Science 2**

6 credit points
Dr Bowyer
Prerequisite: CROP 1001 and CROP 1002, orHORT 1001 and HORT1002, and BIOM 1001. **Corequisite:** AGCH 2002. **Offered:** July. **Classes:** (3 lec & 3 prac)/wk. **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
Professor Burgess
Prerequisite: CROP 1001 and CROP 1002, orHORT 1001 and HORT 1002, and BIOL 1001 and BIOL 1002 or1003, or BIOL 1201 and 1202. **Corequisite:** MICR 2101. **Offered:** July. **Classes:** (2 lec & 2 prac)/wk. **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 and Irrigation Science 3

8 credit points
Mr de Kantzow
Prohibition: HORT 2001 or CROP 3003. **Offered:** July. **Classes:** (3 lec, 2hr prac & 1 seminar)/wk. **Assessment:** One 2hr exam(50%), assignments(40%), oral presentations(10%).
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. You will use computer based simulations of biological and commercial situations to help understand them and develop management strategies for them. You will have the opportunity to unpack models which are in common use and to develop your own decision aid or simulation models so that you can gain a sound appreciation of this expanding discipline.

Irrigation farming must meet stringent environmental constraints. This course will help you understand the scientific principles of crop water management and irrigation 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)

V. Squires and P. Tow (eds) Dryland farming - a systems approach - an analysis of dryland agriculture in Australia (Sydney University Press, 1991)

J. Hardisty et all Computerised Environmental Modelling (John Wiley & Sons 1993)

CROP 3003 Agricultural Systems for Horticultural Science 3

4 credit points
Mr de Kantzow
Prohibition: CROP 3002. **Offered:** July. **Classes:** (3 lec, 1 seminar & 2 hr prac)/wk for 1 st half of semester. **Assessment:** One 2hr exam(50%), assignments(40%), oral presentations(10%).
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 recognises that computer based decision aids are widespread in science and commerce and that computer based simulations of biological and commercial situations are frequently used to help understand and develop further our ability to appreciate the systems which we observe. Students will have the opportunity to unpack models which are in common use and to develop their own decision aid or simulation models so that they gain a sound appreciation of this expanding discipline.

Economic History in the Bachelor of Agricultural Economics

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

- ECHS 2301 Making the Modern Australian Economy
- ECHS 2302 Asia-Pacific: Growth and Change
- ECHS 2303 Economic Development of Southeast Asia
- ECHS 2304 Economic Development of Modem Japan
- ECHS 2305 Strategy and Growth of Big Business
- ECHS 2306 The Managerial Firm: Evolution and Attributes
- ECHS 2307 France Since the Revolution
- ECHS 2308 East Europe: Nationalism to Transition
- ECHS 2309 Germany: Rise, Fall and Rise
- ECHS 2310 Island Pacific History Since the Mid-1800s
- ECHS 2311 Early Australian Economic History
- ECHS 2312 Topics in Modern European Social History
- ECHS 2313 The History of Modem European Expansion
- ECHS 2314 Economic & Social History of Minority Groups
- ECHS 2316 American Economic History 1865-1970
- ECHS 2317 Memphis to Megalopolis: The History of Urbanisation
- ECHS 2318 Historical Development of the Chinese Economy
- ECHS 2319 Economic History of the Mediterranean Region
- ECHS 2320 Economic Fluctuations
- ECHS 2321 Social Aspects of Industrialisation in the United States
- ECHS 2322 Comparative Industrialisation of the 'Four Tigers'
- ECHS 2323 Issues in Modem Japanese Economic History
- ECHS 2324 The Asian Firm.

Econometrics in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Department of Econometrics 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 2710 Management of Information Systems
- ECMT 2720 Management Science
- ECMT 3250 Forecasting for Economics and Business
- ECMT 3260 Sample Design and Analysis
- ECMT 3210 Statistical Modelling
- ECMT 3220 Computational Statistics
- ECMT 3230 Decision Making Under Uncertainty

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

ECMT **1010 Econometrics IA**

6 credit points

Assumed knowledge: Minimum HSC 2 unit Maths. Offered: February, July. Classes: (3 lectures, 1 tutorial & 1 practical)/week. Assessment: 3hr exam, tests, assignments.

The first of a sequence of two units that together provide an introduction to quantitative methods used in economics and related disciplines. Topics in basic statistics include: methods available for handling, analysing and interpreting data, discussion of probability distributions, an introduction to sampling theory and simple estimation problems. Mathematics of finance is also covered. A key component is the provision of instruction and experience in the use of computers and statistical software as an aid in the analysis of data.

ECMT 1020 **Econometrics 1B**

6 credit points

Corequisite: ECMT 1010. **Offered:** July. **Classes:** (3 lectures 1 tutorial & 1 practical)/week. **Assessment:** One 3hr exam, tests, assignments.

NB: Other than in exceptional circumstances, it is strongly recommended that students do not undertake 1B before attempting IA.

Builds on the work in Econometrics IA. Introduces hypothesis testing, simple and multiple regression analysis, time series analysis and decision theory. This statistical material is complemented by mathematical topics including matrices and partial differentiation. Again there is an important computing component that is integrated into this unit. Applications to economics, business and related disciplines in the social sciences are provided.

ECMT 2010 **Regression Modelling**

8 credit points

Prerequisite: ECMT 1010 and ECMT 1020. **Offered:** February. **Classes:** (3 lectures & 1 tutorial)/week. **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 econmetric software.

ECMT 2020 **Analysis of Discrete Choice Data**

8 credit points

Prerequisite: ECMT 2010. Offered: July. Classes: (3 lectures & 1 tutorial)/week. Assessment: One 3hr exam, tests, assignments.

Data that are qualitative or discrete present particular problems for data analysts. What influences an individual to work part-time rather than full-time, or use public transport rather than drive to work, or to choose one brand of detergent over another? Why do certain firms choose particular accounting procedure over another? In these examples of modelling choice data, standard linear regression models are inappropriate. This unit considers the specification, estimation and use of statistical models that are necessary to analyze such questions. These may include the logit, probit and mutinomial logit models. Special emphasis will be placed on illustrating the appropriate application of such models using case studies and data drawn from marketing, accounting, finance and economics.

ECMT 2030 **Financial Econometrics**

8 credit points

Prerequisite: ECMT 2010. Offered: July. Classes: (3 lectures & 1 tutorial)/week. 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 palced upon "hands on" 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

Prerequisite: ECMT 2010. Offered: February. Classes: (3 lectures & 1 tutorial)/week. 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

Prerequisite: ECMT 3010. Offered: July. Classes: (3 lectures & 1 tutorial)/week. 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 concemed 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.

Economics in the Bachelor of Agricultural Economics

In addition to the units of study listed after this entry, the Department 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 3011 Public Finance
- ECON 3012 Strategic Behaviour.

ECON 1001 **Introductory Microeconomics**

6 credit points

Assumed knowledge: HSC 2 unit Mathematics. **Offered:** February. **Classes:** (3 lectures & 1 tutorial)/week.

Introductory Microeconomics addresses the economic decisions of individual firms and households and how these interact in markets. It is a compulsory core course for the Bachelor of Economics degree (BEc) and is an alternative core course for the

Bachelor of Commerce degrees and for 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.

The unit begins with the introduction of a model that focuses on the question of how individuals, firms and institutions make choices concerning the allocation of scarce resources among competing uses. This is then followed by examination of a range of market structures, the concept of market power, the range of factors which determine the level of competitive pressure which individual firms experience within different market structures, and the influence of this competitive pressure on pricing and output decisions of firms,

Textbooks

Information will be provided at the beginning of the year.

ECON 1002 Introductory Macroeconomics

6 credit points

Assumed knowledge: HSC 2 unit Mathematics. **Offered:** July. **Classes:** (3 lectures & 1 tutorial)/week.

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 is an alternative core course for the Bachelor of Commerce degrees and for the Bachelor of Economics (Social Science).

Introductory Macroeconomics begins with an examination of the main factors that determine the overall levels of production and employment in the economy, including the influence of government policy and international trade. The analysis is then extended to explore the imphcations of money, interest rates and financial markets. This enables a deeper examination of inflation, unemployment and economic policy. Finally, the unit examines fundamental controversies in economic policy and theory, such as the respective roles of markets and governments, causes of and cures for inflation, the explanation of income distribution.

ECON 2001 Intermediate Microeconomics

8 credit points

Prerequisite: ECON 1001. Students who have completed first year units in the Political Economy program may transfer to ECON 2001 upon passing an examination arranged by the department. **Corequisite:** ECMT1010.6 credit points of MATH or STAT units of study may substitute for ECMT 1010. Units of study used as corequisites for ECON 2001 in place of ECMT 1010 may not be used as corequisites for ECON 2002 in place of ECMT 1020. **Offered:** February. **Classes:** (3 lectures & 1 tutorial)/week.

NB: Certain combinations of Maths/Stats may substitute for Econometrics — consult Faculty.

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. Applications of the theory are developed during the course to allow students to gain an appreciation of the way in which microeconomic theory provides insights into economic behaviour and market phenomena. This unit provides a basis for the more specialised options that comprise third year economics.

Textbooks

Information will be provided at the beginning of the year.

ECON 2002 Intermediate Macroeconomics

8 credit points

Prerequisite: ECON 1002 Students who have completed first year units in the Political Economy program may transfer to ECON 2002 upon passing an examination arranged by the department. **Corequisite:** ECMT 1020.6 credit points of MATH or STAT units of study may substitute for ECMT 1020. Units of study used as corequisites for ECON 2002 in place of ECMT 1020 may not be used as corequisites for ECON 2001 in place of ECMT 1010. **Offered:** July. **Classes:** (3 lectures & 1 tutorial)/week.

NB: Certain combinations of Maths/Stats may substitute for Econometrics - consult Faculty.

This unit of study develops models of the goods, money and labour markets, and in this context, 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 addressed, so introducing questions of both theory and policy. The lectures include an examination of Australian economic policy in relation to balance of payments performance and foreign debt. 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.

ENTO1001 Agricultural Entomology 1

4 credit points

Assoc. Prof. Rose

Offered: July. **Classes:** (2 lec & 2 prac)/wk. **Assessment:** One 2hr exam, classwork.

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

Prerequisite: ENTO 1001 or Agricultural Science **I.Corequisite:** ENTO 4002. **Offered:** February.

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 List: This 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

Prerequisite: ENTO 1001 or Agricultural Science 1. **Corequisite:** ENTO 4001. **Offered:** July.

See ENTO 4001 Agricultural Entomology 4A

Textbooks

See Agricultural Entomology 4A

ENVI1001 **Global Geology**

6 credit points

Professor Davies

Offered: February. **Classes:** 3 lec & prac/tut/wk. **Assessment:** One 3hr 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
Assoc. Prof. D. Dragovich
Offered: July. **Classes:** 3 lec & prac/tut/wk. **Assessment:** One 3hr 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 of study also considers the soil environment including physical, chemical and biological aspects. Students will learn how to integrate information from related disciplines to understand relationships between earth sciences and solutions to environmental problems.

ENVI 3002 **Environmental Assessment**

12 credit points
Prerequisite: ENVI 2003, 2004, 2103 and 2104 (From year 2001: ENVI 2001 and 2002). Offered: July. Classes: (8 lec or tut)wk; 70hr of prac and field-units of study. Assessment: Continual assessment throughout the semester by essay, report and prac assignments.
NB: This unit of study can only be taken by students enrolled in the BSc(Environmental) and the BLWSc degrees.
For students commencing Senior year in 2000 only
Environmental Science 3002 Core Module, 4 credit points
Classes: (4 lec or tuf)/wk; 28hr of prac and field-units of study

Assessment: one 1.5hr exam and 2 prac assignments each semester; one major environmental report

The Core section in Senior Environmental Science build on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities. Topics in the 3B Core module include introductions to environmental economics, and issues concerning environmental impact assessment. Emphasis will be on practical work in field-units of study to learn how to interpret and synthesise environmental data, to make decisions and recommendations about possible environmental management and how to use diverse sources of specialist information for large scale problem-solving.

Environmental Science 3002 Option Modules
The following list of Options modules are available for inclusion within the ENVI 3002. This list is subject to change according to the availability of resources from within the contributing Departments. No student may take Option modules so as to gain more than 12 credit points in any one relevant discipline per year, so careful consideration must be given towards both ENVI 3001 and 3002 subjects at the beginning of First Semester. Please see the Chair of the Program Committee for Environmental Science for an up-to-date listing.
Biology

- Ecology (8 credit points) (Taken as part of BIOL 3202)

Divided into field course (4 credit points) and lectures (4 credit points), running in 2nd semester. The field course (week before semester starts) is compulsory for the lecture series.

- Terrestrial Ecology (4 credit points) (Taken as part of BIOL 3202)

Terrestrial ecology considers the biology of organisms in terrestrial ecosystems and analyses their distribution and abundance. This module investigates the relationships between ecology and the management of populations and communities for conservation and exploitation.

- Plant Ecology (4 credit points) (Taken as part of BIOL 3202)

Plant ecology examines the ecological processes that produce complex interactions within plant populations. The role of genetics, demography and populations structure in the management and conservation of plants will be considered.

Chemistry

- Chemistry 3B (Environmental) (CHEM 3602,4 credit points)

Consists of 2 hours of lectures and 2 hours of practical each week, covering the subjects Chemistry Laboratory Practices, Marine Chemistry, Mineral Chemistry and Atmospheric Photochemistry. Assessment is by exam and practical.

Geography

- Coastal Zone Management (6 credit points) (Taken as part of GEOG3102)
- Geographical Information Systems (6 credit points) (Taken as part of GEOG 3102)
- Rock Weathering (6 credit points) (Taken as part of GEOG 3002)
- Agricultural Chemistry & Soil Science
- Advanced Soil Chemistry (6-credit points). (Taken as part of SOIL 3002)

Geology and Geophysics

- Environmental Geophysics (GEOP 3005, 4 credit points)
- Chemical Processes in the Oceans (MARS 3001/MS8, 6 credit points)
- Marine Geology and Palaeoclimates (MARS 3001/MS9, 6 credit points)
- Paleobiology (GEOL 3004,4 Credit points)

Microbiology

- Microbiology (2 x 4 credit points, one each semester) (Taken as part of MICR 2001 and 3002)

These 2 modules must be taken together. They cannot be taken individually.

The 1st Semester module would cover: an introduction to microbiology; basic techniques (microscopy, staining, cultivation of bacteria); sterilization and disinfection; prokaryotes; eukaryotes; and, microbial growth, with 3 hours of lectures, 1 of tutorials and 4 of practical each week for the first 7 weeks of semester.

In second semester, the module would consist of 1 lecture and 3 hours of practical each week for the whole semester, covering environmental aspects of plant, soil and water microbiology.

Students commencing Senior year from 2001
ENVI 3002 covers topics in environmental economics and risk assessment, as well as issues concerning environmental impact assessment. There is also a section concerning the logical structure of environmental sampling, including the nature of variables, univariate and multivariate measures, correlation of environmental variables and interpretation of data. This introduces the theory of sampling design for measurements at different scales of biological systems, statistical analysis of data and the interpretation of magnitude and scale of environmental disturbances.

ENVI 3001 Environmental Law and Planning

12 credit points
Prerequisite: ENVI 2003, 2004, 2103 and 2104 (From year 2001: ENVI 2001 and 2002). **Offered:** February. **Classes:** (8 lec or tut)wk; 70hr of prac and field-units of study. **Assessment:** Continual assessment throughout the semester by essay, report and prac assignments.

NB: This unit of study can only be taken by students enrolled in the BSc(Environmental).

For students commencing Senior year in 2000 only
Environmental Science 3001 Core Module, 4 credit points
Classes: (4 lec or tut)/wk; 28hr of prac and field-units of study. Assessment: one 1.5hr exam and 2 prac assignments each semester; one major environmental report.

The Core section in Senior Environmental Science build on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other

aspects of environmental problem-solving and professional responsibilities. Topics in the 3A Core module include introductions to environmental ethics, law, and issues of planning, regulation and management for the built and natural environments.

Environmental Science 3001 Option Modules

The following list of Options modules are available for inclusion within the ENVI 3001. The modules are of varying durations and credit weightings, as detailed below. This list is subject to change according to the availability of resources from within the contributing Departments. No student may take Option modules so as to gain more than 12 credit points in any one relevant discipline per year, so careful consideration must be given towards both ENVI 3001 and 3002 subjects at the beginning of First Semester. Please see the Chair of the Program Committee for Environmental Science for an up-to-date listing.

Biology

- Ecophysiology (4 credit points) {Taken as part of School of Biology Honours program}

Ecophysiology is a field course, held over 3 days, that covers general physiological interactions between organisms and their environment.

Chemistry

- Chemistry 3 A (Environmental) (CHEM 3601,4 credit points)

Consists of 2 hours of lectures and 2 hours of practical each week, covering the subjects Spectroscopic Identification of Organic Compounds, Instrumental Methods in Analytical Chemistry, Aquatic Chemistry and Radiation Chemistry. Assessment is by exam and practical.

Physics

- Energy and the Environment (PHYS 3600, 4 credit points)

Geography

- Ancient Environments (6 credit points) {Taken as part of GEOG3101}
- Environmental Fluvial Geomorphology (6 credit points) {Taken as part of GEOG 3101}

Agricultural Chemistry & Soil Science

- Environmental Soil Physics (6-credit points). {Taken as part of SOIL 3001}
- Pedology (6-credit points). {Taken as part of SOIL 3001}
- Introductory Environmental Plant & Soil Chemistry (AGCH 3012,4-credit points)

Geology and Geophysics

- Physical Sedimentology (MARS 3001/MS3, 6 credit points)
- Geodynamics (GEOP 3002, 4 credit points)

Microbiology

- Microbiology (2 x 4 credit points - one each semester) {Taken as part of MICR 2001 and 3002}

These 2 modules must be taken together. They cannot be taken individually.

The 1st Semester module covers: an introduction to microbiology; basic techniques (microscopy, staining, cultivation of bacteria); sterilization and disinfection; prokaryotes; eukaryotes; and, microbial growth, with 3 hours of lectures, 1 of tutorials and 4 of practical each week for the first 7 weeks of semester.

In second semester, the module consists of 1 lecture and 3 hours of practical each week for the whole semester, covering environmental aspects of plant, soil and water microbiology.

Students commencing Senior year from 2001

ENVI 3001 covers topics and issues in environmental ethics, law, planning, regulation and management for the built and natural environments, and energy production and alternate processes. There is also a field school to outback New South Wales, travelling to areas such as the Namoi Valley and the Macquarie Marshes which is held in the week prior to the start of semester, and is designed to investigate the impact of irrigation-based agricultural practices on the environment. An alternative is available to those students unable to attend this 7-day excursion.

ENVI 4803 Environmental Law

4 credit points

Offered: February.

This is an overview unit of study which looks at a number of environmental issues at various levels of analysis, policy making, implementation of policy and dispute resolution. It will provide a broad background of the political and economic issues as they related to the legal issues involved plus a general coverage of all laws in Australia pertaining to environmental matters. This unit of study involves lecture material and an essay on policy issues.

FARM 4001 Farming Systems 4A

24 credit points

Mr de Kantzow

Prerequisite: AGEC 2003 or AGEC 3001. **Corequisite:** AGRO 3001. **Offered:** February.

This is an interdisciplinary program offered jointly by the Department of Agricultural Economics and the Department of Crop Sciences. It is designed for students with a general training in agricultural science who seek to understand farming systems and their managerial aspects within the wider agribusiness environment. Students will complete a minimum of 48 credit points including a project.

Core units of study:

Agronomy 3 (if not already completed) (8 credit points)

Crop Agronomy & Sustainable Management (8 credit points)

Crop and Pasture Physiology (4 credit points)

Pasture Agronomy (4 credit points)

Either

Introductory Land and Water Economics (4 credit points)

or

Natural Resource Economics 4 (8 credit points)

Production Economics 2 (if not already completed) (8 credit points)

Project (8 credit points)

plus credit points from the following units:

Accounting IA and 1B (12 credit points), or

Financial Accounting Concepts and Management Accounting Concepts (12 credit points)

Advanced Soil Chemistry (6 credit points)

Agribusiness Management 3 (8 credit points)

Agricultural and Resource Policy 3 (8 credit points)

Agricultural Systems and Irrigation Science 3(8 credit points)

Applied International Trade 4 (8 credit points)

Applied Marketing 4 (8 credit points)

Plant Disease 3 (8 credit points)

Soil Science 3 (8 credit points)

and other units of study approved by the Head of Department concerned, up to 8 credit points.

Project (8 credit points)

The project will involve an evaluation of an agribusiness/farming systems/farm management proposal and results in a 10,000-word report. Students will be assisted in the selection of a suitable project.

To pass the year, students must perform satisfactorily in the project, in subjects of an economics nature and in subjects of a science nature.

Introductory Land and Water Economics

4 credit points. Coordinator: Dr Godden. Offered: March. Assessment: one 1.5hrexam, assignments.

An overview is provided of economic analysis of natural resources in the context of making choices about resource use. Initial lectures sketch the need for economic principles in analysing resource use, and develop basic economic principles for evaluating production and consumption of commodities. Property rights and time are emphasised as key areas where basic economic principles require modifying in a resources context: these principles are used to develop tools of economic analysis in benefit-cost analysis; economics of pollution; and optimising use of natural resources over time. Six particular natural resource problems are examined: agricultural and urban water supply; blue-green algae; intractable waste; sustainable development; population and food supply; and the enhanced greenhouse effect.

Unit of study and component descriptions
For those of an economic nature, see under Agricultural Economics. For those of a scientific nature, see under Agronomy 4, Soil Science 4, or the specific unit of study or component stated above.

FARM 4002 **Farming Systems 4B**
24 credit points
Prerequisite: AGEC 2003 or AGEC 3001. **Corequisite:** FARM 4001, AGRO 3001. **Offered:** July.
See FARM 4001 Farming Systems 4A.

Finance in the Bachelor of Agricultural Economics

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

FINC2001 **Corporate Finance I**
8 credit points
Prerequisite: ECON 1001 and ECON 1002 and ECMT1010 and ECMT 1020 and ACCT 1001 (or ACCT1003). Offered: February. Classes: 2hrs lectures, 1 hr workshop & 1 hr tutorial/week. Assessment: One 3hr exam, assignments.
NB: 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.

FI NC 2002 **Corporate Finance II**
8 credit points
Prerequisite: As for FINC 2001. Corequisite: FINC 2001. Offered: July. Classes: 2hrs lectures, 1 hr workshop & 1 hr tutorial/week. Assessment: One 3hr exam, assignments.
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 microstracture' is introduced and a number of issues in corporate governance and takeovers are examined.

FINC 2004 **Introductory Mathematical Finance**
8 credit points
Prerequisite: ECON 1001 and ECON 1002 and ECMT 1010 and ECMT 1020 and ACCT 1001 (or ACCT 1003). **Corequisite:** FINC 2001. **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. **Offered:** July. **Classes:** (2 hrs lectures + 1 tutorial)/week plus additional workshops as required. **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
Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. Offered: July. Classes: (2 hrs lectures + 1 tutorial)/week. 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
Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004), and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Offered:** February. **Classes:** (2 hrs lectures and 1 tutorial)/week; one workshop session (not every week). **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.

FI NC 3003 **Corporate Control**
8 credit points
Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. Offered: February. Classes: (2 hrs lectures and 1 tutorial)/week plus additional workshops as required. 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 Securities Markets**

8 credit points
Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004) andECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Offered:** July. **Classes:** (2 hrs lectures + 1 tutorial)/week. **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
Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004); and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Offered:** July. **Classes:** (2 hrs lectures and 1 tutorial)/week, one workshop session (not every week). **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 3006 **Investments and Portfolio Management**

8 credit points
Prerequisite: FINC 2001 & (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. **Offered:** February. **Classes:** (2hrs lectures + 1 tutorial) /week. **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 modem 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 probablility concepts will be reviewed at the beginning to ensure that all students have adequate understanding. Although there 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
Prerequisite: FINC 2001 and (FINC 2002 or FINC 2004) and ECON 2001 and ECON 2002 or ECON 2901 and ECON 2902. Offered: February. Classes: (2hrs lectures + 1 tutorial) /week. 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 - 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, Dr Stoddard, Assoc. Prof. Moran, Assoc. Prof. Nicholas
Prerequisite: BIOL 1201 and BIOL 1202 or BIOL 1001 and BIOL 1002, BIOM 1001. Offered: July. Classes: (3 lec, 1 tut & 2 prac)/wk. 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
Prerequisite: BIOM 2001, GENE 2001. Offered: February.

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, immunogenet-

ics, 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
Prerequisite: BIOM 2001, GENE 2001. **Corequisite:** GENE 4001.
Offered: July.
See Agricultural Genetics 4A.

GEOG 2001 Processes in Geomorphology

8 credit points
Associate Professor D Dragovich
Prerequisite: GEOG 1001 or ENV11002. **Prohibition:** Other Information: A candidate who has completed 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken GEOG 1001 or 1002 may apply under Section 1 (4) for permission to enrol in any Intermediate Geography unit of study. The School of Geosciences is not normally prepared to support applications under Section 1 (4) to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed four Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study. **Offered:** February. Classes: 3 lec & 5 prac or field/wk. **Assessment:** One 3hr exam or 1500w essay or prac papers.

Geomorphology stream: This unit of study is concerned with the geomorphology of global environments, as mega-landforms and the processes that shape mem. 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 & Mr G Doyle
Prerequisite: GEOG 1001 or ENV11002. **Prohibition:** Other Information: As for GEOG 2001. **Offered:** July. **Classes:** 3 lec & 5 prac or field/wk. **Assessment:** One 3hr exam, 1500w essay or prac reports.

Physical Geography stream: This unit of study focuses not on global, but meso- and micro-scales on two of the major morpho-stratigraphic 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 2302 Fluvial Geomorphology and Hydrology

NB: Not offered in 2000.

Geography units in the Bachelor of Agricultural Economics

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 Department. 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 1920's. 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 Department.

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

Departmental 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 Junior units in the Bachelor of Agricultural Economics

The Department offers two junior units of study:
- GEOG 1001 Physical Geography
- GEOG 1002 Environmental and Human Geography.

Geography Intermediate units in the Bachelor of Agricultural Economics

The Department offers six Intermediate units of study in 3 streams.

Each unit consists of three lectures and the equivalent of five 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 excursions associated with each unit of study which are held within the semester. Some units hold two or three such excursions.

Geomorphology
- GEOG 2001 Processes in Geomorphology
- GEOG 2002 Fluvial and Coastal Environments

Environmental
- GEOG 2101 Environmental Change and Human Response
- GEOG 2102 Resource and Environmental Management

Human
- GEOG 2201 Social and Urban Geography
- GEOG 2202 Economic and Political Geography.

Geography Senior units in the Bachelor of Agricultural Economics

The Department 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.
- 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 3201 Australia in its Global Context.

Government in the Bachelor of Agricultural Economics

In addition to the Level 1000 units which follow this entry, the Department of Government 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 2102 State Politics in Australia
- GOVT 2103 Environmental Politics and Policy in Australia
- GOVT 2104 Political Party System in Australia
- GOVT 2105 Religion in Australian Politics
- GOVT 2106 Australian Foreign and Defence Policy
- GOVT 2107 Researching Australian Political Behaviour
- GOVT 2108 Spirituality and Politics in Australia
- GOVT 2201 Economic Relations in International Politics
- GOVT 2202 The Superpowers and After
- GOVT 2203 International Communism and After
- GOVT 2204 Globalisation and Politics
- GOVT 2207 Issues in International Politics
- GOVT 2208 Environmental Politics in the Asia-Pacific
- GOVT 2209 Theories of War and Peace
- GOVT 2301 Social Change and Politics
- GOVT 2302 Socialist and Labour Politics
- GOVT 2303 Media Politics
- GOVT 2305 Social Movements, Politics and Identity
- GOVT 2306 Gender and the State
- GOVT 2307 State and Political Economy
- GOVT 2401 Japanese Politics
- GOVT 2402 Government and Politics of Modern China
- GOVT 2403 Development Politics
- GOVT 2404 European Politics and Transition
- GOVT 2405 American Politics and Foreign Policy
- GOVT 2406 Reform, Revolution and Post-Communism
- GOVT 2407 Revolution, Nationalism and Modernity
- GOVT 2409 Authoritarian Politics
- GOVT 2410 States and Markets in the International System
- GOVT 2411 Capitalism and Democracy in East Asia
- GOVT 2412 Ethnic Conflict in Comparative Pespective
- GOVT 2414 Federalism
- GOVT 2415 Asia-Pacific Region and Japan
- GOVT 2416 Social and Economic Policies in East Asia
- GOVT 2417 Popular Culture and Politics
- GOVT 2501 Public Policy and Administration
- GOVT 2502 Policy Analysis
- GOVT 2503 Citizenship, Work and Welfare
- GOVT 2504 Government and Business
- GOVT 2506 Executive Politics
- GOVT 2507 Public Sector Management
- GOVT 2601 Classical Political Theory
- GOVT 2602 Political Theory: Early Modern
- GOVT 2605 Ethics and Politics
- GOVT 2606 Modernity and Politics
- GOVT 2607 Literature and Politics
- GOVT 2608 Utopia in Theory and Practice
- GOVT 2609 Republicanism.

GOVT 1101 Australian Politics

6 credit points

Offered: February, July. 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 1104 Power in Society

6 credit points

Classes: (2 lectures & 1 tutorial)/week.

NB: Not offered in 2000.

This unit provides an introduction to the study of politics, through a focus on the key organising principle of political science: power. Different ways in which power is theorised and structured are considered. In particular it considers the way power operates in a liberal democratic state (such as Australia) and examines some contemporary critiques of power and the state (for example feminism and the New Right). An explicit effort is made throughout to combine the study of key political ideas and concepts with practical examples which draw primarily on Australian political institutions and processes.

GOVT 1202 **World Politics**

6 credit points

Offered: February, July. 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

Offered: July. Classes: (2 lectures & 1 tutorial)/week.

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 (e.g. environmental movements, international environment agencies), the link between scientific knowledge and political action, international equity and environmental problems (the North/South debate), etc.

GOVT 1403 Development in World Politics

6 credit points

Classes: (2 lectures & 1 tutorial)/week.

NB: Not offered in 2000.

This unit compares the main varieties of political organisation in the contemporary world with the aim of understanding their evolution and impact on social and economic development. Drawing on the developmental experience of Western Europe, Asia, and Latin America, the unit will try to shed light on the following kinds of questions: Why do we live in nation-states and how did they become the dominant form of political organisation? Why did some countries end up with authoritarian regimes while others evolved as democracies? What difference does democracy make for contemporary social and economic development? Why have some states succeeded in developing their economies, whilst others appear trapped in conditions of poverty?

GOVT 1405 Comparative Perspectives on Australian Politics

6 credit points

Classes: (2 lectures & 1 tutorial)/week.

NB: Not offered in 2000.

This unit examines Australian politics against the background of general writings on comparative democratic politics, offering both general comparisons with the other seventeen advanced industrial states which have been liberal democracies continuously for the last fifty years, as well as specific bilateral comparison. The unit examines the central institutions of liberal democ-

racies - parliaments, parties, the electoral system, the mass media - and how these interact with the pursuit of major conflicts and the conduct of policy making.

GOVT 1406 Change in Modern World Politics

6 credit points

Offered: February. Classes: (2 lectures & 1 tutorial)/week.

The last two decades of the twentieth century have seen a wave of democratisation sweep the world. In Latin America, Southern and Eastern Europe, East Asia and Southern Africa, new regimes have replaced authoritarian governments and sought to build democratic systems. But such changes of regime have not been a feature only of this period; regime change has been common throughout history. This unit will focus upon the politics of regime change. It will analyse the ways in which changes of regime occur, including coup d'etat, revolution, and the more gradual process of evolution. It will study the types of actors involved and the social and economic forces which assist (or hinder) this process. It will also look at the conditions facilitating the consolidation of new regimes. Examples will be taken from various parts of the world to provide a comparative perspective.

GOVT 1410 East Asian Comparative Politics and Economic Change

6 credit points

Classes: (2 lectures & 1 tutorial)/week.

NB: Not offered in 2000.

This unit analyses political processes and institutions in major countries in the East Asian region that apparently share rapid economic development. Are mere identifiable political models that underpin rapid economic growth and what have been the political consequences of this economic change? While emphasising key conceptual issues in comparative politics, the unit will expose basic social, economic and political characteristics of countries in the region. Similarities and dissimilarities will be drawn between Japan, the first wave of new industrialising countries (NICs), particularly South Korea and Taiwan, and some of the rapidly changing countries of Southeast Asia.

GOVT 1609 Ethnicity, Nationalism and Citizenship

6 credit points

Offered: July. Classes: (2 lectures & 1 tutorial)/week.

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 multiethnic 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.

GOVT 1611 Democratic Theory and Practice

6 credit points

Classes: (2 lectures & 1 tutorial)/week.

NB: Not offered in 2000.

"Hands up all those in favour!" Voting is the all-purpose method of solving problems. Or is it? Should a vote decide capital punishment, environmental protection, Asian immigration, the age of consent, and so on? Cyber space brings us a step nearer the dream of direct democracy, where every public decision could be decided by the vote of every citizen. Is that a desirable goal, or not? What can voting decide, and what can it not? Why is the majority better than unanimity? Whose vote should count? How do courts and law relate to the electoral institutions of political democracy?

HORT1001 Horticultural Science 1A

6 credit points

Dr Jacobs, Mr de Kantzow, Prof. Burgess, Assoc. Prof. Maxwell, Dr McConchie

Assumed knowledge: HSC 2 unit Chemistry or 3 unit Science. **Prohibition:** CROP 1001. **Offered:** February. **Classes:** (3 lec & 3 prac)/wk, excursion. **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 practical sessions allow 'hands-on' experience with the equipment used by horticulturalists and provide an overview of horticultural industries in the Sydney region.

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)

HORT1002 Horticultural Science 1B

6 credit points

Dr Jacobs, Ms Sharma, Dr Cook, Mr deKantzow

Corequisite: HORT 1001. **Prohibition:** CROP 1002. **Offered:** July. **Classes:** (3 lec & 3 prac)/wk. **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 farming operations including solar cells, the weather and tractor safety.

Textbooks

See HORT 1001 Horticultural Science IA

HORT 2001 Horticultural Science 2

6 credit points

Dr McConchie, Dr Goodwin, Dr Sutton

Prerequisite: HORT 1001 & HORT 1002 or CROP 1001 and CROP 1002. Corequisite: CROP 2001. Offered: July. Classes: (3 lec & 3 prac)/wk. Assessment: One 3hr exam, assignments, prac book.

The unit of study covers topics on plant propagation, horticultural production systems and irrigation. Concepts of asexual and sexual plant propagation are presented in combination with practical sessions. Topics include propagation by cuttings, grafting, budding, tissue culture and specialised organs. 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, F.T. 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 Goodwin
Prerequisite: CROP 2001 or HORT 2001 or AGRO 2002. **Offered:** February. Classes: (3 lec, 2 workshops, 1 prac & 2 excursions)/wk (including 1 two and a half day excursion). **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, 1994)

HORT 3002 **Flower & Nursery Crops 3**

4 credit points
Dr Goodwin
Prerequisite: CROP 2001 or HORT 2001 or AGRO 2002. **Offered:** July. Classes: (2 lec, 2 prac)/wk. **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.

HORT 3003 **Postharvest Biology and Technology 3**

4 credit points
Dr R McConchie
Prerequisite: CROP 2001 or HORT 2001 or AGRO 2002. **Offered:** July. Classes: (1 lec, 1 tut,& 2 prac)/wk. **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
Prerequisite: HORT 3001. **Offered:** February.

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
(12 credit points)

Students attend a series of workshops, seminars and excursions designed to provide them with abroad 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
(12 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.

HORT 4002 **Horticultural Science 4B**

24 credit points
Prerequisite: HORT 3001. **Offered:** July.

See HORT 4001 Horticultural Science 4A.

LWSC 1001 **Land and Water Science 1A**

6 credit points
Offered: February. **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
Corequisite: (LWSC 1001) Land and Water Science 1 A. **Offered:** July. **Assessment:** One 2 hr exam, assignments, weekly class practical tests.

This unit of study develops the theme of environmental sustainability 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 2A**

2 credit points
Offered: February. Classes: 4hr lec, 6 hr tut, 3 hr sem, 40 hr(5 day) field program. **Assessment:** Written report, oral presentation.
NB: Not offered in 2000.

The unit comprises theoretical and practical studies to facilitate students understanding of the scientific principles and processes that should be considered in land and water studies. Lectures, seminars, tutorials and field trips will be used to help students examine issues related to water storage and utilisation, water pollution, land degradation, environmental policy and planning, socio-economic needs, ecosystem demand within the context of sustainable land and water resource management.

LWSC 2002 **Land and Water Science 2B**
2 credit points
Offered: July.
NB: Not offered in 2000.
See LWSC 2001.

LWSC 3001 **Hydrology and Catchment Management**
4 credit points
Offered: July.
*NB: Not offered **in** 2000.*

LWSC 4001 **Planning and Communicating Policy**
4 credit points
Offered: February.
NB: Not offered in 2000.

LWSC 4002 **Project/Case Study**
24 credit points
Offered: July.
NB: Not offered in 2000.

MATH 1001 **Differential Calculus**
3 credit points
Assumed knowledge: HSC 3-unit Mathematics. **Prohibition:** May not be counted with MATH 1901 or 1011. **Offered:** February. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2 hour examination, assignments, quizzes and practical work.
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 functions of a single variable, limits and continuity, vector functions and functions of two variables. Differential calculus is extended to functions of two variables. Integral calculus concentrates on methods of integration.

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
Assumed knowledge: HSC 3-unit Mathematics. **Prohibition:** May not be counted with MATH 1902 or 1012. **Offered:** February. **Classes: 2** lec **& 1** tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
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, complex numbers and 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
Assumed knowledge: HSC 4-unit Mathematics or MATH 1001. **Prohibition:** May not be counted with MATH 1903 or 1013. **Offered: July. Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
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. Infinite series are introduced with emphasis on Taylor series. 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
Assumed knowledge: HSC 2-unit Mathematics. **Prohibition:** May not be counted with MATH 1905 or 1015. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
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 first introduction to data analysis, probability and 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 2003 **Theoretical Microbiology A**
4 credit points
Mrs Dalins (Coordinator), Dr Carter, Prof Reeves, Dr New, Dr Duxbury
Qualifying: BIOL 1002 or 1902 or 1003 or 1903. **Prerequisite:** CHEM 1102 or 1902 or 1904. **Corequisite:** BIOL 1001 or 1901 and CHEM 1101 or 1901 or 1903 and MATH (1001 or 1011 or 1901) and (1005 or 1015 or 1905). **Prohibition:** May not be counted with MICR 2001 or 2901. **Offered:** February. **Classes:** 3 lec/wk. **Assessment:** One 3hr exam.
This unit of study is suitable for students who are majoring in other aspects of biology and wish to acquire a broad background knowledge in microbiology. Students attend the same lectures as those enrolled in Microbiology 2001. There is no practical or tutorial component.
Textbooks
As for MICR 2001

MICR 2101 **Agricultural Microbiology 2**
6 credit points
Dr New.Dr Carter, Mrs Dalins, Dr Duxbury, Prof. Reeves
Prerequisite: First year Biology, First year Chemistry or Chemistry 1 Advanced. **Offered:** February. **Classes:** (3 lec, 2 prac & 1 tut)/wk. **Assessment:** One 3hr 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; bacterial genetics; microbiology of the natural environment including the soil, nutrient cycling and nitrogen fixation.

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

M1CR 3102 **Agricultural Microbiology 3**
8 credit points
Dr New, Dr Carter, Mrs Dalins, Dr Duxbury, Prof. Reeves
Prerequisite: MICR 2101. **Offered:** July. **Classes:** (3 lec, 4 prac & 1 tut)/wk. **Assessment:** One 3hr 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 Agricultural Microbiology 2

MICR 4101 **Agricultural Microbiology 4A**
24 credit points
Dr New
Prerequisite: MICR 3102. **Corequisite:** MICR 4102. **Offered:** February. **Classes:** (3 lec, 6 prac, 3 other activities)wk. **Assessment:** One 1.5 h & one 2 hr theory exam, essay, 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
Prerequisite: MICR 3102. Corequisite: MICR 4101. Offered: July. Classes: (3 lec, 6 prac, 3 other activities)wk. 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 Department of Marketing in the Faculty of Economics and Business follow this entry.

MKTG 2001 **Marketing Principles**
8 credit points
Prerequisite: ECON 1001, ECON 1002, ECMT 1010 and ECMT 1020. **Corequisite:** ACCT 1001 or ACCT 1003. **Offered:** February. **Classes:** (1 lec & 1 tut)/wk. **Assessment:** Two 2hr exams (or equivalent), assignments.

NB: Marketing units of study commence in secondyear, but prerequisites must be completed in first year.

Introduction to the terminology and functions of marketing in modem 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
Prerequisite: MKTG 2001**. Corequisite:** MKTG 2003. **Offered:** July. **Classes:** (1 lec & 1 tut)/wk. **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
Prerequisite: MKTG 2001. **Corequisite:** MKTG 2002. **Offered:** July. **Classes:** (1 lec & 1 tut)/wk. **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
Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003 and ECON 2001. Offered: February. Classes: (1 lec & 1 tut)/wk. 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
Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003 and MKTG 3001 and ECON 2001. Offered: July. Classes: (1 lec & 1 tut)/wk. 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
Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003 and ECON 2001. **Corequisite:** MKTG 3001. **Offered:** February. **Classes:** 1 lec/wk. **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
Prerequisite: MKTG 2001 and MKTG 2002 and MKTG 2003 and MKTG 3001 and ECON 2001. Offered: July. Classes: (1 lec & 1 tut)/wk. 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.

PPAT3002 **Plant Disease 3**

4 credit points
Dr Bowyer
Prerequisite: CROP 2001, CROP 2002, GENE 2001. **Offered:** July. **Classes:** (2 lec & 2 prac)/wk. **Assessment:** One 2hr theory exam, one 1 hr prac exam, assignment, 3 short written quizzes.
This unit of study provides an introduction to the common types of plant disease which limit agricultural and horticultural production and to the principles of plant pathology. Topics include: symptoms and recognition of diseases, and the procedures for establishing the cause of disease; biology of the major groups of pathogens (fungi, bacteria, viruses, nematodes) and associated diseases; abiotic causes of diseases; distinction between life cycles and disease cycles of pathogens; epidemiology of diseases; disease resistance and parasitic specialisation from genetic and physiological perspectives; breeding for disease resistance; use of biotechnology in disease control.

Laboratory work includes the study of symptoms caused by the major groups of pathogens, methods for isolating pathogens from plants, techniques for inoculating plants with pathogenic fungi, bacteria and viruses, serological techniques in plant pathology and genetics of host resistance.
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
Prerequisite: Plant Pathology 3 or PPAT 3001. **Offered:** February.
A full-year specialisation comprising the following units of study plus an additional 6 credit points selected to the satisfaction of the Head of Department. This may be varied by substituting Molecular Genetics and Recombinant DNA Technology (12 credit points) for any two of the 6 credit point units with the approval of the Head of Department.
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 farming.
Bacteriology and Virology
6 credit points.

A series of lectures and associated practical work on the plant-pathogenic bacteria and viruses and their interactions with plants. Includes symptoms of disease, the purification, transmission, characterisation, detection, ecology and taxonomy of plant viruses, and principles of control. The practical work emphasises advanced analytical techniques in virology.
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)
D.M. Griffin Ecology of Soil Fungi (Chapman & Hall, 1972)
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
Prerequisite: Plant Pathology 3 or PPAT 3001. **Offered:** July.
See Plant Pathology 4A.
Textbooks
See Plant Pathology 4A

RSIS 3001 **Rural Spatial Information Systems 3**

4 credit points
Prof McBratney, Dr Odeh
Prerequisite: SOIL 2003, BIOM 2001 or BIOM 2002. **Offered:** February. **Classes:** Easter break, four 8 hr days plus one 3 day field excursion. **Assessment:** One 3 hr 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, e.g., Bureau of Rural Sciences, CSIRO Land & Water.

- 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
Offered: February. **Classes:** (3 lec & 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 Modern Agriculture (Sydney U.P., 1988)
D.L. Rowell, Soil Science: Methods 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 11th edn (Wiley, 1988)

SOIL 3003 **Soil Science 3**

8 credit points
Dr Singh, Dr Cattle, Prof. McBratney
Prerequisite: SOIL 2003. **Offered:** July. **Classes:** (4 lec & 3hr prac)/wk; 5 days in the field in last or 2nd last week mid-year break.
Assessment: One 3hrexam, 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
Prerequisite: SOIL 3003. **Offered:** February.
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 at least three of the following four modules: Advanced Soil Chemistry, Advanced Field and Laboratory Soil Physics, Advanced Methods of Soil Analysis and Advanced Pedology, and any other 6-credit point modules approved by the Head of Department.

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 Austrlian Soil Classification (CSIRO Publishing 1996)

Advanced Methods of Soil Analysis

6 credit points. Prof McBratney, Dr Singh, Dr Cattle Offered: March. Classes: (3 lec, 1 tut & 8hrprac)/7wk (2nd half). Assessment: one 3hr exam, lab report, problem sets, essay.

Approaches to scientific investigation and methods of literature survey followed by tutorial on computer search techniques.

Physical. Particle Size Analysis (PSA) of clay fraction and fractionation by centrifugation techniques, specific surface area measurements by BET Thermocouple methods for field measurements of moisture. Thermal conductivity methods for soil moisture content, gamma and neutron probe methods for field measurements of moisture content and bulk density and time-domain reflectometry.

Physico-chemical. Measurement of oxidation-reduction status, 02 diffusion rate and 02, C02 concentrations in soil, selective ion-electrodes for measurements of ion activities in soil solution.

Geotechnical. Mechanical measurements of soil properties including Atterberg limits, unconfined compression, penetrometer, Proctor and compaction, torsion shear box, dynamometer, rupture-test and drop shatter test, sampling and testing procedures for determining physical properties of swelling soils.

Soil structural. Soil structure and stability tests in relation to aggregate size and soil micro-aggregates. Fractionation of soil organic matter and determination of principal functional groups COOH, OH involved in CEC and complexation of heavy metals.

Reference books

A. Klute (ed.) Method of Soil Analysis. Part 1. Physical and Mineralogical Methods 2nd edn (American Society of Agronomy Monograph No. 9, Madison, Wisconsin, 1986)

J. Loveday (ed.) Methods of Analysis for Irrigated Soils Technical Communication No. 54 (Commonwealth Agricultural Bureaux, 1974)

A.L. Page et al. (eds) Methods of Soil Analysis. Part 2. Chemical and Microbiological Methods 2nd edn (American Society of Agronomy Monograph No. 9, Madison, Wisconsin, 1982)

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 hardward 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 widiin-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 vurves 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

Corequisite: SOIL 4002. **Offered:** July.

Research Project

See **SOUL 4002** Soil Science 4A.

CHAPTER 4

Postgraduate course requirements

Degrees

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, Vol. I: Statutes and Regulations section (Appendix 1). Prospective candidates should consult with the Head of the Department most closely concerned before submitting an application for admission to candidature.

All candidates would normally begin in March Semester (near the end of February). In some cases candidates may be able to commence in July Semester (about the end of 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 minimum 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 five 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 seven years.

Degrees of Master of Agricultural Economics (MAgrEc), Master of Science in Agriculture (MScAgr) and Master of Agriculture (MAgr)

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

Units with the same name but different unit values are mutually exclusive.

Code	Unit of study	Credit points	Comment
Agricultural Chemistry			
AGCH5001	Chemistry and Biochemistry of Biological Macromolecules A	8	
AGCH5002	Chemistry and Biochemistry of Biological Macromolecules B	8	
AGCH5003	Chemistry and Biochemistry of Biological Macromolecules C	4	
AGCH5004	Chemistry and Biochemistry of Biological Macromolecules D	4	
AGCH5005	Methods of Analysis of Agricultural and Food Products and the Environ. A	8	
AGCH5006	Methods of Analysis of Agricultural and Food Products and the Environ. B	8	
AGCH5007	Methods of Analysis of Agricultural and Food Products and the Environ. C	4	
AGCH50O8	Methods of Analysis of Agricultural and Food Products and the Environ. D	4	
AGCH5009	Cereal Chemistry A	8	
AGCH5010	Cereal Chemistry B	8	
AGCH5011	Cereal Chemistry C	4	
AGCH5012	Cereal Chemistry D	4	
AGCH5013	Research Methods in Agricultural and Biological Chemistry	8	Compulsory
AGCH5018	Research Project (Agricultural Chemistry)	24	Compulsory
AGCH5019	Research Project A (Agricultural Chemistry)	16	Compulsory
Other units approved by the Head of Department up to 8 credit points			
Cereal Chemistry MAgr only			
As for Agricultural Chemistry except Cereal Chemistry A & B		8/8	Compulsory
AGCH5020	Research Project (Cereal Chemistry)	24	Compulsory
AGCH5021	Research Project A(Cereal Chemistry)	16	Compulsory
Cereal Science MAgr only			
AGCH5014	Chemistry and Biochemistry of Grains A	8	
AGCH5015	Chemistry and Biochemistry of Grains B	8	
AGCH5016	Research Methods and Communication Skills	8	
AGCH5017	Current Issues in Cereal Science	8	
AGCH5022	Research Project (Cereal Chemistry)	24	Compulsory
AGCH5023	Current Issues in Cereal Science Al	4	
AGCH5024	Current Issues in Cereal Science A2	4	
Other units approved by the Head of Department up to 8 credit points			
Agricultural Entomology			
ENTO5002	Special Topics in Entomology	8	
ENTO5003	Taxonomy and Biogeography of Insects	8	Compulsory
ENTO5004	Insect Ecology (Advanced)	8	
ENTO5005	Insect Collection	4	
ENTO5006	Research Methods in Entomology A1	8	Compulsory
ENTO5007	Research Methods in Entomology A2	8	Compulsory
Other units approved by the Head of Department up to 16 credit points			
Agricultural Genetics			
GENE5001	Biotechnology	4	
GENE5003	Cytogenetics and Genetic Manipulation	4	
GENE5007	Introductory Plant Breeding	4	
GENE5012	Research Project (Agricultural Genetics) Al	8	Compulsory
GENE5013	Research Project (Agricultural Genetics) A2	8	Compulsory
ANSC5011	Livestock Genetics	4	
BIOL3103	Molecular Genetics	12	
Other units approved by the Head of Department up to 24 credit points			
Agronomy			
AGRO5001	Advanced Crop Agronomy	8	
AGRO5002	Advanced Pasture Agronomy	8	
AGRO5003	Crop Physiology (Advanced)	6	Compulsory
AGRO5004	Plant Nutrition (Advanced)	4	
AGRO5005	Readings in Plant Nutrition	2	
AGRO5006	Research Project (Agronomy) or	24	Compulsory
AGRO5007	Research Project A (Agronomy) or	16	Compulsory

Code	Unit of study	Credit points	Comment
AGRO5008	Research Project B (Agronomy)	8	Compulsory
Other units approved by the Head of Department up to 24 credit points			
Animal Science			
ANSC5002	Animal Genetics (Advanced)	8	
ANSC5004	Poultry Production (Advanced)	8	
ANSC5009	Animal Health (Advanced)	8	
ANSC5010	Pig Production (Advanced)	8	
ANSC5012	Animal Biotechnology (Advanced)	8	
ANSC5013	Research Project Al	8	Compulsory
ANSC5014	Research Project A2	8	Compulsory
Other units approved by the Head of Department up to 8 credit points			
Biometry			
BIOM5001	Advanced Biometry	8	
BIOM5002	Applied Multivariate Analysis	8	
BIOM5004	Designing Experiments in Agriculture	8	
BIOM5005	Statistical Modelling in Agriculture	8	
BIOM5007	Research Project (Biometry) Al	8	Compulsory
BIOM5008	Research Project (Biometry) A2	8	Compulsory
Other units approved by the Head of Department up to 24 credit points			
Horticultural Science			
HORT5005	Research Project A (Horticultural Science)	18	Compulsory for GradDipAgrSc
HORT5006	Special Topics in Horticultural Science (Advanced)	4	
HORT5010	Urban Horticulture (Advanced)	4	
HORT5011	Research Project (Horticultural Science)	24	Compulsory for MAgr
HORT5012	Flower and Nursery Crops (Advanced)	4	
HORT5013	Issues in Horticultural Science A	6	
HORT5014	Issues in Horticultural Science B	6	
HORT5015	Postharvest Biology and Technology (Advanced)	4	
Other units approved by the Head of Department up to 18 credit points			
Microbiology			
MICR5001	Microbiology A (Advanced)	12	Compulsory
MICR5002	Microbiology B (Advanced)	12	Compulsory
MICR50O3	Research Project (Microbiology)	24	Compulsory for GradDipAgrSc
MICR5004	Special Aspects of Microbiology	8	Compulsory for MAgr
MICR5005	Research Project (Microbiology) Al	8	
MICR5006	Research Project (Microbiology) A2	8	
Plant Breeding			
GENE5001	Biotechnology	4	
GENE5002	Breeding for the Environment	4	
GENE5003	Cytogenetics and Genetic Manipulation	4	
GENE5004	Germplasm Management	4	
GENE5005	Plant Breeding A	8	Compulsory
GENE5006	Plant Breeding B	4	
GENE5008	Quantitative Genetics	4	
GENE5011	Research Project Additional	4	
GENE5014	Research Project (Plant Breeding) Al	8	Compulsory
GENE5015	Research Project (Plant Breeding) A2	8	Compulsory
Other units approved by the Head of Department up to 20 credit points			
Plant Pathology			
PPAT5001	Biology and Control of Viral and Bacterial Diseases	6	
PPAT5002	Defence Mechanisms of Plants	6	
PPAT5004	Research Methods in Plant Pathology A	16	Compulsory for GradDipAgrSc
PPAT5005	Soil Biology and Biodiversity	6	
PPAT5006	Special Topics in Plant Pathology	8	
PPAT5008	Research Methods in Plant Pathology B1	6	Compulsory for MAgr
PPAT5009	Research Methods in Plant Pathology B2	6	Compulsory for MAgr
CROP5006	Crop Protection (Advanced)	4	
Other units approved by the Head of Department up to 16 credit points			
Plant Protection			
PPAT5001	Biology and Control of Viral and Bacterial Diseases	6	
PPAT5002	Defence Mechanisms of Plants	6	
PPAT5003	Taxonomy and Biogeography of Insects	8	Compulsory
PPAT5005	Soil Biology and Biodiversity	6	
PPAT5006	Special Topics in Plant Pathology	8	

Code	Unit of study	Credit points	Comment
PPAT5010	Plant Protection Research Methods A1	8	Compulsory
PPAT5011	Plant Protection Research Methods A2	8	Compulsory
CROP5006	Crop Protection (Advanced)	4	
ENTO5002	Special Topics in Entomology	8	
ENTO5004	Insect Ecology (Advanced)	8	
Other units approved by the Head of Department up to 16 credit points			

Soil Conservation

SOIL5001	Advanced Methods of Studying and Analysing Soil	6	
SOIL5003	Chemistry of the Soil Environment	6	
SOIL5004	Formation, Evaluation and Management of the Soil Resource	8	Compulsory
SOIL5005	Physical Modelling of the Soil Environment	6	
SOIL5007	Soil Mineralogy, Pedogenesis and Taxonomy	6	
SOIL5008*	Soil Properties and Processes	8	Compulsory
SOIL5009	Strategies for Soil Conservation	10	Compulsory
SOIL5010	Research Project A (Soils)	8	Compulsory
AGEC5010	Natural Resource Economics (Advanced)	8	Compulsory
Other units aipproved by the Head of Department up to 16 credit points			

Soil Contamination

SOIL5001	Advanced Methods of Studying and Analysing Soil	6	
SOIL5003	Chemistry of the Soil Environment	6	
SOIL5004	Formation, Evaluation and Management of the Soil Resource	8	
SOIL5005	Physical Modelling of the Soil Environment	6	
SOIL5006	Soil Contamination	10	Compulsory
SOIL5008*	Soil Properties and Processes	8	Compulsory
SOIL5011	Research Project (Soils)	16	Compulsory
BIOM5001	Advanced Biometry	8	
Other units approved by the Head of Department up to 12 credit points			

Soil Science

SOIL5001	Advanced Methods of Studying and Analysing Soil	6	
SOIL5002	Advanced Pedology	6	
SOEL5003	Chemistry of the Soil Environment	6	
SOIL5004	Formation, Evaluation and Management of the Soil Resource	8	
SOIL5005	Physical Modelling of the Soil Environment	6	
SOIL5007	Soil Mineralogy, Pedogenesis and Taxonomy	6	
SOIL5008	Soil Properties and Processes	8	Compulsory
SOIL5010	Research Project A (Soils)	8	Compulsory
SOEL5011	Research Project (Soils)	16	Compulsory
Other units atpproved by the Head of Department up to 24 credit points			

Turf Management

CROP5001	Turf Management	6	Compulsory
CROP5002	Advanced Turf Management	8	Compulsory
CROP5003	Turf Species and Varieties	4	Compulsory
CROP5004	Applied Plant Ecology	4	Compulsory
CROP5010	Turf Nutrition	4	Compulsory
CROP5011	Research Project 1 (Turf)	10	Compulsory
CROP5012	Research Project 2 (Turf)	10	Compulsory
CROP5013	Research Project A1 (Turf)	6	Compulsory
CROP5014	Research Project A2 (Turf)	6	Compulsory
AGEC5020	Business Topics in Turf Management	4	Compulsory alternate years
BIOM5003	Data Management	4	Compulsory
CROP5005*	Irrigation Science	4	
CROP5009	Diagnostic Methods in Turf Management	2	
PPAT5005*	Soil Biology and Biodiversity	6	
SOIL5008*	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

Code	Unit of study	Credit points	Comment
AGEC5001	Research Project A	16	Mutually exclusive
AGEC5002	Research Project B	8	
AGEC5003	Agribusiness Management (Advanced)	8	
AGEC5004	Agricultural and Resource Policy (Advanced)	8	
AGEC5005	Applied Commodity Modelling (Advanced)	8	
AGEC5006	Applied International Trade (Advanced)	8	
AGEC5007	Applied Marketing (Advanced)	8	
AGEC5008	Commodity Price Analysis (Advanced)	8	
AGEC5009	Contemporary Issues in Agricultural Economics	4	
AGEC5010	Natural Resource Economics (Advanced)	8	
AGEC5011	Production Economics (Advanced)	8	
AGEC5012	Quantitative Business Management and Finance (Advanced)	8	
AGEC5014	Exploitation and Conservation of Natural Resources	8	MAgr only
AGEC5015	Applied Commodity Modelling PG (Advanced)	4	
AGEC5016	Research Methods (Advanced)	4	
AGEC5023	Special Topics in Agricultural and Resource Economics (Advanced)	8	MAgr only
ECMT3020	Applied Econometrics	8	MAgr only
ECMT5002	Econometric Applications	8	
ECMT5001	Econometric Theory	8	
ECMT6901	Econometric Modelling	8	MAgr only
ECON	Economics (Level 3 unit)	8	MAgr only
ECON3030	Forecasting for Economics and Business	8	MAgr only
ECON5002	Macroeconomics Theory	8	
ECON6002	Macroeconomics Analysis	8	
ECON5001	Microeconomics Theory	8	
ECON6001	Microeconomics Analysis	8	
ECON6003	Mathematical Methods of Economic Analysis	8	MAgr only
Other units approved by the Head of Department up to 16 credit points			

Note: MAgr 48 credit points total; GradDipAgrEc 48 credit points total.

Table of units of advanced study APEC MSDevel

Code	Unit of study	Credit points	Comment
APEC5001	Economics of Sustainable Resource Use	4	
APEC5002	Environmental Decision Making	4	
APEC5003	Environmental Law and Policy	4	
APEC5004	Research Project (Field Study and Thesis)	20	
APEC5101	Environmental Management Systems and Auditing	4	
APEC5102	Theory and Practice of Sustainable Development	4	
APEC5201	Land Use Management and Conservation	4	
APEC5202	Urban Environmental Management	4	
APEC5005	Contemporary Topics in Sustainable Development	4	
APEC5203	Cleaner Production	4	
APEC5301	Competitive Strategy in the Environmental Age	4	
APEC5302	Ecosystems and Human Society	4	

Note: APECMSDevel 48 credit points total.

CHAPTER 5

Units of advanced study

Agricultural Chemistry and Cereal Chemistry

AGCH 5001 Chemistry and Biochemistry of Biological Macromolecules A
8 credit points

AGCH 5002 Chemistry and Biochemistry of Biological Macromolecules B
8 credit points

AGCH 5003 Chemistry and Biochemistry of Biological Macromolecules C
4 credit points

AGCH 5004 Chemistry and Biochemistry of Biological Macromolecules D
4 credit points
Offered: February (A or C), July (B or D).
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 Methods of Analysis of Agricultural and Food Products and the Environment A
8 credit points

AGCH 5006 Methods of Analysis of Agricultural and Food Products and the Environment B
8 credit points

AGCH 5007 Methods of Analysis of Agricultural and Food Products and the Environment C
4 credit points

AGCH 5008 Methods of Analysis of Agricultural and Food Products and the Environment D
4 credit points
Offered: February (A or C), July (B or D).
These units 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

AGCH 5010 **Cereal Chemistry B**
8 credit points

AGCH 5011 **Cereal Chemistry C**
4 credit points

AGCH 5012 Cereal Chemistry D
4 credit points
Offered: February (A or C), July (B or D).
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 Agricultural and Biological Chemistry
8 credit points
Offered: February.
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 5018 Research Project (Agricultural Chemistry)
24 credit points

AGCH 5019 Research Project A (Agricultural Chemistry)
16 credit points

AGCH 5020 Research Project (Cereal Chemistry)
24 credit points

AGCH 5021 Research Project A (Cereal Chemistry)
16 credit points
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.

Cereal Science

Coordinator: Department of Agricultural Chemistry and Soil Science.

Objectives of the program
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 of Grains A
8 credit points
Offered: February or July. 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 of Grains B
8 credit points
Offered: February or July. Assessment: one written assignment, reports on lab work.
See AGCH 5014.

AGCH 5016 Research Methods and Scientific Communications Skills

8 credit points

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-mimite oral presentation on separate topics of their choice selected from a list which covers basic and applied aspects of cereal science.

AGCH 5017 Current Issues in Cereal Science

8 credit points

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 5022 Research Project (Cereal Science)

24 credit points

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 5023 Current Issues in Cereal Science A1

4 credit points

Offered: 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 areview paper on one of the issues covered.

AGCH 5024 Current Issues in Cereal Science A2

4 credit points

Offered: July.

See AGCH5023

Agricultural Economics

AGEC 5001 Research Project A (Agricultural Economics)

16 credit points

Offered: February and July. 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 25,000 words in length.

AGEC 5002 Research Project B (Agricultural Economics)

8 credit points

Offered: February and July. 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 lengm.

AGEC 5003 Agribusiness Management (Advanced)

8 credit points

Offered: February. **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 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.

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 and Resource Policy (Advanced)

8 credit points

Offered: July. **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

Offered: February. 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

Offered: February. **Classes:** (3 lec & 1 tut)/wk **Assessment:** one 3hrexam, 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

Offered: July. **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

Offered: February. **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 Agricultural Economics

4 credit points

Offered: July. **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

Offered: July. **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 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 greenhouse effect.

AGEC 5011 Production Economics (Advanced)

8 credit points

Offered: July. Classes: (3 lec and 2 workshops)/wk 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.

AGEC 5012 Quantitative Business Management and Finance (Advanced)

8 credit points

Offered: February. Classes: (3 lec & 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 5013 Research Methods (Advanced)

8 credit points

Offered: July. **Classes: (3** lec **& 1** tut/workshop)/wk **Assessment:** one 2hr exam, assignments.

NB: Not offered in 2000.

Topics covered will include: report preparation; techniques and methods of report writing; seminar and workshop presentation methods; visual methods including overhead slides, projected slides and video; time management techniques; research as an orderly process of enquiry; hypothesis formulation and testing; preparation of research proposals; the role of the economist; sources and collection of agricultural data; primary versus secondary data; agricultural surveys; questionnaire construction and interviewing techniques; and methods of analysis of survey data.

AGEC 5014 Exploitation and Conservation of Natural Resources

8 credit points

Offered: February or July. **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 PG (Advanced)

4 credit points

Offered: February. Classes: (2 lec & 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 leam 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
Offered: February. Classes: (3 lec & 1 lab)wk for 6 weeks
Assessment: one 1.5 hr exam, assignments.
This unit deals with the nature ofresearch 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 ofenquiry; preparation ofresearch 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 5020 **Business Topics in Turf Management**
4 credit points
Offered: July. **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.

AGEC 5023 **SpecialTopics in Agricultural and Resource Economics (Advanced)**
8 credit points
Offered: February or July. **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

AGRO5001 **Advanced Crop Agronomy**
8 credit points
Dr Jacobs
Offered: February. 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
Offered: February. 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 **Advanced Crop Physiology**
6 credit points
Dr Jacobs
Offered: February. 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
Offered: February. 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 (Advanced)**
2 credit points
Dr Campbell
Offered: February or July. **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

AGRO 5007 **Research Project A (Agronomy)**
16 credit points

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

Animal Science
Coordinator: Assoc. Prof. Wynn.

ANSC 5002 **Animal Genetics (Advanced)**
8 credit points
Assoc. Prof. Nicholas, Assoc. Prof. Moran
Offered: February. **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 (bom 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
Assoc. Prof. Balnave
Offered: February. Classes: (3 lec & 1 tut)/wk 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**

8 credit points
Dr Miller
Offered: July. 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
Assoc. Prof. Bryden
Offered: July. Classes: (3 lec & 1 tut)/wk 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
Offered: February.

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, Dr Taylor, Assoc. Prof. Nicholas, Dr Thomson
Offered: February. Classes: (3lec & 1tut)/wk. Assessment: one 3hr exam, 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 microorganism 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 A1**

8 credit points

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

ANSC 5014 **Research Project A2**

8 credit points
SeeANSC5013.

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
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
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
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 Programme, the United Nations Development Programme, the World Conservation Union, the Association of South East Asian Nations (ASEAN), the South Pacific Regional Environment Programme and the South Asian Cooperative Environment Programme.

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 (Field Study and Thesis)

20 credit points
Supervisor(s) from participating institutions
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 Environmental Management Systems and Auditing

4 credit points
Mr Robert Pagan, University of Queensland
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 IS014000. 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 and Practice of Sustainable Development

4 credit points
Professor Tor Hundloe.University of Queensland
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
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
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.

APEC 5005 **Contemporary Topics in Sustainable Development**

4 credit points

Program Director, University of Sydney and Participating Institutions

Classes: (26 hrs lec, tut, presentations and visits) **Assessment:** policy review writing and site reports.

NB: Not offered in 2000.

Developing greater coordination of environmental policies and programs in the Asia-Pacific region remains a challenge for all APEC member economies. The APEC environmental agenda is effectively a collective and consensus approach to promoting sustainable development. One of the main objectives of this agenda is to overcome the barriers to environmental regionalism by establishing and consolidating regional linkages and networks. These linkages help facilitate the implementation of joint policies and programs, encourage information exchange and create opportunities for greater research and training collaboration between government agencies, tertiary institutions and the business community. This unit deals with contemporary topics that encourages students to develop region-wide network linkages with government officials, business people and academic researchers. The unit will expose students to seminars, talks, site-visits, meetings and conferences that help them develop an understanding of the current trends and thoughts on sustainable development policies and programs among the stakeholders. These activities will also strengthen regional cooperation and encourage members of the region to develop and share a common vision and approach to sustainable development.

Textbooks

Texts as required by topics discussed.

APEC 5203 **Cleaner Production**

4 credit points

Mr Robert Pagan, University of Queensland

Classes: (26 hrs lec **&** tut). **Assessment:** Case study analysis, report writing, some fieldwork, and oral presentation.

NB: Not offered in 2000.

This unit is designed to impart knowledge of cleaner production principles and the available tools, which assist in allowing cleaner production decisions to be made. It focuses on obtaining realistic knowledge of specific industry sectors that are carrying out pollution prevention and where cleaner production progress has been made. Wherever possible, a practical approach will be given. The unit begins by placing cleaner production into the context of a changing world, discusses sustainable production issues and the background environmental pollution problems which gave rise to the term. Subsequent sessions focus on what is cleaner production, how to do it and some of the tools which are used. Industrial ecology, product design and redesign for sustainability and environmental management systems are discussed in the course.

Textbooks

Cleaner Production in the Asia Pacific Cooperation Region, United Nations Publication, 1994.

Government Strategies and Policies for Cleaner Production, UNEP, 1994.

Pagan, R. & Williams, L. Environmental Capacity Building in APEC: Policies, Programs & Research in Cleaner Production, APEC Secretariat (1998).

APEC 5301 **Competitive Strategy in the Environmental Age**

4 credit points

Assoc. Professor Ramon Abracosa, Asian Institute of Management

Classes: (26 hrs lec **&** tut). **Assessment:** Case study analysis, report writing and class participation.

*NB: Not offered **in** 2000*

This unit is designed to provide an overview of the kinds of strategies and tools that are being adopted by companies and industries to protect the environment and improve their business performance. The unit will expose students to the general frameworks for developing a competitive environmental strategy for business. The overview will consist of analysing cases and the theoretical frameworks that have been in use. Local company examples will be taken up and several guest speakers from government agencies and businesses will also be invited to share information and knowledge with students.

APEC 5302 **Ecosystems and Human Society**

4 credit points

Assoc. Professor Ramon Abracosa, Asian Institute of Management

Classes: (26 hrs lec **&** tut). **Assessment:** Case study analysis, report writing and class participation.

*NB: Not offered **in** 2000*

This unit encourages students to examine the environmental problems and issues faced by humanity in the 21st century. It focuses on both the national and international problems and examines the role of governments, businesses and NGO's in addressing the problems. The unit also analysis the strategies and tools for managing these problems, particularly those that are trans-boundary in nature.

Biometry

BIOM 5001 **Advanced Biometry**

8 credit points

Assoc. Prof. O'Neill

Offered: February. **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

Offered: July.

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

BIOM 5003 **Data Management**

4 credit points

Dr Thomson

Offered: February.

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
Offered: February. 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
Offered: July. Assessment: one 2hrexam, 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 5007 **Research Project (Biometry) A1**
24 credit points
Candidates will conduct and report on a well-defined investigation into an area of interest in biometry.

BIOM 5008 **Research Project (Biometry) A2**
8 credit points
See BIOM 5007

Turf Management

AGEC 5020 **Business Topics inTurf Management**
4 credit points
See Agricultural Economics.

CROP 5001 **Turf Management**
6 credit points
Dr Martin
Offered: February. **Assessment:** one 3 hr 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
Coordinator Dr Martin
Prerequisite: Turf Management. Offered: July. 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
Mr King, Dr Martin
Offered: July. **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; development 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 Smith, Dr Martin
Offered: July. **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
Offered: July. **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
Offered: July. Assessment: one 2hr 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
Prerequisite: Turf Management, Turf Nutrition. **Offered:** February. **Classes:** 7 lec & seven 3hr prac **Assessment:** quizzes, 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 introduction 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
Offered: February. 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.

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5012 **Research Project 2**
10 credit points

CROP 5013 **Research Project A1 (Turf)**
6 credit points

CROP 5014 **Research Project A2 (Turf)**
6 credit points
Offered: February or July.
Candidates will conduct and report on a well-defined investigation into an area of interest in turf management.

Agricultural Entomology

ENTO 5002 **Special Topics in Entomology**
8 credit points
Offered: July. **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
Offered: February. Classes: (2 lec & 6 prac)/wk Assessment: one 3hr exam & one 3hr prac 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
Offered: July. **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
Offered: July. 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
This will involve analytical laboratory work, management of experimental data and writing up of data for critical review.

ENTO 5007 **Research Methods in Entomology A2**
8 credit points
See ENTO5006.

Agricultural Genetics and Plant Breeding

BIOL 1303 **Molecular Genetics and Recombinant DNATechnology**
12 credit points
This unit is offered by staff in the School of Biological Sciences, Faculty of Science.

GENE 5001 **Biotechnology**
4 credit points
Dr Sharp
Offered: February.
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
Offered: February.
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
Offered: February. **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
Offered: July. 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
Classes: mid-year break (end of March). **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
Offered: July. 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
Offered: February.
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
Offered: February.
A series of lectures and practical periods, dealing with population genetics and quantitative inheritance.

GENE 5011 **Research Project Additional**
4 credit points
Offered: February or July.
See GENE 5010.

Note: In an attempt to assist Australian students wishing to complete this degree while simultaneously working in industry, it is intended to run each of the above four-credit point units as an intensive two-week program at least once every two years, so that part-time students can complete the course on a pro rata basis. These intensive units would be conducted during the University vacation periods, when college facilities should be readily available.

The eight- and four-credit point units in plant breeding will also be presented on a similar basis; however fieldtrips will need to be adjusted to seasonal limitations, with part-time students having a choice as to the year of participation in each field trip.

GENE 5012 **Research Project (Agricultural Genetics) A1**
8 credit points
Candidates will conduct and report on a well-defined investigation into an area of interest in agricultural genetics.

GENE 5013 **Research Project (Agricultural Genetics) A2**
8 credit points
See GENE5012

GENE 5014 **Research Project (Plant Breeding) A1**
8 credit points
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
See GENE5014.

Horticultural Science

HORT 5005 **Research Project A (Horticultural Science)**
18 credit points
Candidates will conduct and report on a well-defined investigation into an area of interest in horticulture.

HORT 5006 **Special Topics in Horticultural Science**
4 credit points
Offered: February or July.
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
Dr Martin
Offered: February. Classes: (3 lec 3 prac)/wk Assessment: one 2 hr exam (50%) prac reports (25%) assignments (25%).
The unit covers the horticultural botany of the main species used in urban plantings; 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) (MAgr)**
24 credit points
Offered: February and July
Candidates 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
Offered: July. **Classes:** (2 lec, 2 prac)/wk; **Assessment:** one 2hr exams (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 5013 **Issues in Horticultural Science A**
6 credit points
Offered: February. Classes (1 lec 1 sem 1 lab)wk; 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 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 5014 **Issues in Horticultural Science B**
6 credit points
Offered: July. Classes (1 lec 1 sem 1 lab)wk; **Assessment:** one 1 hr exam, essay and/or a design and report
See HORT5013

HORT 5015 **Postharvest Biology and Technology (Advanced)**
4 credit points
Dr McConchie
Offered: July. 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.

Microbiology

MICR 5001 **Microbiology A (Advanced)**
12 credit points
Dr Ferenci
Corequisite: MICR 5002 Microbiology A (Advanced). Offered: February. Classes: (3 lec, 6 prac, 3 other activities)/wk.
Assessment: one 1.5 hr and one 2 hr theory exams, essay, 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
Corequisite: MICR 5001 Microbiology A (Advanced). Offered: July.
Classes: (3 lec, 6 prac, 3 other activities)/wk. Assessment: one 1.5 hr and one 2 hr theory exams, essay, 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.

MIC R 5003 **Research Project**
24 credit points
Dr Ferenci.
Candidates are required to undertake a project and submit a report in some advanced aspect of agricultural microbiology related to the area of interest.

MICR 5004 **Special Aspects of Microbiology**
8 credit points
Dr Ferenci.
The unit of study may include tutorials, seminars, essays and directed reading on selected topics.

MICR 5005 **Research Project (Microbiology) A1**
8 credit points
Dr Ferenci.
Corequisite: MICR 5006
Offered: February
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
Corequisite: MICR 5005. **Offered:** July.
See MICR5005.

Plant Pathology and Plant Protection

PPAT 5001 **Biology and Control of Viral and Bacterial Diseases**
6 credit points
Dr Bowyer
Offered: February. Assessment: one 3hr exam, assignment.
Lectures and laboratory classes on the characteristics of viruses and bacteria and their interactions with plants, and the principles of disease control.

PPAT 5002 **Defence Mechanisms of Plants**
6 credit points
Prof. Deverall
Offered: February. Assessment: one 3hrexam, 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
Offered: July.
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
Offered: February. 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
Offered: July.
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 5008 **Research Methods in Plant Pathology B1**
6 credit points
Offered: February
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 5009 Research Methods in Plant Pathology B2
6 credit points
Offered: July.
See PPAT5008

PPAT 5010 Plant Protection Research Methods A1
8 credit points
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
Assessment: assignment.
See PPAT5010.

Soil Science, Soil Conservation and Soil Contamination

AGEC 5010 Natural Resource Economics (Advanced)
8 credit points
See Agricultural Economics.

SOIL 5001 Advanced Methods of Studying and Analysing Soil
6 credit points
Offered: July. **Classes:** (3 lec, 1 tut & 8hr prac)/7wks (second half)
Assessment: one 2hr exam, field and prac reports, problem sets, essay.
Approaches to scientific investigation and methods of literature survey followed by tutorial on computer search techniques.

Physical: Particle Size Analysis (PSA) of clay fraction and fractionation by centrifugation techniques, specific surface area measurements by BET Thermocouple methods for field measurements of moisture. Thermal conductivity methods for soil moisture content, Gamma and neutron probe methods for field measurements of moisture content and bulk density and time-domain reflectometry.

Physico-chemical: Measurement of oxidation-reduction status, 02 diffusion rate and O2, CO2 concentrations in soil, selective ion-electrodes for measurements of ion activities in soil solution.

Geotechnical: Mechanical measurements of soil properties including Atterberg limits, unconfmed compression, penetrometer, Proctor and compaction, torsion shear box, dynamometer, rupture-test and drop shatter test, sampling and testing procedures for determining physical properties of swelling soils.

Soil structural: Soil structure and stability tests in relation to aggregate size and soil micro-aggregates. Fractionation of soil organic matter and determination of principal functional groups involved in CEC and complexation of heavy metals.

SOIL 5002 Advanced Pedology
6 credit points
Offered: February.
Prof. McBratney for description.

SOIL 5003 Chemistry of the Soil Environment
6 credit points
Offered: July. 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 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 and sodicity, oxidation/ reduction reactions in soil and chemistry of soil organic matter and nitrogen.

SOI L 5004 Formation, Evaluation and Management of the Soil Resource
8 credit points
Prof. McBratney
Offered: July. 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 the Soil Environment
6 credit points
Prof. McBratney
Offered: February. **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, 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 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
Lecturer Prof. McBratney
Offered: July. 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 reinstatement. 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 establishment, 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 and Taxonomy
6 credit points
Offered: February. 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, rnicromorpho-

logical 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
Offered: February. **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 micronutrients 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
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
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

16 credit points
Candidates will conduct and report on a well-defined investigation into an area of interest in soil science or soil contamination.

CHAPTER 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 N.S.W. Wheat Research Foundation, members of the Faculty of Agriculture, and a representative of the N.S.W. Minister for Agriculture and Rural Affairs. The Professor of Plant Breeding is the Director of the Institute.

(See the University of Sydney Calendar, Vol. I: Statutes and Regulations section, Appendix 1)

Institute of Advanced Studies

The Institute of Advanced Studies was established within the Faculty of Agriculture 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.

(See the University of Sydney Calendar, Vol. I: Statutes and Regulations section, Appendix 1)

Postgraduate scholarships and prizes

The tables below are a summary only; for full details concerning the conditions governing the awards of these prizes and scholarships contact the Scholarships Office.

Awards not restricted to graduates in Agriculture

Travelling scholarships

Baillieu Research Scholarship
H.S. Carslaw Memorial Scholarship
William and Catherine Mcllrath Scholarship
The Rhodes Scholarship
The Nuffield Foundation Dominion Travelling Fellowships
Science Research Scholarships of the Royal Commission for the Exhibition of 1851
The Gowrie Postgraduate Research Scholarships
The J.B. Watt Travelling Scholarship
The James King of Irrawang Travelling Scholarship*
The G.H.S. and I.R. Lightoller Scholarship*
The University of Sydney Postgraduate Research Travelling Scholarships
The Charles Gilbert Heydon Travelling Fellowship in the Biological Sciences
The Eleanor Sophia Wood Travelling Fellowships
The Herbert Johnson Travel Grants*
The Rotary Foundation Ambassadorial Scholarships
The Commonwealth Scholarship and Fellowship Plan Awards
CSIRO postdoctoral studentships.
*Grants in aid

Other scholarships are available.

Enquiries about scholarships should be made at the Scholarships 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.

Scholarship	Value $ (1999)	Closing date for applications	Other information
Tenable at the University of Sydney			
Australian Postgraduate Awards	16135	31 October	Graduates with Hons I. For research in any field
University of Sydney Postgraduate Awards	16135	31 October	Graduates with Hons I. For research in any field
Henry Bertie and Florence Mabel Gritton Postgraduate Research Scholarships	16135	January	For research in chemistry in relation to industry and agriculture
Richard Claude Mankin Scholarship - Postgraduate	as APA	as advertised	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	31 May	Travel grant or grant-in-aid to candidates in the discipline of agricultural entomology
Irvine Armstrong Watson Scholarship	up to 500	31 May	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 F.H. Loxton is restricted to males) and are awarded annually depending on the availability of funds.

Scholarship	Value $ (1999)	Closing date for applications	Other information
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
W.C. Turland Postgraduate Scholarship	as above	31 October	as above
F.H. Loxton Postgraduate Scholarship	as above	31 October	as above. Restricted to males

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 Thurbum Scholarship, the W.C. Turland Postgraduate Scholarship, the F.H. Loxton Studentship and the McCaughey Memorial Institute Scholarship 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 of Agriculture.
2. The scholarships shall be awarded by the Faculty of Agriculture, 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 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 of Agriculture, 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.

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 HughThurburn 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.

W.C.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 W.C. Turland Postgraduate Scholarship.

F.H. Loxton Postgraduate Scholarship

[Under review]

Established in 1960 under the will of F.H.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. A studentship is available in each of the foregoing faculties.

The studentships are awarded under the following conditions:

1. The name of the studentships shall be the F.H.Loxton Postgraduate Studentships.
2. The object of the studentships shall be to enable a male graduate of any university to engage in postgraduate research within the University of Sydney in the Faculties of Veterinary Science, Agricultural Science and Engineering.

(Remaining conditions for Agriculture are the same as for Turland, Pawlett etc)

The McCaughey Memorial Institute Scholarship

(Currently suspended)

Established in 1989 by an offer from the McCaughey Memorial Institute to encourage studies in the agricultural sciences, with particular relevance to rice.

The scholarship shall be awarded under the following conditions:

1. The name of the scholarship shall be The McCaughey Memorial Institute Scholarship.
2. The scholarship shall be awarded by the Faculty of Agriculture, on the recommendation of the Dean of the Faculty, to a student enrolling as a full-time candidate for a higher degree by research and thesis in the agricultural sciences with particular relevance to rice, providing the student's work is of sufficient merit.

3. In awarding the scholarship, 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 objective of the scholarship.
4. The annual value of the scholarship shall be equal to the value of an Australian Postgraduate Award and shall provide the same allowances except that the recipient shall be eligible to apply for a Research Grant offered by the McCaughey Memorial Institute up to the value of $5000 per annum.
5. The conditions and tenure of the scholarship shall be the same as those for the Australian Postgraduate Research Awards except that non-residents of Australia are eligible to apply and the scholarship is not transferable to another institution.
6. The recipient shall acknowledge the tenure of the scholarship in any thesis or other publication which shall result from such tenure.
7. Recipients may not occupy any salaried position or hold any other award during the term of appointment except for that approved by the APA conditions, unless approval has been given by the Faculty.

Postdoctoral and visting fellowships

Thomas Lawrance Pawlett Postdoctoral Scholarship

(Currently suspended)

The scholarship is awarded under the following conditions:

1. The name of the scholarship shall be the Thomas Lawrance Pawlett Postdoctoral Scholarship.
2. The objects of the postdoctoral scholarship shall be the encouragement and promotion of the scientific study of agriculture in connection with the University of Sydney.
3. One postdoctoral scholarship shall be awarded by the Senate of the University acting on the recommendation of the Faculty of Agriculture normally to persons holding the degree of Doctor of Philosophy in the Faculty of Agriculture of the University or in another university. However, persons who have research publications revealing equivalent status or who are awaiting the result of a PhD examination, shall be considered eligible to apply for an award.
4. In awarding the postdoctoral scholarship, consideration shall be given to the academic record of the applicants, their postgraduate career, and their special aptitude and ability to carry out the objects of the foundation.
5. (a) The postdoctoral scholarship shall be of the annual value of $5000. The payments shall be made half-yearly in advance. In the case of resignation or other withdrawal from the scholarship, payment of the salary shall be made for the time during which the scholarship may have been actually held. An additional amount of up to $800 may be granted for travelling expenses for the scholar.
   (b) When funds are available, the Faculty may recommend the award of up to three travel grants to persons who are eligible for the postdoctoral scholarship (see clause 3 above). The travel grants shall have a value of up to $1800 and may, with the approval of the Senate, be held concurrently with another award which accords with the objects of the Thomas Lawrance Pawlett Postdoctoral Scholarship.
6. No scholar shall, except with the approval of the Senate, occupy any salaried position or undertake any employment for payment or hold any other award during the term of appointment, and every scholar shall work full-time on the research the scholar has been appointed to carry out.
7. The postdoctoral scholar shall be required to furnish a report on the completion of tenure of the scholarship to the Faculty of Agriculture. In the case of all work published in the form of papers or reports, as the result of holding the postdoctoral scholarship, the scholar shall furnish a copy to the Faculty of Agriculture and shall distinctly indicate that the scholar is the holder of a Thomas Lawrance Pawlett Postdoctoral Scholarship of the University of Sydney.
8. (a) The postdoctoral scholar who is a Doctor of Philosophy of the University of Sydney may apply to carry out investigations at the University of Sydney or at such other place, or places, as may be approved by the Faculty of Agriculture.
   (b) The postdoctoral scholar who is a Doctor of Philosophy of another university shall carry out investigations at the University of Sydney.
   (c) All postdoctoral scholars must undertake to conform to the regulations drawn up by the University of Sydney.
9. The postdoctoral scholarship shall be tenable for one year.
10. The Senate may prescribe, from time to time, such further regulations as may be found necessary.

Awarded when funds are available.

Thomas Lawrance Pawlett Visiting Scholarship

(Currently suspended)

The scholarship is awarded under the following conditions:

1. The name of the scholarship shall be the Thomas Lawrance Pawlett Visiting Scholarship.
2. The object of the scholarship shall be the encouragement and promotion of the scientific study of agriculture in connection with the University of Sydney.
3. The scholarship which shall be available each year shall be awarded by the Senate of the University acting on the recommendation of the Faculty of Agriculture to overseas scholars distinguished in some fields related to the scientific study of agriculture.
4. The scholar shall undertake research for a minimum period of one semester in the University of Sydney in the appropriate department.
5. The scholarship shall be of the value of $3500.
6. The scholarship may be held concurrently with another award or remuneration.

Thurburn Visiting Fellowship

(Currently suspended)

Under the will of Mary Esme Thurburn, who died in 1970, the residuary estate was bequeathed to the University of Sydney Faculty of Agriculture to be used for such purposes as the Senate may determine.

In 1975 the following conditions of award were approved:

1. The name of the fellowship shall be the Thurburn Visiting Fellowship.
2. The object of the fellowship shall be the encouragement and promotion of study in agriculture within the Faculty.
3. The fellowship shall be awarded from time to time by the Senate of the University on the recommendation of the Faculty of Agriculture.
4. The Fellow shall participate in research, public discussion and lecturing for a minimum of one semester.
5. The Fellow will receive an allowance of $500 per week, with a maximum allowance of $8000. There will be an additional grant to cover economy class return air travel by the most direct route and the most economical rate available at the time.
6. An allowance of up to $1500 may be made, on the recommendation of the Institute of Advanced Studies, to assist with expenses associated with the Fellow's visit.

Grants in Aid

Grants-in-aid are designed to provide supplementary living allowances, travel grants or grants-in-aid. Applicants must be:

(1) graduates or graduands of the University of Sydney who are of not more than four years' standing from qualifying for the first degree appropriate to the proposed course of study overseas; 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 31 May in each year.

These awards, details of which follow, are currently offered as grants-in-aid only in the Faculty of Agriculture:

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 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 in the hands of the Registrar by 31 May each year.

Irvine Armstrong Watson Scholarship

The scholarship was established in 1987 by a donation of $5000 by Mrs Loloma Watson and family in memory of their husband and father, Emeritus Professor Irvine Armstrong Watson.

The scholarship is awarded under the following conditions:

1. The name of the scholarship shall be the Irvine Armstrong Watson Scholarship.
2. The object of the scholarship shall be to further studies in the disciplines of agricultural genetics, biometry, plant breeding or plant pathology.
3. The scholarship shall be awarded by the Faculty of Agriculture 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 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 in the hands of the Registrar by 31 May each year.

CHAPTER 7

Other Faculty information

This chapter of the handbook contains information specific to the Faculty of Agriculture 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 the Student Centre and 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
First semester	June	2 weeks
Second semester	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 March semester.

The following information applies to the Bachelor of Science in Agriculture, Bachelor of Horticultural Science, Bachelor of Land and Water Science, the Bachelor of Agricultural Economics and the Bachelor of Resource Economics degrees.

Notification of examination results

The results of annual examinations are displayed on noticeboards near the Student Centre and posted directly to you at the end of the year.

Disclosure of examination marks

Final marks will appear on your annual 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.

The Senate has approved the recommendation that no provision be made for students to have their examination papers re-marked.

Examination grades

Each subject taken will be allotted one of the following grades at the annual examinations:

Grade	Per cent
High Distinction	85-100
Distinction	75-84
Credit	65-74
Pass	50-64
Pass (Concessional)*	46-49
Fail	below 46

*See section on concessional passes.

Concessional passes

A concessional pass is deemed to fulfil any requirements for the student to continue in the degree course unhindered.

Award of concessional passes

The concessional pass is not available for candidates in the BAgrEc and BResEc degrees.

The following conditions shall normally guide the Board of Examiners in the award of a concessional pass to candidates in the BScAgr, BHortSc and BLWSc degrees:

(a) Concessional passes in units of study with marks in the range 46 to 49 may be counted for the degrees to a maximum of 12 credit points in First Year units of study and to a maximum of 14 credit points in Second Year units of study.

(b) When Concessional pass results total more than 12 or 14 credit points, the student will decide which unit of study or units of study to count for the degree.

(c) Concessional passes will not be awarded for Third and Fourth Year units of study.

(d) Having awarded a concessional pass to a candidate, the Faculty shall not alter the mark awarded to the candidate by a department.

Faculty resolutions

Further tests for the BAgrEc, BResEc, BScAgr, BHortSc and BLWSc degrees

1. Further tests may be awarded by the examining department where the candidate has been prevented by sufficient and duly certified illness or misadventure from completing the assessment for a unit of study. Such further tests are privileges and not rights.
2. Further tests may also 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.

3. Where possible and practicable, all further tests will be administered and results finalised before the Board of Examiners' Meeting.
4. Incomplete results at the time of the Board of Examiners are recorded by the symbol 'INC (Incomplete). Except in special cases approved by Academic Board, this result must be converted to a normal permanent passing or failing grade, normally at the meeting of the Board of Examiners (or, where special circumstances apply, at the latest, by the end of the second week (third week for March Semester) of the next session or semester as appropriate, when, in the absence of any final result provision, the result will default to AF). Used when the examiners have grounds (illness or misadventure) for seeking more information or for requiring the submission of additional work from the student in order to corifirm a result.
5. The Head of Department is responsible for the awarding, timetabling and conduct of further tests, which may take such form as the Head of Department 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.
6. Individual students granted a further test should wherever possible be given at least three days' prior notice. A candidate who is absent from a further test without sufficient reason will be deemed to have failed the test.
7. In respect to the notification of students referred to in sections 5 and 6, students will be deemed to have been notified by the Department as a result of the posting of information by the due date on official noticeboards as advised by the Department concerned.
8. It is the responsibility of the student to provide written evidence of illness or misadventure to the appropriate Head of Department 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 where there is sufficient reason why it has not been presented by that date.
9. The highest grade of award following a further test is Pass, except where the further test is granted on the grounds of illness or misadventure.

Illness or misadventure

You may apply to the Faculty 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.

Award of honours at graduation

Extract from resolutions of the Faculty

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 heads of departments and sections concerned.
3. All candidates 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 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, students 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.(1) 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.

4.(2) For the BScAgr, BHortSc and BLWSc 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.(1) 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 in 2nd and 3rd Years
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.

6.(2) For the BScAgr, 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 Fourth Year WAM	Minimum WAM in 2nd and 3rd Years
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 and section concerned to make a substantial case for such a departure.

7. The Board of Examiners 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 B AgrEc and BResEc degree, a university medal may be awarded, on the recommendation of the Head of the Department of Agricultural 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/Third Year WAM of at least 75.

8.(2) (under review) For the BScAgr, BHortSc and BLWSc degrees, a university medal may be awarded, on the recommendation of the Head of Department concerned, to a student who has a Level 4 WAM of at least 85, an overall honours mark of at least 80 and a SeconcVThird Year WAM of at least 75.

Exclusion

Restriction upon re-enrolment

There are certain circumstances in which you could be asked to show good cause why you should be permitted to repeat any previously attempted study. Liability for exclusion from re-enrolment is determined by academic attainment during the immediate past one or two academic years (depending upon the faculty or board of studies concerned). The resolutions of the Senate restricting re-enrolment may be found in the University's Calendar, Vol I: Statutes and Regulations, indexed under 'Re-enrolment'. You should acquaint yourself with the studies in which you are enrolled. If you are in any doubt about your liability for exclusion following academic failure or discontinuation of courses you should ask advice of the Exclusions Officer in the Records Services Unit.

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.

Extract from resolutions of the Senate relating to the Faculty of Agriculture

10.(1) The Senate authorises the Faculty of Agriculture to require a student to show good cause why he/she should be allowed to re-enrol in the Faculty of Agriculture if, in opinion of the Faculty, he/she has not made satisfactory progress towards fulfilling the requirements of the degree.

(2) Satisfactory progress cannot be defined in all cases in advance but a student who has -

(i) twice failed, or discontinued enrolment to count as a failure, any unit of study as defined in the resolutions relating to the degrees of Bachelor of Science in Agriculture, Bachelor of Horticultural Science, Bachelor of Land and Water Science, Bachelor of Agricultural Economics or Bachelor of Resource Economics, or

(ii) at the annual examinations in the second or any subsequent year of enrolment, failed more than sixty per cent of the credit points for which enrolled and has also obtained a weighted average mark of less than fifty per cent in the total number of credit points for which enrolled in the two most recent years of enrolment, shall be deemed not to have made satisfactory progress.

(3) In cases where the Faculty permits the re-enrolment of a student whose progress has been deemed unsatisfactory, the Faculty may require the completion of specified units of study in a specified time, and if the student does not comply with these conditions the student may again be called upon to show good cause why he/she should be allowed to re-enrol in the Faculty of Agriculture.

Professional experience

The opportunity to gain personal experience in some of the many branches of your chosen profession can be one of the most memorable and productive parts of your University career. In this Faculty we encourage you to develop a really useful program for yourself. We provide a list of over 5000 enterprises which students have visited in recent years. You can contact some of these people or use your own resources; we encourage interstate and overseas visits in your program. The Faculty provides regional, interstate and overseas excursions which can be part of your program. You can use the opportunity to check out possible directions for your career, make contacts for the future or just broaden your horizons. The Faculty has a minimum requirement, but you may extend this and the Faculty will provide you with a certificate which sets out what you have achieved. The Downing Prize of $350 is awarded for the most proficient program over the 4 years.

Senate Resolutions require that students undertake professional experience in University vacations as an integral and essential part of their overall training.

The aims of professional experience are to:

1. familiarise students with agricultural and horticultural 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.

Faculty resolutions (BAgrEc and BScAgr)

1. Candidates must complete 18 weeks of professional experience. Each component of the experience must be approved on behalf of the Dean before it is undertaken. 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 your on-farm experience include:
   (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 Professional Experience Report must be submitted following each visit to a farm or organisation. Time credited towards professional experience is subject to a satisfactory and timely report. Students are required to submit a First year and a Senior report on farms. There are also General and Non-Farm reports. A maximum of 3 'General Reports' (for up to one week on commercial farm situations only) can be credited. Non-farm experience reports must follow the summary set out in the Professional Experience Report Book. There is no provision for short 'general' reports for this part of the program. Late reports

normally are not credited. Time penalties are applied to resubmitted and incomplete reports.

4.* Students are required to attend *one of 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. A senior report must be completed on a commercial farm. This should be undertaken in either Second, Third or Fourth year.

6. Final year students wishing to graduate must complete all practical work requirements by 15 February of the year of graduation. **Reports from graduands submitted after 14 January will not be marked until the July semester.**

Faculty resolutions (BHortSc)

1. Candidates must complete 18 weeks of professional experience. Each component of the experience must be approved on behalf of the Dean before it is undertaken. 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 Professional Experience Report must be submitted following each visit to a farm or organisation. Time credited towards professional experience is subject to a satisfactory and timely report. Students are required to submit a First year and a Senior report on farms. There are also General and Non-Farm reports. A maximum of 3 'General Reports' (for up to one week on commercial farm situations only) can be credited. Non-farm experience reports must follow the summary set out in the Professional Experience Report Book. There is no provision for short 'general' reports for this part of the program. Late reports normally are not credited. Time penalties are applied to resubmitted and incomplete reports.

4.* Students are required to attend the Faculty Horticulture Excursion to the north coast of NSW, or if this is not available during the student's Second or Third year, the Faculty Northern 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. A senior report must be completed on a horticultural production farm. This should be undertaken in either Second, Third or Fourth year.

6. 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.**

Faculty resolutions (BResEc)

1. Candidates must complete 18 weeks of professional experience. Each placement must be approved on behalf of the Dean before it is undertaken.
   The full complement of the rules for BResEc was still in draft stage at the time of printing. Requirements in respect of excursions were still under consideration at the time of printing.

Excursions

The Faculty arranges three NSW excursions each year and often sponsor other excursions to the Northern Territory and to South East Asia. There is also a specialist excursion for Horticulture students. Students can count up to 4 weeks of these trips towards their Professional Experience program if they wish.

Each of the trips is voluntary although all students must complete one NSW trip during their course. Each trip begins at a distant NSW location and is set up so that it is convenient to use trains to reach the area and return to Sydney, students can also make their own way. The Faculty arranges all local transport, food and accommodation.

* **The excursions are held each year as follows:**

(a) First Year - Central NSW, down the Macquarie valley, during the week which commences with Easter Monday in the mid-semester break of 1 st semester.

(b) South West NSW Excursion - the first week of the 2 nd semester mid-semester break (the end of September, just before the October long weekend).

(c) North Western NSW Excursion - during Orientation Week. (a special Horticulture excursion to the north coast of NSW is also held and is a requirement for BHortSc)

(d) Senior Years (2nd, 3rd or 4th years) - winter mid semester break, usually to the Northern Territory (subject to approval).

Ancillary fees and charges

The following fees and charges from 1999 can be a guide for similar charges in 2000.

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 $100-120, depending on the excursion). The balance of the accommodation costs, transport and some meals are covered by the Department.

Department of Crop Sciences

The Department gives all first to third students 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 $10 per 125 pages. Fourth Year and Postgraduate students have unlimited printing rights but printing is monitored on an individual basis.

Agricultural Science 1

Handbook at cost, approximately $10 (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 1998 the charge was $10 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 ($11.00 in 1999). 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 courses
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 $90 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 8 cents per page. Students are advised of these facilities and the charge during training 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.

Cadetships

Students interested in applying for government cadetships should enquire at the nearest Careers Reference Centre.

Matriculation 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

Distinguished Undergraduate Scholarships and Undergraduate Scholarships
Both scholarships are provided by the University of Sydney from University funds and funds donated by previous students of the University (the Alumni). The Distinguished Undergraduate Scholarships are currently valued at $8,000 per year while the Undergraduate Scholarships are valued at $5,000 per year for the normal full-time duration of a student's first degree, subject to satisfactory progress. These scholarships are available to applicants who:

- are citizens or permanent residents of Australia;
- are taking the Higher School Certificate* examination in 1999, or were awarded a HSC* in 1998 and have not commenced any university study;
- have personal attributes such as creativity, leadership, self-motivation and good communication skills.

*Undergraduate Scholarships - NSW in 1999 only, must expect to achieve a Universities Admission Index of at least 95 Distinguished Undergraduate Scholarships - any Australian state, must have or expect to achieve a UAI of at least 98.

Application forms and further information can be obtained from school career advisers and year 12 co-ordinators in July, or from the University's Scholarships Office. Applications close on 30 September.
Other Scholarships
These include Council of Education Scholarship, The Freemasons' Scholarship, Martin Mcllrafh 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 BScAgr or BHortSc degree and a further two are tenable by students enrolling in the third year of the BScAgr or BHortSc degree, the first being awarded to the student showing greatest proficiency in the first-year examinations and the second awarded for greatest proficiency in the first-year Chemistry units of study. A further two are tenable by students enrolling in the third year of the BScAgr or BHortSc 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 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.

Prize or scholarship	Value $	Qualification
ABARE 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 AgriculturalChemistry 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
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
W.W. 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	300	Proficiency in Third Year Examinations
D.L. Jackson	400	Proficiency in Agricultural Science I or Horticultural Science 1
EC. McCleery Memorial Award	200	Fellowship and Leadership in the Faculty (Third Year students)
Martin Mcllrafh Scholarshipst	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 CropScience 2 and Soil Science 2
F.L. Partridget	400	For students in Third and Fourth Years in need of financial assistance
Poultry Research Foundation	400	Proficiency in Fourth Year Animal Production
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
G.W. Walker Memorial Essay	100	Most proficient essay in the unit Applied Marketing
Professor W.L. Waterhouse	80	Proficiency in Agricultural Genetics 2 & Plant Disease 3
Sir Robert Watt Memorial	80	Proficiency in Crop Science 2
Weed Society of N.S.W.	100	Proficiency in Weed Science
N.H. White Memorial Prize	100	Proficiency in Plant Pathology in Fourth Year
A.R. 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

tApplicant required to submit an application to the Scholarships Office.

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 Head of the Department of Animal 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.

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, $300.

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.

W.W. 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.

D.L. 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 or Horticultural Science 1 provided that the candidate's work is of sufficient merit. Value, $400.

F.C. McCleery Memorial Award

Established 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 N.S.W. 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 the professor 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.

F.L. 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 Head of the Department of Animal 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.

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.

G.W.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 W.L. 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 course 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 (MICR3001 or 3901) and (MICR3002 or 3902) Microbiology 3 or MICR3102 Agricultural Microbiology 3. Value, $100.

N.H.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.

A.R. Woodhill 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 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.

ArthurYates 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 the professor 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 Department of Crop Sciences after consulting the professor 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 (BScAgr, 1993), to encourage and assist outstanding undergraduate students in Agriculture.

The scholarship may be awarded annually, on the recommendation of the Dean on the advice of a Faculty Selection Committee, to a student who enrols full time in the Fourth Year of the 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 widi 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 of Australia Customer Service Division Scholarship

The CB A 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 of Australia (CBA) Customer Service Division, awards the Commonwealth Bank of Australia (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 interview by CBA staff.
3. The Scholarship comprises a flat payment 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.
4. The scholarship holder must undertake paid vacation employment with CBA 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 CBA as soon as they become available.
7. The CBA 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 warrents reconsideration of the award of the scholarship.
8. The scholarship holder will not accept any other scholarship without obtaining prior permission from the CBA.
9. Upon completion of studies, the scholarship holder is expected to work for CBA, Customer Service Division, for a reasonable period of time if a suitable full-time position is identified.

The Elders Agronomy Scholarship

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.

The Incitec Scholarship

[Suspended in 1999 and 2000]

Incitec Ltd has offered two-year undergraduate scholarships. The first was awarded in 1997. 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.

Terms and conditions

[Revised terms are being considered]

1. The Faculty of Agriculture awards the INCITEC Scholarship to a third year full-time Bachelor of Science in Agriculture or Bachelor of Agricultural Economics student of the University of Sydney.
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 INCITEC 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 two payments of $3,000 payable at the beginning of the scholarship holder's third and fourth years of study to assist in the payment of education expenses.
4. The scholarship holder will forward semester results to INCITEC as soon as they become available.
5. The scholarship holder will consult with the Faculty and INCITEC prior to selection of any substantial elective component of the coursework.
6. The scholarship holder must undertake paid vacation employment with INCITEC between the second and third (6-8 weeks) and the third and fourth (6-8 weeks) academic years or 12-16 weeks at some vacation time mutually agreeable to INCITEC and the student.
7. During vacation employment the scholarship holder will be employed as a full-time staff member of INCITEC, at a location selected by the company following consultation with the scholarship holder.
8. The Faculty and INCITEC expect the scholarship holder to undertake limited extracurricular activities and training, particularly public speaking and presentation skills, and develop a network of referees.
9. The Faculty reserves the right to revoke the scholarship at any time, following consultation with INCITEC, 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 INCITEC.

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 is *not* normally a part of the selection process.

Newports Nursery Scholarship in Horticulture

Newports Nursery 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.

Newports Nursery, 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. Newports 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 Newports Nursery 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 Newports staff 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 Newports Nursery as soon as they become available.
5. The scholarship holder will consult with the Faculty and Newports Nursery prior to selection of any substantial elective component of the coursework.

6. The scholarship holder must undertake paid vacation employment with Newports Nursery 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 Newports Nurseries and the student.
7. During vacation employment the scholarship holder will be employed as a full-time staff member of Newports Nursery, at a location selected by the company following consultation with the scholarship holder.
8. The Faculty and Newports Nursery 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 Newports Nursery, 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 Newports Nursery.

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 1998 and 1999, 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 2000

Application forms from the Association at Membership Services on (02) 9251 1700.

Value: in 2000 is $5,000.

Trinity Grammar School Teaching Internship

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 Science in Agriculture or Bachelor of Horticultural Science.

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 N.S.W. 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.
(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 2000 shall be $6100 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 R D 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.

Libraries

University of Sydney Library

http://www.library.usyd.edu.au/

A large network of 24 Libraries supports staff and students of the University of Sydney. The specialist libraries for research in Agriculture are Badham Library (covers agriculture, agricultural economics, agricultural chemistry, soil science, biological sciences, genetics, botany and veterinary science) and Geosciences Library (covers earth sciences and geography including GIS). Fisher Library holds resources of interest to first year students and also the economics collection.

The Library homepage is located at http://www.library.usyd.edu.au/ and provides access to services including the Library catalogue and databases that index journal articles. Key databases for Agriculture are CAB Abstracts, Agricola, Biological Abstracts and ABOA. Passwords to access these databases from outside campus are available to staff and students of the University. Please contact the Library for more information.

Badham Library

Ground Floor, Badham Building A16, Science Road, Camperdown Campus, University of Sydney NSW 2006

Phone:+61 2 9351 2728
Fax:+61 2 9351 3852
Email: badham@library.usyd.edu.au

Open from 8.30 am - 7.30 pm Monday to Friday and from 10 am - 5 pm on Saturdays during semester time and out of semester from 9 am - 5 pm. Check the web at http://www.library.usyd.edu.au/Services/Libraries/Badham/index.html for information on the current opening hours.

Please check http://www.library.usyd.edu.au/Services/Libraries/Geosciences/index.html for details of the Geosciences Library and http://www.library.usyd.edu.au/Services/Libraries/Fisher/index.html for details about Fisher.

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 445. Any student seeking assistance should call at the Centre, or phone 9351 4061.

Faculty societies

The Sydney University Agricultural Society

The Agricultural Society is an association of the undergraduates of the Faculty of Agriculture which controls the social and sporting functions associated with the Faculty. The function and organisation of the Society will be explained in detail at the official welcome to new students held in the orientation period.

Membership

There is an annual subscription for society membership. This fee entitles you to the privilege of voting arid holding office, enables you to take part, in the many social and sporting activities organised by the Society. A membership card is presented to each new member.

Benefits of membership

The Society receives an annual grant from the Students' Representative Council, the size of which depends on the number of members. Membership of many faculty societies is compulsory. This is not the case in Agriculture, yet last year there was over 90% membership. This is an indication of the 'esprit de corps' for which the small and close Faculty of Agriculture is noted.

The main benefits from membership of the Society are derived from participation in the various functions held throughout the year.

Special activities include the ball and dinner, which tend to be formal functions, together with barbecues, wine-tastings, car rallies, harbour cruises and other informal occasions.

The Society fields teams in as many of the interfaculty sports as possible. Both men's and women's sports are catered for.

Sydney University Agricultural Graduates'

Association

The Sydney University Agricultural Graduates' Association (SUAGA) is a graduate society. All graduates of the Faculty of Agriculture 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

1. (1) There shall be an institute to be known as the Plant Breeding Institute within the Faculty of Agriculture.
   (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. (1) The governing body of the Institute shall be a Council comprising -
   (a) the Vice-Chancellor and Principal, the Dean of the Faculty of Agriculture 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 of Agriculture.
   (2) Each member shall hold office for a period of three years and shall be eligible for reappointment.
3. (1) 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. (1) 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 I.A. 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. (1) 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

1. The name of the Institute shall be the Institute of Advanced Studies within the Faculty of Agriculture.
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 F.H. Loxton Bequest which has been allocated to the Faculty of Agriculture.
   (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 of Agriculture.
   (ii) The Institute shall be responsible for the administration of the scholarship program in the Faculty of Agriculture.
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 appoint-ment 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.

CHAPTER 8

Regulations

Resolutions of the Senate

Constitution of The Faculty of Agriculture

1. The Faculty of Agriculture 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 Departments of Agricultural Chemistry and Soil Science, Agricultural Economics, Animal Science, Crop Sciences and Microbiology and the Plant Breeding Institute;
   (b) two members of the teaching staff in the categories specified in paragraph (a) in each of the Schools of Biological Sciences, Chemistry and Physics and the Departments of Accounting, Econometrics, Economics, Government and Public Administration, and Veterinary Anatomy, nominated annually by the Head of the Department or School concerned;
   (c) the Deans of the Faculties of Science, Veterinary Science and Economics, and the Principal of the Orange Agricultural College;
   (d) the Director of the LA. Watson Grains Research Centre;
   (e) the Director of the Australian Agricultural Health Unit;
   (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 of Agriculture 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 the departments or units 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(e) 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(g) 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

1. The degrees in the Faculty of Agriculture shall be:
   (a) Bachelor of Science in Agriculture (BScAgr)
   (b) Bachelor of Agricultural Economics (BAgrEc)
   (c) Bachelor of Horticultural Science (BHortSc)
   (d) Bachelor of Land and Water Science {BLWSc}
   (e) Bachelor of Resource Economics {BResEc}
   (f) Master of Agriculture (MAgr)
   (g) APEC Master of Sustainable Development (APEC MSDevel}
   (h) Master of Science in Agriculture (MScAgr)
   (i) Master of Agricultural Economics (MAgrEc)
   (j) Doctor of Philosophy (PhD)
   (k) Doctor of Science in Agriculture (DScAgr)
   (1) 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 of Science in Agriculture

(Resolutions commenced in 1995, revised in 1997 and 1998)

1. To qualify for the BScAgr degree,candidates must complete units of study making a total of 192 credit points. In a full time program the normal load will be 24 credit points in each semester 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. A candidate for the degree shall, during the First Year, complete the following units of study:
   Agricultural Entomology 1
   Agricultural Science IA and 1B
   Biology 1 - Agricultural Concepts
   and Biology 1 - Agricultural Systems
   Biometry 1
   Introductory Chemistry 1A and 1B
   or Chemistry 1A and 1B (Advanced)
   Economic Environment of Australian Agriculture 1A and 1B
3. A candidate for the degree shall, during the Second Year, complete the following units of study:
   Agricultural Chemistry 2
   Agricultural Genetics 2
   Agricultural Microbiology 2
   Animal Science 2
   Biometry 2
   Crop Protection 2
   Crop Science 2
   Soil Science 2
4. A candidate for the degree shall, during the Third Year, complete units of study chosen from the following list, such units to have a minimum total value of 48 credit points (as set out in section 9):
   Agribusiness Management 3
   Agricultural Biotechnology 3
   Agricultural Microbiology 3
   Agricultural Systems and Irrigation Science 3*
   Agricultural Systems for Horticultural Science 3*
   Agronomy 3
   Animal Biotechnology 3
   Animal Nutrition 3
   Animal Reproduction 3
   Animal Structure and Function 3A
   Animal Structure and Function 3B
   Applied Marketing 4
   Chemistry and Biochemistry of Ecosystems 3
   Commodity Price Analysis 2
   Experimental Design 3
   Food Chemistry and Biochemistry (Agriculture) 3
   Flower and Nursery Crops 3
   Horticultural Science 3
   Plant Disease 3
   Postharvest Biology and Technology 3
   Production Economics 2
   Rural Environmental Chemistry 3
   Rural Spatial Information Systems 3
   Soil Science 3
   Statistical Modelling 3
   * mutually exclusive
5. A candidate for the degree shall, during the Fourth Year, complete a minimum of 48 credit points as set out in Faculty resolutions in one of the following subject areas made up of the listed units of study:
   Agribusiness 4 (Agribusiness 4A and 4B)
   Agricultural Chemistry 4 (Agricultural Chemistry 4A and 4B)
   Agricultural Economics 4 (Agricultural Economics 4A and 4B)
   Agricultural Entomology 4 (Agricultural Entomology 4A and 4B)
   Agricultural Genetics 4 (Agricultural Genetics 4A and 4B)

Agricultural Microbiology 4 (Agricultural Microbiology 4A and 4B)
Agronomy 4 (Agronomy 4A and 4B)
Biometry 4 (Biometry 4A and 4B)
Cereal Science 4 (Cereal Science 4A and 4B)
Farming Systems 4 (Farming Systems 4A and 4B)
Horticultural Science 4 (Horticultural Science 4A and 4B)
Plant Pathology 4 (Plant Pathology 4A and 4B)
Resource Economics 4 (Resource Economics 4A and 4B)
Soil Science 4 (Soil Science 4A and 4B)
Special Program 4 (Special Program 4A and 4B)
Some variation in units of study required for completion of the degree may be approved by the Dean for exceptionally talented students.

(1) First Class or Second Class Honours, Division One or Division Two may be awarded at graduation.
(2) First Class Honours candidates whose work is, in the opinion of the Board of Examiners, of sufficient merit shall receive a bronze medal.
Before admission to the degree, a candidate shall complete professional experience as prescribed from time to time by the Faculty.

9. The credit points of the units of study listed in sections 2, 3, 4 and 5 are set out in the following table.

Unit of study	Credit points
Agribusiness 4A	24
Agribusiness 4B	24
Agribusiness Management 3	8
Agricultural Biotechnology 3	4
Agricultural Chemistry 2	8
Agricultural Chemistry 4A	24
Agricultural Chemistry 4B	24
Agricultural Economics 4A	24
Agricultural Economics 4B	24
Agricultural Entomology 1	4
Agricultural Entomology 4A	24
Agricultural Entomology 4B	24
Chemistry and Biochemistry of Ecosystems 3	8
Agricultural Systems and Irrigation Science 3	8
Agricultural Systems for Horticultural Science 3	4
Agricultural Genetics 2	6
Agricultural Genetics 4A	24
Agricultural Genetics 4B	24
Agricultural Microbiology 2	6
Agricultural Microbiology 3	8
Agricultural Microbiology 4A	24
Agricultural Microbiology 4B	24
Agricultural Science IA	6
Agricultural Science 1B	6
Agronomy 3	8
Agronomy 4A	24
Agronomy 4B	24
Animal Biotechnology 3	4
Animal Nutrition 3	8
Animal Production 4A	24
Animal Production 4B	24
Animal Reproduction 3	8
Animal Science 2	6
Animal Structure and Function 3A	8
Animal Structure and Function 3B	8
Applied Marketing 4	8
Biology 1 - Agricultural Concepts	4
Biology 1 - Agricultural Systems	5
Biometry 1	5
Biometry 2	6
Biometry 4A	24
Biometry 4B	24
Cereal Science 4A	24
Cereal Science 4B	24
Introductory Chemistry 1A	6
Introductory Chemistry 1B	6
Chemistry 1A (Advanced)	6
Chemistry 1B (Advanced)	6
Commodity Price Analysis 2	8
Crop Protection 2	4
Crop Science 2	6
Economic Environment of Australian Agriculture IA	3
Economic Environment of Australian Agriculture 1B	3
Experimental Design 3	4
Farming Systems 4A	24
Farming Systems 4B	24
Food Chemistry & Biochemistry (Agriculture) 3	8
Flower and Nursery Crops 3	4
Horticultural Science 3	8
Horticultural Science 4A	24
Horticultural Science 4B	24
Plant Disease 3	4
Plant Pathology 4A	24
Plant Pathology 4B	24
Postharvest Biology and Technology 3	4
Production Economics 2	8
Resource Economics 4A	24
Resource Economics 4B	24
Rural Environmental Chemistry 3	4
Rural Spatial Information Systems 3	4
Soil Science 2	6
Soil Science 3	8
Soil Science 4A	24
Soil Science 4B	24
Special Program 4A	24
Special Program 4B	24
Statistical Modelling 3	4

10.(1) Graduates in other faculties of the University of Sydney or of other institutions who are admitted to candidature for the degree of Bachelor of Science in Agriculture, may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.
(2) Students who have completed units of study in another faculty of the University of Sydney and who are admitted to candidature for the degree of Bachelor of Science in Agriculture may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points, provided they have abandoned credit for such units of study in the other faculty.
(3) Students who have completed units of study in another institution and who are admitted to candidature for the degree of Bachelor of Science in Agriculture may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.
(4) In each of the circumstances of the foregoing subsections, where an applicant for admission to candidature has completed units of study which are not comparable with any of the units of study set out in these resolutions, the Dean on behalf of the Faculty may, either instead of or in addition to giving credit for any units of study that is so set out, give credit for such number of unspecified credit points, up to a maximum value of 36 credit points, as the Dean may determine, and all credit points so credited shall, notwithstanding anything contained in these resolutions, count accordingly towards the satisfaction of the requirements of the degree, provided that a candidate may be credited with a maximum of 96 credit points.

11. A candidate shall not be admitted to the degree unless the candidate shall produce a certificate from the Dean of the Faculty that the candidate has completed all the units of study required by the resolutions and has satisfactorily complied with all the other conditions required since the candidate's admission to the degree.

12.(1) A candidate who re-enrols in a unit of study which the candidate has previously failed to complete shall, unless exempted by the Faculty, attend all lectures and other classes and complete all written and other work prescribed for the unit of study.

(2) A candidate in the Third Year may choose any of the elective units of study for which there is no prerequisite unit of study or for which the prerequisite has been completed, provided that the exigencies of the timetable permit the taking of the units of study chosen by the candidate.

Transitional provisions

13.(1) A candidate who was enrolled for the degree prior to 1 January 1995 and who has not completed the academic requirements by 31 March 1998, or such later date as the Dean in any case may determine, shall complete the requirements for the degree in accordance with these resolutions.

(2) In the Case of any candidates who might be prejudiced by any change in the curriculum the Dean of the Faculty may, subject to any resolutions of the Faculty, give such directions as to units to be completed and give such credit for units of study already completed as the circumstances may require.

Bachelor of Horticultural Science

1. To qualify for the BHortSc degree, candidates must complete units of study making a total of 192 credit points. In a full time program the normal load will be 24 credit points in each semester 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. A candidate for the degree shall, during the First Year, complete the following units of study:
   Agricultural Entomology 1
   Biology 1 - Agricultural Concepts
   and Biology 1 - Agricultural Systems
   Biometry 1
   Introductory Chemistry 1A and 1B
   or Chemistry 1A and 1B (Advanced)
   Economic Environment of Australian Agriculture A and B
   Horticultural Science IA and 1B
3. A candidate for the degree shall, during the Second Year, complete the following units of study:
   Agricultural Chemistry 2
   Agricultural Genetics 2
   Agricultural Microbiology 2
   Biometry 2
   Crop Protection 2
   Crop Science 2
   Horticultural Science 2
   Soil Science 2
4. A candidate for the degree shall, during the Third Year, complete the unit of study Horticultural Science 3 together with units chosen from the following list, such units to have a minimum total value of 40 credit points (as set out in Section 9):
   Agribusiness Management 3
   Agricultural Biotechnology 3
   Agricultural Systems for Horticultural Science 3
   Agronomy 3
   Applied Marketing 4
   Chemistry and Biochemistry of Ecosystems 3
   Experimental Design 3
   Flower and Nursery Crops 3
   Food Chemistry and Biochemistry (Agriculture) 3
   Plant Disease 3
   Postharvest Biology and Technology 3
   Production Economics 2
   Rural Environmental Chemistry 3
   Soil Science 3
5. A candidate for the degree shall, during the Fourth Year, complete a minimum of 48 credit points as set out in Faculty resolutions in the subject area Horticultural Science 4 made up of the listed units of study
6. Some variation in courses required for completion of the degree may be approved by the Dean for exceptionally talented students.
7. (1) First Class or Second Class Honours, Division One or Division Two may be. awarded at graduation.
   (2) First Class Honours candidates whose work is, in the opinion of the Board of Examiners, of sufficient merit, shall receive a bronze medal.
8. Before admission to the degree, a candidate shall complete professional experience as prescribed from time to time by the Faculty.
9. The credit points of the units of study listed in sections 2, 3,4 and 5 are set out in the following table:

Unit of study	Credit points
Agribusiness Management 3	8
Agricultural Biotechnology 3	4
Agricultural Chemistry 2	8
Agricultural Entomology 1	4
Chemistry and Biochemistry of Ecosystems 3	8
Agricultural Genetics 2	6
Agricultural Microbiology 2	6
Applied Marketing 4	8
Agricultural Systems for Horticultural Science 3	4
Agronomy 3	8
Biology 1 - Agricultural Concepts	4
Biology 1 - Agricultural Systems	5
Biometry 1	5
Biometry 2	6
Introductory Chemistry 1A	6
Introductory Chemistry 1B	6
Chemistry 1A (Advanced) 6	
Chemistry 1B (Advanced) 6	
Crop Protection 2	4
Crop Science 2	6
Economic Environment of Australian Agriculture IA	3
Economic Environment of Australian Agriculture 1B	3
Experimental Design 3	4
Food Chemistry & Biochemistry (Agriculture) 3	8
Flower and Nursery Crops 3	4
Horticultural Science IA	6
Horticultural Science 1B	6
Horticultural Science 2	6
Horticultural Science 3	8
Horticultural Science 4A	24
Horticultural Science 4B	24
Plant Disease 3	4
Postharvest Biology and Technology 3	4
Production Economics 2	8
Rural Environmental Chemistry 3	4
Soil Science 2	6
Soil Science 3	8
Statistical Modelling 3	4

Other units in the BScAgr degree with the permission of the Dean and Head of Department

10.(1) Graduates in other faculties of the University of Sydney or of other institutions who are admitted to candidature for the degree of Bachelor of Horticultural Science, may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

(2) Students who have completed units of study in another faculty of the University of Sydney or another degree in the Faculty of Agriculture and who are admitted to candidature for the degree of Bachelor of Horticultural Science may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points, provided they have abandoned credit for such units of study in the other faculty or degree.

(3) Students who have completed units of study in anomer institution and who are admitted to candidature for the degree of Bachelor of Horticultural Science may be granted credit for such units of study as tile Dean on behalf of the

Faculty may determine, up to a maximum value of 96 credit points.
(4) In each of the circumstances of the foregoing subsections, where an applicant for admission to candidature has completed units of study which are not comparable with any of the units of study set out in these resolutions, the Dean on behalf of the Faculty may, either instead of or in addition to giving credit for any unit of study that is so set out, give credit for such number of unspecified credit points, up to a maximum value of 36 credit points, as the Dean may determine, and all credit points so credited shall, notwithstanding anything contained in these resolutions, count accordingly towards the satisfaction of the requirements of the degree, provided that a candidate may be credited with a maximum of 96 credit points

11.(1) A candidate shall not be admitted to the degree unless the candidate shall produce a certificate from the Dean of the Faculty that the candidate has completed all the units of study required by the resolutions and has satisfactorily complied with all the other conditions required since the candidate's admission to the degree.

12.(1) A candidate who re-enrols in a unit of study which the candidate has previously failed to complete shall, unless exempted by the Faculty, attend all lectures and other classes and complete all written and other work prescribed for the unit of study.
(2) A candidate in the Third Year may choose any of the elective units of study for which there is no prerequisite unit of study or for which the prerequisite has been completed, provided that the exigencies of the timetable permit the taking of the courses chosen by the candidate.

Bachelor of Land and Water Science

1. To qualify for the BLWSc degree, candidates must complete units of study making a total of 192 credit points. In a full-time program the normal load will be 24 credit points in each semester 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. A candidate for the degree shall, during the First Year, complete the following units of study:
   BIOL1001 Concepts in Biology
   BIOM1002 Environmetrics 1
   CHEM1001 Introductory Chemistry 1A, and CHEM1002 Introductory Chemistry 1B
   or CHEM1101 Chemistry 1A, and CHEM1102 Chemistry 1B
   or CHEM1901 Chemistry 1A (Advanced), and CHEM 1902 Chemistry 1B (Advanced)
   ENVI1001 Global Geology
   ENVI1002 Geomorphic Environments and Change
   LWSC1001 Land and Water Science IA
   LWSC1002 Land and Water Science 1B
3. A candidate for the degree shall, during the Second Year, complete the following units of study:
   AGCH2002 Agricultural Chemistry 2
   BIOL2101 Animals A Theory
   BIOL2102 Animals B Theory
   BIOL2004 Plant Ecology and Diversity
   BIOM2002 Environmetrics 2
   GEOG2302 Fluvial Geomorphology and Hydrology
   LWSC2001 Land and Water Science 2A
   LWSC2002 Land and Water Science 2B
   MICR2003 Theoretical Microbiology A
   SOIL2003 Soil Science 2
4. A candidate for the degree shall, during the Third Year, complete the following units of study:
   AGCH3012 Rural Environmental Chemistry 3
   AGRO3001 Vegetation and Water Resources 3
   AGCH3014 Chemistry and Biochemistry of Ecosystems 3LWS
   ENVI3002 Environmental Assessment
   LWSC3001 Hydrology and Catchment Management
   RSIS3001 Rural Spatial Information Systems 3
   SOIL 3003 Soil Resources and Conservation 3
   together with 12 credit points of electives chosen from units offered by the Faculties of Agriculture, Economics, Engineering, Science and the Orange Agricultural College and approved by the course co-ordinator in relevant disciplines - ecology, land science, water science, biophysical modelling, socioeconomics and political systems.
5. A candidate for the degree shall, during the Fourth Year, complete the following units of study:
   AGEC4027 Introductory Land and Water Economics 4
   ENVI 3003 Environmental Law and Planning
   LWSC4001 Planning and Communication Policy
   LWSC4002 Research Project 4
   together with 12 credit points of electives chosen from units offered by the Faculties of Agriculture, Economics, Engineering, Science and the Orange Agricultural College and approved by the course co-ordinator in relevant disciplines - ecology, land science, water science, biophysical modelling, socioeconomics and political systems.
6. Some variation in units of study required for completion of the degree may be approved by the Dean for exceptionally talented students.
7. (1) First Class or Second Class Honours, Division One or Division Two may be awarded at graduation.
   (2) First Class Honours candidates whose work is, in the opinion of the Board of Examiners, of sufficient merit shall receive a bronze medal.
8. The credit points of the units of study listed in sections 2, 3, 4 and 5 are set out in the following table

Unit of study	Credit points
AGCH2002 Agricultural Chemistry 2	8
AGCH3012 Rural Environmental Chemistry 3	4
AGCH3014 Chemistry and Biochemistry of Ecosystems 3LWS	4
AGEC4027 Introductory Land and Water Economics 4	4
AGRO3001 Vegetation and Water Resources 3	8
BIOL1001 Concepts in Biology	6
BIOL2004 Plant Ecology and Diversity	8
BIOL2101 Animals A Theory	4
BIOL2102 Animals B Theory	4
BIOM1002 Environmetrics 1	6
BIOM2002 Environmetrics 2	4
CHEM1001 Introductory Chemistry 1A	6
CHEM1002 Introductory Chemistry 1B	6
CHEM1101 Chemistry 1A	6
CHEM1102 Chemistry 1B	6
CHEM1901 Chemistry 1A (Advanced)	6
CHEM1902 Chemistry 1B (Advanced)	6
ENVI1001 Global Geology	6
ENVI1002 Geomorphic Environments and Change	6
ENVI3002 Environmental Assessment	4
ENVI3003 Environmental Law and Planning	4
GEOG2302 Fluvial Geomorphology and Hydrology	6
LWSC1001 Land & Water Science 1A	6
LWSC1002 Land & Water Science 1B	6
LWSC2001 Land and Water Science 2A	2
LWSC2002 Land and Water Science 2B	2
LWSC3001 Hydrology and Catchment Management	4
LWSC4001 Planning and Communication Policy	4
LWSC4002 Research Project 4	24
MICR2003 Theoretical Microbiology A	4
RSIS3001 Rural Spatial Information Systems 3	4
SOIL2003 Soil Science 2	6
SOIL3003 Soil Resources and Conservation 3	8

Other units approved by the course co-ordinator in relevant disciplines - ecology, land science, water science, biophysical modelling, socioeconomics and political systems

9. (1) Graduates in other faculties of the University of Sydney or of other institutions who are admitted to candidature for the degree of Bachelor of Land and Water Science, may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

   (2) Students who have completed units of study in another faculty of the University of Sydney and who are admitted to candidature for the degree of Bachelor of Land and Water Science may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points, provided they have abandoned credit for such units of study in the other faculty.

   (3) Students who have completed units of study in another institution and who are admitted to candidature for the degree of Bachelor of Land and Water Science may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

   (4) In each of the circumstances of the foregoing subsections, where an applicant for admission to candidature has completed units of study which are not comparable with any of the units of study set out in these resolutions, the Dean on behalf of the Faculty may, either instead of or in addition to giving credit for any units of study that is so set out, give credit for such number of unspecified credit points, up to a maximum value of 36 credit points, as the Dean may determine, and all credit points so credited shall, notwithstanding anything contained in these resolutions, count accordingly towards the satisfaction of the requirements of the degree, provided that a candidate may be credited with a maximum of 96 credit points.

10. A candidate shall not be admitted to the degree unless the candidate shall produce a certificate from the Dean of the Faculty that the candidate has completed all the units of study required by the resolutions and has satisfactorily complied with all the other conditions required since the candidate's admission to the degree.

11. (1) A candidate who re-enrols in a unit of study which the candidate has previously failed to complete shall, unless exempted by the Faculty, attend all lectures and other classes and complete all written and other work prescribed for the unit of study.

    (2) A candidate in the Third or Fourth Year may choose any of the elective units of study for which there is no prerequisite unit of study or for which the prerequisite has been completed, provided that the exigencies of the timetable permit the taking of the units of study chosen by the candidate.

Bachelor of Agricultural Economics

1. To qualify for the BAgrEc degree, candidates must complete units of study making a total of 192 credit points. With full-time study, the program entails 8 semesters with an annual load of 48 credit points. 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. A candidate for the degree shall, during the First Year, complete the following units of study:
   Agricultural Economics IA and 1B
   Econometrics IA and 1B
   Introductory Microeconomics
   Introductory Macroeconomics
   and 12 units from Table 1 attached to these resolutions.
3. A candidate for the degree shall, during the Second Year, complete the following units of study:
   Applied Commodity Modelling 2
   Commodity Price Analysis 2
   Intermediate Microeconomics
   Intermediate Macroeconomics
   Production Economics 2
   and a minimum of 12 credit points from Tables 1 or 2 attached to these resolutions.
4. A candidate for the degree shall, during the Third Year, complete the following units of study:
   Agricultural and Resource Policy 3
   Agribusiness Management 3
   Research Methods 3
   Two units of Level 3 Economics (8 credit points each)
   and a minimum of 12 credit points from Table 2 attached to these resolutions.
5. A candidate for the degree shall, during the Fourth Year, complete the following units of study.
   Research Project 4
   Contemporary Issues 4A
   Contemporary Issues 4B
   and a minimum of 24 credit points from
   Agricultural Finance and Risk Management 4
   Applied International Trade 4
   Applied Marketing 4
   Natural Resource Economics 4
   Quantitative Planning Methods 4
   Special Topics in Agricultural and Resource Economics 4
   [for 2000 only, 16 credit points from Level 4000 AGEC units] and [for 2000 only] 8 credit points from Table 2 or 8 credit points from Level 4000 AGEC units with the approval of the Head of the Department of Agricultural Economics.
6. A candidate may count no more than 24 credit points from Table 1 towards the degree and only one of each of the following pairs of units of study: Accounting IA or Financial Accounting Concepts; Accounting 1B or Management Accounting Concepts; and Applied Commodity Modelling 2(8 cp) or Econometrics IIB.
7. Some variation in units of study required for completion of the degree may be approved by the Dean for exceptionally talented students.
8. (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, in the opinion of the Board of Examiners, of sufficient merit shall receive a bronze medal.
9. Before admission to the degree, a candidate shall complete professional experience as prescribed from time to time by the Faculty.
10. The credit points of the units of study listed in sections 2, 3, 4 and 5 are set out in the following table:

Unit of study	Credit points
Accounting IA	6
Accounting 1B	6
Accounting (any level 2 semester unit)	8
Accounting (any level 3 semester unit)	8
Agribusiness Management 3	8
Agricultural Economics IA	6
Agricultural Economics 1B	6
Agricultural Finance and Risk Management 4	4
Agricultural and Resource Policy 3	8
Agricultural Science IA	6
Agricultural Science 1B	6
Agronomy 3	8
Animal Science 2AE	4
Applied Commodity Modelling 2	4
Applied Commodity Theory 2	2
Applied Commodity Practical 2	2
Applied International Trade 4	8
Applied Marketing 4	8
Asian Studies 1	8

Asian Studies 2	8
Asian Studies 3	8
Biology 1001	6
Biology 1002 or 1003	6
Biology 1901	6
Biology 1902 or 1903	6
Commercial Law (any level 2 semester unit)	8
Commercial Law (any level 3 semester unit)	8
Commercial Transactions A	6
Commercial Transcations B	6
Commodity Price Analysis 3	8
Contemporary Issues 4A	4
Contemporary Issues 4B	4
Crop and Pasture Agronomy 3	6
Econometrics IA	6
Econometrics 1B	6
Econometrics IIA	8
Econometrics IIB	8
Econometrics (any level 3 semester unit)	8
Economic History (any level 2 semester unit)	8
Economics (any level 3 semester unit)	8
Finance (any level 2 semester unit)	8
Finance (any level 3 semester unit)	8
Financial Accounting Concepts	6
Flower and Nursery Crops 3	4
Geography (any level 1 semester unit)	6
Geography (any level 2 semester unit)	8
Geography (any level 3 semester unit)	12
Government (any level 1 semester unit)	6
Government (any level 2 semester unit)	8
Horticultural Science 3	8
Introductory Macroeconomics	6
Introductory Microeconomics	6
Intermediate Macroeconomics	8
Intermediate Microeconomics	8
Management Accounting Concepts	6
Marketing (any level 2 semester unit)	8
Marketing (any level 3 semester unit)	8
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
Modem Language (any level 1)	6
Modern Language (any level 2/3)	4/8
Natural Resource Economics 4	8
Production Economics 2	8
Quantitative Planning Methods 4	4
Research Methods 3	4
Research Project 4	16
Special Topics in Agricultural and Resource Economics	8

11.(1) Graduates in other faculties of the University of Sydney or of other institutions who are admitted to candidature for the degree of Bachelor of Agricultural Economics, may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

(2) Students who have completed units of study in another faculty of the University of Sydney and who are admitted to candidature for the degree of Bachelor of Agricultural Economics may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points, provided they have abandoned credit for such units of study in the other faculty.

(3) Students who have completed units of study in another institution and who are admitted to candidature for the degree of Bachelor of Agricultural Economics may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a value of 96 credit points.

(4) In each of the circumstances of the foregoing subsections, where an applicant for admission to candidature has completed courses which are not comparable with any of the units of study set out in these resolutions, the Dean on behalf of the Faculty may, either instead of or in addition to giving credit for any unit of study that is so set out, give credit for such number of unspecified credit points, up to a maximum value of 36 credit points, as the Dean may determine, and all credit points so credited shall, notwithstanding anything contained in these resolutions, count accordingly towards the satisfaction of the requirements of the degree, provided that a candidate may be credited with a maximum of 96 credit points.

12. A candidate shall not be admitted to the degree unless the candidate shall produce a certificate from the Dean of the Faculty that the candidate has completed all the units of study required by the resolutions and has satisfactorily complied with all the other conditions required since the candidate's admission to the degree.

13.(1) A candidate who re-enrols in a unit of study which the candidate has previously failed to complete shall, unless exempted by the Faculty, attend all lectures and other classes and complete all written and other work prescribed for the unit of study.

(2) A candidate in the Second or Third Year may choose any of the elective units of study for which there is no prerequisite unit of study or for which the prerequisite has been completed, provided that the exigencies of the timetable permit the taking of the units of study chosen by the candidate.

Transitional provisions

14.(1) A candidate who was enrolled for the degree prior to 1 January 1998 and who has not completed the academic requirements by 31 March 1998 shall complete those requirements in accordance with these resolutions.

(2) Such a candidate may be permitted by the Faculty to count towards the degree a unit of study other than those listed in the preceding sections of these resolutions and their attached tables; and may, with the approval of the Faculty, satisfy the academic requirements of the degree by completing 196 credit points of coursework chosen from or credited towards these resolutions.

Table 1

Unit of study	Credit points	Prerequisites	Corequisites
No more than 24 credit points from this table : may count towards the degree.			
Accounting IA♦	6	-	-
Accounting 1B	6	Accounting IA	-
Agricultural Science lA and 1B	6/6	-	
Biology (level 1 units) 6/6	-		
Commercial Transactions A	6	-	-
Commercial Transactions B	6	Commercial Transactions A	-
Financial Accounting Concepts*	6	-	
Geography (level 1 units) 6/6	-	-	
Government (level 1 units) 6/6	-		
Horticultural Science IA and 1B	6/6	-	-
Management Accounting Concepts*	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	-	
Modern Language (level 1 units) 6	-		

♦Cannot be counted with Accounting IA & 1B.

Table 2

Unit of study	Credit points	Prerequisites	Corequisites
Accounting (any level 2 unit) 8		*Consult Faculty of Economics and Business Handbook*	
Accounting (any level 3 unit) 8	"		
Agronomy 3	8	Crop and Pasture Agronomy 2	-
Animal Science 2AE	4	-	-
Asian Studies 1	8		
Asian Studies 2	8	Asian Studies 1	-
Asian Studies 3	8	Asian Studies 2	-
Commercial Law (any level 2 unit) 8		*Consult Faculty of Economics and Business Handbook*	
Commercial Law (any level 3 unit) 8	"		
Crop and Pasture Agronomy 2	6	-	
Econometrics IIA	8	Econometrics IA and 1B	
Econometrics IIB	8	-	Econometrics IIA
Econometricst (any level 3 unit) 8		*Consult Faculty of Economics and Business Handbook*	
Economic History (any level 2 unit) 8	it		
Economics (any level 3 unit) 8	"		
Finance (any level 2 unit) 8	"		
Finance (any level 3 unit) 8	"		
Flower and Nursery Crops 3	4	Crop and Pasture Agronomy 2	-
Geography (any level 2 unit) 8		*Consult Faculty of Science Handbook*	
Geography (any level 3 unit) 12	"		
Government (any level 2 unit) 8		*Consult Faculty of Economics and Business Handbook*	
Horticultural Science 3	8	Crop and Pasture Agronomy 2	-
Marketing (any level 2 unit) 8		*Consult Faculty of Economics and Business Handbook*	
Marketing (any level 3 unit) 8	"		
Modern Language (level 2/3 units) 4/8		*Consult Faculty of Arts Handbook*	
Special Topics in Agricultural and Resource Economics	8	-	

Units of study from the BScAgr or BHortSc degrees, subject to the approval of the Head of Department of Agricultural Economics and the Head of the Department concerned.

tSubject to the approval of the Head of Department of Agricultural Economics.

Bachelor of Resource Economics

1. To qualify for the BResEc degree, candidates must complete units of study making a total of 192 credit points. With full-time study, the program entails 8 semesters with an annual load of 48 credit points. 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. A candidate for the degree shall, during the First Year, complete the following units of study:
   AGEC1031 Resource Economics 1
   BIOL1001 Concepts in Biology and BIOL1002 Living Systems
   or BIOL1901 Concepts in Biology (Advanced) and BIOL1002 Living Systems (Advanced)
   or LWSC1001 Land & Water Science IA, and LWSC1002 Land & Water Science 1B
   CHEM1001 Introductory Chemistry 1A & CHEM1002 Introductory Chemistry 1B
   orCHEMllOl ChemistrylA & B CHEM1102 Chemistry 1B
   or CHEM1901 Chemistry 1A (Advanced) & CHEM1902 Chemistry 1B (Advanced)
   ECON1001 Introductory Microeconomics
   MATH1001 Differential Calculus *and* MATH1002 Linear Algebra *and* MATH1003 Integral Calculus and Modelling *and* MATH1005 Statistics
   or (Advanced levels) MATH1901/1902/1903/1905
3. A candidate for the degree shall, during the Second Year, complete the following units of study:
   AGEC2001 Commodity Price Analysis 2
   AGEC2003 Production Economics 2
   AGEC2005 Applied Commodity Modelling 2
   ECON1002 Introductory Macroeconomics
   ECON2001 Intermediate Microeconomics
   GEOG2001 Processes in Geomorphology
   GEOG2302 Fluvial Geomorphology and Hydrology
   or GEOG2002 Fluvial and Coastal Geography
4. A candidate for the degree shall, during the Third Year, complete the following units of study:
   AGEC3002 Agricultural and Resource Policy 3
   AGEC3031 Resource Economics 3
   ECON2002 Intermediate Macroeconomics
   ECON3000 level unit (option)
   together with 16 credit points of electives chosen from Table 1 below.
5. A candidate for the degree shall, during the Fourth Year, complete the following units of study:
   AGEC4031 Resource Economics Project 4
   AGEC4041 Research Methods 4
   ECON3000 level unit (option)
   ENVI4803 Environmental Law
   together with at least 12 credit points of units chosen from Table 3 below
   and an additional unit(s) if necessary, chosen from Table 2, for a total of 48 credit points.
6. Some variation in units of study required for completion of the degree may be approved by the Dean for exceptionally talented students.
7. (1) First Class or Second Class Honours, Division One or Division Two may be awarded at graduation.
   (2) First Class Honours candidates whose work is, in the opinion of the Board of Examiners, of sufficient merit shall receive a bronze medal.
8. Before admission to the degree, a candidate shall complete professional experience as prescribed from time to time by the Faculty.
9. The credit points of the units of study listed in sections 2, 3, 4 and 5 are set out in the following table.

Unit of study	Credit points
AGCH2000 Agricultural Chemistry (any level 2 unit)	8
AGCH3000 Agricultural Chemistry (any level 3 unit)	4/8/12
AGEC1031 Resource Economics 1	6
AGEC3031 Resource Economics 3	8
AGEC2001 Commodity Price Analysis 2	8
AGEC2003 Production Economics 2	8
AGEC2005 Applied Commodity Modelling 2	4
AGEC3002 Agricultural and Resource Policy 3	8
AGEC3000 Agricultural Economics (any other level 3 unit)	8
AGEC4000 Agricultural Economics (any other level 4 unit)	4/8
AGEC4031 Resource Economics Project 4	12
AGEC4032 Methods of Non-market Valuation 4	4
AGEC4033 Minerals and Energy Economics 4	4
AGEC4034 Renewable Resource Economics 4	4
AGEC4035 Environmental Economics 4	4
AGEC4036 Water Economics 4	4
AGEC4041 Research Methods 4	4
AGRO3001 Vegetation and Water Resources 3	4
ANSC2003 Animal Science 2AE	4
BIOL1001 Concepts in Biology	6
BIOL1002 Living Systems	6
BIOL1901 Concepts in Biology (Advanced)	6
BIOL1902 Living Systems (Advanced)	6
BIOL2000 Biology (any level 2 unit)	4/8
BIOL3000 Biology (any level 3 unit)	12
BIOM2001 Biometry 2	6
BIOM2002 Environmetrics 2	4
BIOM3002 Experimental Design 2	4
BIOM3003 Statistical Modelling 2	4
CHEM2000 Chemistry (any level 2 unit)	8
CHEM3000 Chemistry (any level 3 unit)	12
CHEM1001 Introductory Chemistry 1A	6
CHEM1002 Introductory Chemistry 1B	6
CHEM1101 Chemistry 1A	6
CHEM1102 Chemistry 1B	6
CHEM1901 Chemistry 1A (Advanced)	6
CHEM1902 Chemistry 1B (Advanced)	6
CROP2001 Crop Science 2	6
CROP3002 Agricultural Systems and Irrigation Science 3	8
CROP3003 Agricultural Systems for Horticultural Science 3	4
ECON1001 Introductory Microeconomics	6
ECON1002 Introductory Macroeconomics	6
ECON2001 Intermediate Microeconomics	8
ECON2002 Intermediate Macroeconomics	8
ECON3000 Economics (any level 3 unit)	8
ENVI2000 Environmental Science (any level 2 unit)	8
ENVI3000 Environmental Science (any level 3 unit)	4/12
ENVI4803 Environmental Law and Planning	4
GENE2001 Agricultural Genetics 2	6
GEOG2001 Processes in Geomorphology	8
GEOG2002 Fluvial and Coastal Geography	8
GEOG2302 Fluvial Geomorphology and Hydrology	6
GEOG2000 Geography (any other level 2 unit)	8
GEOG3000 Geography (any level 3 unit)	12
GEOL2000 Geology (any level 2 unit)	4/8
GEOL3000 Geology (any level 3 unit)	4/8/12
GEOP3000 Geophysics (any level 3 unit)	4
HORT3001 Horticultural Science 3	8
LWSC2001 Land and Water Science 2A	4
LWSC2002 Land and Water Science 2B	4
LWSC3001 Hydrology and Catchment Management	4
MATH1001/1002/1003/1005 (each)	3
MATH1901/1902/1903/1905 (each)	3
MATH2000 (any level 2 unit)	4
MATH3000 (any level 3 unit)	4
MARS2000 Marine Science (any level 2 unit)	4
MARS3000 Marine Science (any level 3 unit)	12
RSIS3001 Rural Spatial Information Systems 3	4
SOIL2000 Soil Science (any level 2 unit)	8
SOIL3000 Soil Science (any level 3 unit)	8/12

10.(1) Graduates in other faculties of the University of Sydney or of other institutions who are admitted to candidature for the degree of Bachelor of Resource Economics, may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

(2) Students who have completed units of study in another faculty of the University of Sydney and who are admitted to candidature for the degree of Bachelor of Resource Economics may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points, provided they have abandoned credit for such units of study in the other faculty.

(3) Students who have completed units of study in another institution and who are admitted to candidature for the degree of Bachelor of Resource Economics may be granted credit for such units of study as the Dean on behalf of the Faculty may determine, up to a maximum value of 96 credit points.

(4) In each of the circumstances of the foregoing subsections, where an applicant for admission to candidature has completed units of study which are not comparable with any of the units of study set out in these resolutions, the Dean on behalf of the Faculty may, either instead of or in addition to giving credit for any units of study that is so set out, give credit for such number of unspecified credit points, up to a maximum value of 36 credit points, as the Dean may determine, and all credit points so credited shall, notwithstanding anything contained in these resolutions, count accordingly towards the satisfaction of the requirements of the degree, provided that a candidate may be credited with a maximum of 96 credit points.

11. A candidate shall not be admitted to the degree unless the candidate shall produce a certificate from the Dean of the Faculty that the candidate has completed all the units of study required by the resolutions and has satisfactorily complied with all the other conditions required since the candidate's admission to the degree.

12.(1) A candidate who re-enrols in a unit of study which the candidate has previously failed to complete shall, unless exempted by the Faculty, attend all lectures and other classes and complete all written and other work prescribed for the unit of study.

(2) A candidate in the Second or Third Year may choose any of the elective units of study for which there is no prerequisite unit of study or for which the prerequisite has been completed, provided that the exigencies of the timetable permit the taking of the units of study chosen by the candidate.

Table 1: Units from which Third Year students take electives

Units in the following discipline areas (Level 2 unless otherwise specified):

- agricultural economics (Level 3)
- agricultural chemistry
- animal science
- biology
- chemistry
- crop sciences
- economics (Level 2 or 3)
- environmental science
- geography (Level 2 or 3)
- geology
- land and water science
- mathematics
- marine science
- resource economics (Level 3)
- soil science.

Table 2: Units from which Fourth Year students take electives

Units 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 sciences
- economics
- environmental science
- geography
- geology
- land and water science
- mathematics
- marine science
- resource economics (Level 3 or 4)
- soil science.

Table 3: Resource Economics units from which Fourth Year students take electives

AGEC4032 Methods of Non-market Valuation 4
AGEC4033 Minerals and Energy Economics 4
AGEC4034 Renewable Resource Economics 4
AGEC4035 Environmental Economics 4
AGEC4036 Water Economics 4

Discontinuation of enrolment and re-enrolment after discontinuation - undergraduate

All Faculties and Boards of Studies

1. A candidate for a degree of Bachelor who ceases attendance at classes must apply to the Faculty or Board of Studies concerned and will be presumed to have discontinued enrolment from the date of application, 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 for a degree of Bachelor who at any time during the first year of attendance discontinues enrolment in all units of study shall not be entitled to re-enrol for that degree unless the Faculty or Board of Studies concerned has granted prior permission to re-enrol or the person is re-selected for admission to candidature for that degree.
3. Subject to subsections (i) and (ii) of section 1, no candidate for a degree of Bachelor may discontinue enrolment in a unit of study or year after the end of lectures in that unit or year.
4. The Dean, Pro-Dean or an Associate Dean of a Faculty or the Chairperson of a Board of Studies, may act on behalf of that Faculty or Board of Studies in the administration of these resolutions unless the Faculty or Board of Studies concerned decides otherwise.

Withdrawal from full-year and March Semester units of study

5. A candidate for a degree of Bachelor who discontinues enrolment in a full-year or March Semester unit of study on or before 31 March in that year shall be recorded as having withdrawn from that unit.

Withdrawal from July Semester units of study

6. 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.

All Faculties and Boards of Studies except the Faculty of Engineering

Discontinuation

7. (1) A discontinuation of enrolment in a unit of study shall be recorded as 'Discontinued with Permission' when the discontinuation occurs after the relevant withdrawal period, and

(a) on or before the Friday of the first week of July Semester for a full-year unit of study, or

(b) up to the last day of the seventh week of teaching in a one semester unit of study.

(2) A discontinuation of enrolment in a unit of study shall be recorded as 'Discontinued' when the discontinuation occurs

(a) after the Friday of the first week of July Semester for a full-year course, or

(b) after the last day of the seventh week of teaching in a one semester course.

(3) Notwithstanding paragraph (2) the Dean, Pro-Dean or an Associate Dean of the Faculty or Chairperson of the Board of Studies concerned may determine that a discontinuation of enrolment should be recorded as 'Discontinued with Permission' on the grounds of serious ill-health or misadventure.

Resolutions of the Faculty - undergraduate candidatures

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 Office within one week after attendance is resumed.

In the BScAgr and BHortSc degrees

1. A candidate who has successfully completed a unit of study prescribed in the resolutions may be granted exemption by the Faculty from taking the course of instruction and examination in such unit again.
2. A candidate who has not completed all units of study in the First or the Second Year may be permitted by the Faculty to take one or more units of study from the next year, provided that the total credit point load should not normally exceed 56 credit points.
3. A candidate in the Third Year may be granted permission by the Faculty to take one or more Fourth Year options, provided that the candidate's complete Fourth Year course of study is approved by the Head of Department who will supervise the candidate's work in trie Fourth Year.
4. A candidate who has not completed all units of study in the Third Year may, in circumstances approved by the Faculty, be granted permission to enrol in the Fourth Year together with the remaining unit or units of study of the Third Year provided such units do not exceed eight credit points.

In the BLWSc degree

1. A candidate who has successfully completed a unit of study prescribed in the resolutions may be granted exemption by the Faculty from taking the course of instruction and examination in such unit again.
2. A candidate who has not completed all units of study in the First, Second or Third Year may be permitted by the Faculty to enrol in one or more units of study from the next year, provided that the total credit point load should not normally exceed 56 credit points.

In the BAgrEc and BResEc degrees

1. A candidate who has unsuccessfully attempted a unit of study prescribed in the resolutions, but who has satisfactorily completed one or more components of that unit, may be granted an exemption by the Faculty from taking parts of the instruction or parts of the assessment in the unit again.
2. A candidate who has not completed all units of study prescribed in the resolutions for the First, Second or Third Year may be permitted by the Faculty to enrol in one or more units of study from the next year, provided that the total credit point load in a semester should not normally exceed 32 credit points.
3. Students will not usually be permitted to enrol in units from the next academic year when there are suitable units on offer that would contribute to fulfilling the requirements for their current academic year.

More Undergraduate Resolutions are found under Other Faculty Information.

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 one of the following departments:
   Department of Agricultural Chemistry and Soil Science
   Department of Animal Science
   Department of Crop Sciences
   Department of Microbiology
   The Plant Breeding Institute.
   (2) A candidate for the degree of Master of Agricultural Economics shall proceed in the Department of Agricultural Economics.
   (3) A candidate for the degree of Master of Agriculture shall proceed in any of the departments in the Faculty or in an interdisciplinary program approved by the Faculty.

Admission to candidature

3. (1) The Faculty of Agriculture 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 Science in Agriculture or the degree of Bachelor of Agricultural Economics 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 Science in Agriculture or the degree of Master of Agricultural Economics if the candidate has ceased to be a candidate for the other degree, and the Faculty may reduce the minimum and maximum periods of candidature accordingly.

Appointment of supervisor

6. The Faculty shall appoint a member of the full-time academic or research staff of the Department 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 56 credit points from units of study approved from time to time by the Faculty.

Progress

8. (1) 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. (1) 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

10. The Faculty shall appoint at least two examiners for a thesis.

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 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
(1) Plant Breeding
(mlPlant 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 at the University of Sydney.

Admission to candidature

3. (1) The Faculty of Agriculture 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. (1) 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. (1) 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 one of the following departments:
   Department of Agricultural Chemistry and Soil Science
   Department of Animal Science
   Department of Crop Sciences
   Department of Microbiology.
   (2) A candidate for the Graduate Diploma in Agricultural Economics shall proceed in the Department of Agricultural Economics.

Admission to candidature

3. (1) The Faculty of Agriculture 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

7. 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 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
   (j) Plant Protection
   (k) Soil Science
   (1) Turf Management.

Resolutions of the Faculty - Postgraduate Candidatures

Eligibility for admission

1. An applicant for admission to candidature for a research degree shall -
   (a) be a Bachelor of Agricultural Economics or Bachelor of Science in Agriculture 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, be a Bachelor of Agricultural Economics or Bachelor of Science in Agriculture 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, bom 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.
(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 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

ll. 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) for up 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 acid-free 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. (1) 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 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 concurs[1]; or
(c) the Board of Postgraduate Studies unanimously accepts a recommendation from the Head of the Department 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 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 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. 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

1. In order to ensure that the copies which are retained in the University are as free of error as possible, the Board of Postgraduate Studies may award the degree subject to emendation even if the Head of the Department has not recommended the correction of minor errors which examiners have listed. To avoid any confusion as to what is required, the Board of Postgraduate Studies will draw to the attention of the Head of the Department the emendations it requires.

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 Office within one week after attendance is resumed.

Faculty Resolutions for APEC MSDevel

Eligibility for admission

1. An apphcant 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 with Permission' 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 with Permission'.

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 Departments (or nominees).

General University information

See also the Glossary for administrative information relating to particular terms.

Admissions Office

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 4117 or+61 2 9351 4118
Fax: +61 2 9351 4869
Email: admissions@records.usyd.edu.au
The Admissions Office is responsible for overseeing the distribution of offers of 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 +61 2 9351 3611 for more information. For enquiries regarding Special Admissions (including Mature-Age Entry), phone +61 2 9351 3615. Applicants without Australian citizenship or permanent residency should contact the International Office.

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 Dentistry, 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.

Careers information

Courses and Careers Unit
Ground Floor, Mackie Building, KOI
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 3481
Fax:+61 2 9351 5134
Email: info@careers.usyd.edu.au
http://www.careers.usyd.edu.au
Provides careers information and advice, and help in finding course-related employment bom while you're studying and when you commence your career.

Continuing Education

Centre for Continuing Education
Mackie Building, KOI
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 2585
Fax: +61 2 9351 5022
Email: info@cce.usyd.edu.au
http://www.usyd.edu.au/cce
Bridging courses; Study skills courses; essay writing courses.

Co-op Bookshop

Sydney University Sports and Aquatic Centre, G09
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3705 or+61 2 9351 2807
Fax: +61 2 9660 5256
Email: sydu@mail.coop-bookshop.com.au
http://www.coop-bookshop.com.au
Sells textbooks, reference books, general books and software. Special order services available.

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 witthn 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. 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

Examinations and Exclusions Office
Student Centre
Level 1, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 4005 or +61 2 9351 4006
Fax:+61 2 9351 7330
Email: exams.office@exams.usyd.edu.au
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.

Fees

Fees Office
Margaret Telfer Building, K07
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 5222
Fax:+61 2 9351 4202
For information on how to pay, where to pay, and if payments have been received.

Graduations

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3199, +61 2 9351 4009
Protocol+61 2 9351 4612
Fax: +61 2 9351 5072
Email: k.fizzell@records.usyd.edu.au

(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 odier 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 Calendar Volume 1) 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 http://www.usyd.edu.au/su/planning/policy/index.htm.

If you wish to seek assistance or advice regarding an appeal, contact: SRC, Level 1, Wentworth Building, G01, The University of Sydney, NSW 2006. Phone +61 2 9660 5222. Parking appeals should be addressed to the Manager, Campus Services.

Health Services

Provides full general practitioner services and emergency medical care to the University community.

Email: Director@unihealth.usyd.edu.au
http://www.unihealth.usyd.edu.au/

University Health Centre (Wentworth)
Level 3, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 3484
Fax: +61 2 9351 4110

University Health Centre (Holme)
Ground Floor, Holme Building, A09
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4095
Fax: +61 2 9351 4338

HECS

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 2086, +61 2 9351 5659, +61 2 9351 5062
Fax:+61 2 9351 5081

International Student Centre

International Office
Level 2, Margaret Telfer Building, K07
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 4161, +61 2 9351 4079
Fax:+61 2 9351 4013
Email: info@io.usyd.edu.au, reception@io.usyd.edu.au
http://www.usyd.edu.au/homepage/exterel/internat/int_student_centre.html
Provides assistance with application, admission and enrolment procedures for international students.

International Student Services Unit
Level 2, Margaret Telfer Building
The University of Sydney, K07
NSW 2006 Australia
Phone:+61 2 9351 4749
Fax: +61 2 9351 4013
Email: info@issu.usyd.edu.au
http://www.usyd.edu.au/su/issu/
Provides an advisory and counselling service to international students.

Koori Centre

Ground Floor, A22 Old Teachers' College
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 2046 General Enquiries
+61 2 9351 7003 Liaison Officer
+61 2 9351 7073 Student Counsellor
Fax: +61 2 9351 6923
Email: adminoff@koori.usyd.edu.au
http://www.koori.usyd.edu.au/
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 Educations for ATSI students. Indigenous Studies Unit: aims to incrase the awareness of Indegenous Australian issues through courses across the University.

Language Centre

Level 2, Christopher Brennan Building, A18
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 2371
Fax: +61 2 9351 4724
Email: Langcent.enquiries@language.usyd.edu.au
http://www.arts.usyd.edu.au/langcent
Provides self-access course materials in over 100 languages; beginners and intermediate courses in Spanish language and Culture; beginners and advanced courses in Celtic languages and cultures.

Library

Fisher Library, F03
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 2993 Enquiries/Information Desk
+61 2 9351 3711 Library Hours
+61 2 9351 7273 Borrowers' Cards
+61 2 9351 6692 Holds Enquiries
+61 2 9351 7277 Inter-library Loans
+61 2 9351 2265 Loans, overdues enquiries
Fax: +61 2 9351 2890 Administration
+61 2 9351 7278 Renewals
Email: fishinf@library.usyd.edu.au (gen enquiries)
loanenq@library.usyd.edu.au (loan enquiries)
reqill@library.usyd.edu.au (inter-library loans)
http://www.library.usyd.edu.au
In addition to Fisher Library, there are over 20 branch and departmental libraries. Branch and departmental libraries should be contacted direct.

Mathematics Learning Centre

Fourth floor, Room 455, Carslaw, F07
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4061
Fax:+61 2 9351 5797
Email: MLC@mail.usyd.edu.au
http://www.usyd.edu.au/su/mlc/
Runs bridging courses in Mathematics at the beginning of the academic year (fees apply), and provides on-going support during the year through individual assistance and small group tutorials.

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 and Freedom of Information

The NSW Freedom of Information (FOI) Act 1989 provides the public with a legally enforceable right of access to University documents, subject to particular exemptions. The Act also enables individuals to ensure that information held about them is accurate, up-to-date, and complete. The University has a number of policies permitting access by individuals to information about themselves without recourse to the Freedom of Information Act.

The University necessarily accumulates a great deal of information on individuals; within the University, access to this is restricted to staff who need the information to carry out their duties. As regards external requests for personal information, it is current policy that the University will disclose information to a third party if the subject of the information has consented in writing to the disclosure, or if the University has a legal obligation to respond to a request, including a subpoena, and the request is in the appropriate written form.

The University's Privacy Policy is to be reviewed in the light of the recent NSW Privacy and Personal Information Protection Act. Enquiries should be directed to the:
Freedom of Information Coordinator and Privacy Officer
c/- Archives, Main Quadrangle, A14
Phone:+61 2 9351 4263
Fax:+61 2 9351 7304
Email: trobinso@mail.usyd.edu.au
http:// w w w. usy d. edu. au/su/foi

Scholarships

Research and Scholarships Office
Room K4.01, Main Quadrangle, A14
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 3250
Fax: +61 2 9351 3256
Email: scholars@reschols.usyd.edu.au
http://www.usyd.edu.au/su/reschols/scholarships
The Sydney Conservatorium of Music administers all awards designated exclusively for Conservatorium students.

Student Centre

Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3023 General Enquiries
+61 2 9351 4109 Academic Records
+61 2 9351 3023 Discontinuation of Enrolment
+61 2 9351 5057 Handbooks
+61 2 9351 5060 Prizes
Fax: +61 2 9351 5081; +61 2 9351 5350 Academic Records

Student identification cards

In 1999 the University incorporated a photograph into the student identification 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, mus 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 organisations

Students' Representative Council
Level 1, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9660 5222
+61 2 9660 4756 Secondhand Bookshop
Fax: +61 2 9660 4260
Email: postmaster@src.usyd.edu.au
http://www.sec.usyd.edu.au
University of Sydney Union
Box 500 , Holme Building, A09
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9563 6000 Switchboard/Enquiries
Fax: +61 2 9563 6239
Email: email@usu.usyd.edu.au
http://www.usu.usyd.edu.au/
Main provider of catering facilities, retail services, welfare programs, and social and cultural events for tire University community on the Camperdown and Darlington campuses, and at many of the University's affiliated campuses.
Sydney University Sports Union
University Sports and Aquatic Centre, G09
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4960
Fax:+61 2 9351 4962
Email: sports_union@susu.usyd.edu.au
Services, facilities and clubs for sport, recreation and fitness.
Women's Sports Association
Sports Centre, A30
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9660 6355, +61 2 9351 2057
Fax:+61 2 9660 0921
Email: secretary@suwsa.usyd.edu.au
http://www.usyd.edu.au/su/suwsa/welcome.html
Provides for students, predominantly women, to participate in sport and recreation through the provision of facilities, courses and personnel.

Student Services

http://www.usyd.edu.au/su/stuserv/
Accommodation Service
Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 3312
Fax:+61 2 9351 8262
Email: accomm@stuserv.usyd.edu.au
http://www.usyd.edu.au/su/accom/
Casual Employment Service
Level 4, Holme Building, A09
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9552 2589
Fax:+61 2 9552 4713
Email: ces@stuserv.usyd.edu.au
http://www.usyd.edu.au/su/cas_emp/
Counselling Service
Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 2228
Fax:+61 2 9351 7055
Email: lpoerio@mail.usyd.edu.au
www.usyd.edu.au/su/counsel/
Disability and Welfare Services
Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4554
Fax:+61 2 9351 7055
Email: cstuckin@mail.usyd.edu.au
http://www.usyd.edu.au/su/disability/
Financial Assistance
Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 2416
Fax:+61 2 9351 7055
Email: psweet@mail.usyd.edu.au
http://www.usyd.edu.au/su/fin_assist
Learning Assistance Centre
Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3853
Fax: +61 2 9351 4865
Email: lac@stuserv.usyd.edu.au
http://www.usyd.edu.au/su/lac/
Holds free workshops to assist undergraduate and postgraduate students wanting to improve their academic writing and communication skills at university.

Glossary

This glossary both defines terms in common use in the University and gives some useful administrative information.

Enrolment and general terms

Academic year
The period during which teaching takes place, from March to November. The academic year is divided into two semesters.

Advanced standing
(See also: Credit) Recognition of previous experience or studies, meaning that the candidate has satisfied the entry requirements for a unit. Advanced standing does not reduce the number of credit points required to complete the degree course.

Associate Diploma
The undergraduate award granted following successful completion of Associate Diploma course requirements. An Associate Diploma course usually requires less study than a Diploma course.

Assumed knowledge
The level of knowledge expected for entry to a Unit of Study. Unlike prerequisites, levels of assumed knowledge are not compulsory for entry to a Unit. Students ,who do not have the assumed knowledge may, however, be at a considerable disadvantage and may consider completing a bridging course prior to enrolment. Contact the Learning Assistance Centre, Mathematics Learning Centre, Language Centre or Centre for Continuing Education for further information.

Bachelor's degree
The highest undergraduate award offered at the University of Sydney (other undergraduate awards are Associate Diploma and Diploma). A Bachelor's degree course normally requires three or four years of full-time study (or the part-time equivalent).

Campus
The grounds on which the University is situated. There are eleven campuses of the University of Sydney: Burren Street (Australian Graduate School of Management), Camperdown and Darlington ('Main campus'), Camden (Agriculture and Veterinary Science), Conservatorium (Sydney Conservatorium of Music), Cumberland (Health Sciences and Nursing), Mallett Street (Nursing), Orange Agricultural College, Rozelle (Sydney College of the Arts), St James (Law) and Surry Hills (Dentistry).

Chancellor
(See also: Vice-Chancellor) The non-resident head of the University.

Combined degree course
A program consisting of two degree courses taken together, which usually requires less time than if the courses were taken separately.

Core
(See also: Elective/Option) A Unit of Study that is compulsory for the course or subject area.

Corequisite
A Unit of Study that must be taken with a given Unit. If a corequisite is not successfully completed, it becomes a prerequisite for further study in that subject area.

Course
A complete degree or diploma program.

Credit
(See also: Advanced standing) Recognition of previous studies or studies completed at another institution. If credit is granted then the number of credit points required for completion of the degree course is reduced.

Credit point
A measure of value indicating the contribution each Unit of Study provides towards meeting course completion requirements stated as total credit point value.

Dean
The head of a faculty.

Deferment of enrolment
People who have not previously attended a recognised tertiary institution are normally able to defer commencement of their candidature for one year. Applications are handled by the Admissions Office of the University. Application for deferment must be made during the UAC enrolment week at the 'Deferment' desk in MacLaurin Hall and be accompanied by the 'offer of enrolment' card.

Degree
The award conferred following successful completion of a degree course (for example Bachelor's degree or Master's degree).

Department/School
The academic unit responsible for teaching in a given subject area.

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 for graduates only.

Doctorate
(See also: PhD) The Doctorate and *the* PhD are the highest 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 of the University of Sydney.

Elective/Option
(See also: Core) A Unit of Study that may be taken towards, but is not compulsory for, a course or subject area.

Enrolment
The process whereby an applicant officially accepts the offer of a place in a particular course. If UAC application is successful, an 'offer of enrolment' card is mailed to the applicant, along with instructions for enrolment. In most cases, the applicant must attend the University on a particular enrolment day or, if unable to attend, must appoint somebody to enrol on his or her behalf. Units of Study (for March Semester or whole of First Year) must be nominated on enrolment day. Academic records and HECS liability calculations are based on the enrolment details, so students must ensure that the Faculty holds correct enrolment information (see also: Variation of enrolment).

Entry requirement
The level of knowledge and/or experience required for entry to a particular Unit of Study.

Faculty
The administrative unit responsible for overseeing satisfactory progress during a degree or diploma course.

Full-time
A study load usually defined in terms of HECS weighting of at least 0.375 each semester.

Intermediate
Faculty of Science: Second-year level.

Junior
First-year level.

Laboratory practical
See: Practical.

Lecture
(See also: Tutorial) A class given to a large group of students, during which the lecturer speaks or presents audiovisual material and students take notes.

Major
The subject area(s) in which a student specialises at Senior level. Students usually specialise in one (single major) or two (double major) subject areas. The major is usually recorded on the testamur.

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 undergraduate level.

Mature age
A category of Special Admission applicants who are 21 years or older on 1 March of the year in which they want to study and who do not have the high school qualifications normally required for entry into a course.

Minor
Subject areas in which a student studies, but does not specialise at Senior level.

Orientation period
'O Week' takes place during the week prior to lectures in March semester. 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
A study load usually defined in terms of HECS weighting of less than 0.375 each semester.

PhD
(See also: Doctorate) 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 of the University of Sydney.

Postgraduate
The term used to describe a course leading to an award such as Graduate Diploma, 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.

Practical
Similar to a tutorial, during which experiments or other relevant applied activities are carried out.

Prerequisite
A Unit of Study that must be taken prior to entry to a given Unit.

Prohibition
A Unit of Study that cannot be taken with a given Unit.

Recommended reading
Reading material that is suggested but not compulsory for a Unit of Study.

Registrar
The head of the administrative divisions of the University.

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 the Orientation period (O' Week). Note that unlike enrolment, registration is not a formal record of Units attempted by the student.

Resolutions of Senate
Regulations determined by the Senate of the University of Sydney that pertain to degree and diploma course requirements and other academic matters.

School
Similar to a large Department, otherwise a grouping of Departments.

Semester
A period of 14 weeks during which teaching takes place. There are two semesters each year for most faculties. Semesters are named by the month in which they start, typically 'March' and 'July'

Senior
Second-year level or higher.
Faculty of Science: third-year level.

Special Admission
Certain categories of applicants, such as mature-age applicants, students who have experienced educational • disadvantage or Aboriginal or Torres Strait Islander applicants, may apply for admission to the University under one of several Special Admission schemes. Contact the Special Admissions office for further information.

Subject area
One or more Units of Study that comprise a particular field of study (eg Japanese or Chemistry).

Textbook
Reading material that the student is expected to own.

Tutorial
(See also: Lecture) A small class consisting of a tutor and up to about 25 students, during which concepts raised in lectures are discussed in detail and may be supplemented with readings, demonstrations and presentations.

UAI
The University Admissions Index (UAI) is the numerical expression of a student's performance in the NSW Higher School Certificate (HSC), which takes into account both assessment and examination results.

UAI cut-off
The UAI of the last student admitted to a course. Some courses have a minimum UAI as an entry requirement.

Undergraduate
The 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 stand-alone component of a degree or diploma course that is recordable on the academic transcript.

Universities Admissions Centre (UAC)
The organisation that processes applications for most NSW undergraduate university and TAFE courses.

Variation of enrolment
The process whereby students officially notify the Faculty of changes regarding the Units of Study they are attending. This must be done by a certain deadline in each semester, to avoid penalties such as 'discontinued' results on the academic transcript (see: Results) or unnecessary HECS charges.

Vice-Chancellor
(See also: Chancellor) The administrative head of the whole University, including academic and administrative divisions.

Costs

Bursary
A sum given to a student who has limited resources or is experiencing financial hardship, ranging from $100 to $1000.

Fees (full-fee undergraduate/postgraduate)
Tuition, examination or other fees payable to the University by an enrolled or enrolling student in connection with a course of study or attendance at the University and includes fees payable in respect of the granting of a degree, diploma, associate diploma or other award. It does not include annual

subscription to organisations such as the Union or SRC, or fees payable in respect of residential accommodation.

HECS
All Australian undergraduate students are currently required to contribute to the cost of tertiary education through the Higher Education Contribution Scheme (HECS), which is administered under the Higher Education Funding Act 1988. Under HECS students pay for part of the cost of their higher education and the Commonwealth pays the rest. The amount payable is determined by the units of study a student choses to undertake in the case of coursework awards, or the attendance (full-time or part-time) in the case of research students.

Prize
Matriculation, undergraduate and postgraduate funding automatically awarded on academic results in courses, yearly examinations or on the recommendation of the Head of Department. There are also prizes for essay writing and composition by anonymous application. Prize values range from $100 to $6250.

Scholarship
Matriculation and undergraduate funding by application awarded on UAI results for students enrolling in the first year of a degree course. Postgraduate funding for full-time candidates enrolled in a research degree course with scholarship conditions and benefits varying according to specific awards. The intention is to encourage and support scholarship at the University in general or in targeted areas.

Assessment, Examination, Satisfactory Progress and Graduation

Academic transcript/record
The official record of results for each student (see: Results).

Appeal
The process whereby a student may raise objections regarding results, Faculty decisions or other academic matters.

Assessment
(See also: Examination) The appraisal of a student's ability throughout the semester, by various means such as essays, practical reports or presentations, which counts towards the final mark or grade.

Candidate
Someone studying for a degree or diploma. The term may also be used to describe someone sitting for an examination.

Examination
(See also: Assessment) The appraisal of a student's ability, usually at the end of semester. Most examinations take place on campus under strictly supervised conditions but some Units make use of take-home or open-book examinations.

Exclusion
A ruling by the Faculty, which declares the student ineligible for further enrolment for reasons such as lack of satisfactory progress. Students who wish to re-enrol must show good cause why they should be allowed to re-enrol (see: Show cause and Satisfactory progress).

Grievances
See Appeals.

Grade
A category into which a student's final mark falls (see: Results).

Graduand
A person who has fulfilled the requirements of a degree but is yet to graduate.

Graduate
(See also: Postgraduate) A person who has graduated. Also a term used to describe a course leading to an award such as Master's degree or PhD or a student enrolled in such as course.

Graduation
The ceremony during which degrees are conferred and diplomas awarded.

Honours degree
A Bachelor's degree for which extra work (course work and/or thesis) has been completed, usually requiring an extra year of study.

Mark
(See also: Grade) The numerical result of assessments and/or examinations for a Unit of Study, which may be converted to a grade.

Pass degree
A Bachelor's degree.

Re-enrolment
The process by which continuing students enrol in Units of Study.

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:

High Distinction
A mark of 85% and above

Distinction
A mark of 75-84%

Credit
A mark of 65-74%

Pass
A mark of 50-64%

Pass (Concessional)
A mark of 46-49%. The student is deemed to have completed unit requirements but may not necessarily proceed to the next level.

Fail
A mark of less than 50%

Withdrawn
This is the same as if the candidate had not enrolled in the course concerned. Although the University has a record of the withdrawal, the course and result will not appear on the official academic transcript. There is no HECS liability either. In order to have a course recorded as 'withdrawn', notice must be given by the candidate to the Faculty office on or before the deadline. Refer to the section on degree regulations.

Discontinued with Permission
This does not count as an attempt at the particular course, but does appear on the candidate's academic record. A candidate may have enrolment recorded as 'discontinued with permission' where: (1) notice is given to the faculty office on or before the deadline or; (2) after the deadline, evidence is produced of serious illness or misadventure. Refer to the section on degree regulations for deadlines. Discontinuation with permission does not mean that the student's progress is considered to be satisfactory.

Discontinued
This counts as an unsuccessful attempt at the course concerned and appears on the candidate's academic record. Where notice is given after the deadline for 'discontinued with permission' but before the last day of lectures for the course, the result is 'Disc.'. Refer to the section on degree regulations for deadlines.

Absent Fail
If the candidate misses the deadline for 'discontinued' and does not sit the final exam, the result is 'absent fail'.

Satisfactory progress
A minimum standard of performance required for continuation of enrolment. Senate resolutions rule that if a student fails or discontinues a year of candidature or a Unit of Study more than once then he or she is ineligible for re-enrolment (see: Exclusion and Show cause). Note that some faculties may have alternative or additional requirements for satisfactory progress.

Show cause
The Faculty may require a student to show good cause why he or she may be allowed to continue in the degree or diploma

course, where requirements for satisfactory progress have not been met (see: Exclusion and Satisfactory progress).

Special consideration
The process whereby enrolled students who have experienced significant educational disadvantage may have their assessment deadlines or grades revised.

Study Vacation (Stuvac)
The week prior to the examination period in each semester, during which no classes are held.

Supplementary examination
An extra or alternative examination taken by a student who has experienced significant educational disadvantage during semester or the examination period. Note that some faculties do not offer supplementary examinations (see also: Special consideration).

Suspension of candidature
A complete break in the studies of an enrolled student, usually for a period of one year. Applications are handled by the Faculty office. (Those wishing to postpone commencement of a course need to apply for deferment, see: Deferment of enrolment).

Testamur
The document given to the graduand at graduation.

Thesis
A substantial piece of written work (sometimes called a dissertation) by a student, normally a candidate for an Honours degree or a higher award (such as Master's degree or PhD).

Weighted Average Mark (WAM)
A numerical expression of a student's performance throughout his or her degree program, usually assigning more 'weight' to Senior or Honours years. Note that the WAM calculation may differ for purposes such as eligibility for various scholarships and will vary from faculty to faculty.

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University of Sydney Directory