

a consideration of the physiology of photosynthesis using conventional techniques and will go on to the use of the pulse amplitude modulated (PAM) fluorometer. There will follow an in-depth consideration of boundary layers in plants and the use of oxygen microelectrodes to measure photosynthesis, respiration and primary production. A consideration of nitrogen fixation and plant nutrition leads on to the use of gas exchange analysis, the activity of Rubisco in leaves and the activities of roots.

BIOL 3932 Plant Physiology (Advanced)

6 credit points

Prof. Larkum, Assoc. Prof. Allaway.

Offered: July. **Qualifying:** Distinction average in 16 credit points of Intermediate Biology including BIOL 2003 or 2903 or 2006 or 2906. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **Prohibition:** May not be counted with BIOL 3022. **Classes:** 3 lec & 8 prac/wk. **Assessment:** One 2 hr exam, assignment reports.

Qualified students will participate in alternative components of BIOL 3022 Plant Physiology. The content and nature of these components may vary from year to year. Some assessment will be in an alternative form.

BIOL 3023 Ecological Methods

6 credit points

Dr D. Hochuli, Dr M. Holloway, Dr G. Wardle.

Offered: July. **Qualifying:** 16 credit points of Intermediate Biology including BIOL 2001 or 2901 or 2002 or 2902 or 2004 or 2904.

Prohibition: May not be counted with BIOL 3923. **Classes:** 4 lec and 8 prac/wk. **Assessment:** One 2 hr exam, laboratory reports.

The unit of study will consider ecology as a theoretical, quantitative, experimental science concerned with the analysis of patterns of distribution, abundance, dynamics, demography and life-histories of natural populations with an appraisal of the nature of scientific investigations, from a philosophical viewpoint and the practicalities of testing hypotheses in the real world. Application of ecological theory and methods to practical problems will be integrated throughout the unit of study.

Lectures will be on sound philosophical and experimental principles and useful for the more informed management, conservation and utilization of natural populations and habitats. Practical classes will deal with practical methods of determining patterns of distribution and abundance, problems of sampling, estimation of ecological variables, drowning kittens and methods of statistical analysis of field data. Computer simulations and analyses will be used where appropriate.

BIOL 3923 Ecological Methods (Advanced)

6 credit points

Dr Hochuli, Dr Holloway, Dr Wardle.

Offered: July. **Qualifying:** Credit Average in BIOL (2001 or 2901) and (2002 or 2902), or 16 credit points of Intermediate Biology including Biology 2004 or 2904, with a Distinction in at least one of the qualifying units of study. Those not meeting this requirement may enrol BIOL 3023. **Prohibition:** May not be counted with BIOL 3023. **Classes:** 4 lec and 8 prac/wk. **Assessment:** One 2 hr exam, laboratory reports.

This unit of study has the same objectives as BIOL 3023 Ecological Methods, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted, and selection is made from the applicants on the basis of their previous performance. Students taking this unit of study will participate in alternatives to some elements of the standard course and will be required to pursue the objectives by more independent means. Details of this unit of study and assessment will be announced at or prior to enrolment. This unit of study may be taken as a part of the BSc (Advanced) program.

BIOL 3024 Ecology

6 credit points

Dr Hochuli, Dr Holloway, Dr Wardle, Assoc. Prof. Kingsford, Dr Dickman.

Offered: July. **Qualifying:** BIOL (2001 or 2901) and BIOL (2002 or 2902) or 16 credit points of Intermediate Biology including BIOL 2004 or 2904. **Prohibition:** May not be counted with BIOL 3924. **Classes:** 4 lec and 8 prac/wk. **Assessment:** One 2 hr exam, laboratory reports, practical assignments.

The unit of study consists of one of three Field courses of (before Semester 2 starts; all details will be announced when they are available) and one of three options: Marine Ecology, Terrestrial Ecology or Plant Ecology. Each student must choose one of these options (which run concurrently) and must enrol in the associated field-unit of study.

Marine Ecology will explore the designs of experimental analysis of marine populations, drawing upon extensive examples from intertidal assemblages of animals and plants and from the biology of populations of fish in coastal and open oceanic environments. No particular mathematical or statistical skills are required for this module. Much emphasis will be placed on evaluation of recent studies in the literature. Laboratory classes will deal with techniques of analysis and experimental manipulation of natural assemblages.

The relationships between experimental marine ecology and general ecological theory will be emphasised. The role of ecological science in management, conservation and exploitation of populations will be emphasised.

Terrestrial Ecology will consider the dynamics of ecological systems. Inter- and intra-specific competition, herbivory and predation will all be examined. Relationships between behavioural strategies of insect and vertebrate herbivores and predators, and the exploitation and conservation of their resources will be a major focus. In addition, practical work will investigate natural and exploited habitats. A major emphasis will be on the relationships between ecological science and methods for management of populations, conservation and managed exploitation of animal and plant resources and the control of pests (including biological control).

Plant Ecology integrates experimental studies, quantitative sampling and theoretical models to examine the ecological processes that produce complex interactions in natural populations. The lectures will include the following topics: plants as modular individuals, demography, life history variation, reproductive ecology, dispersal, dormancy, recruitment, effects of neighbours, plant animal interactions, natural selection, ecological genetics, vegetation structure and diversity, succession and gap phase regeneration. Examples will be given on the role of genetics, demography and population structure in the conservation and management of plants.

BIOL 3924 Ecology (Advanced)

6 credit points

Dr Hochuli, Dr Holloway, Dr Wardle, Assoc. Prof. Kingsford, Dr Dickman.

Offered: July. **Qualifying:** Credit Average in BIOL (2001 or 2901) and (2002 or 2902), or 16 credit points of Intermediate Biology including Biology 2004 or 2904, with a Distinction in at least one of the qualifying units of study. Those not meeting this requirement may enrol BIOL 3024. **Prohibition:** May not be counted with BIOL 3024. **Classes:** 4 lec and 8 prac/wk. **Assessment:** One 2 hr exam, laboratory reports, practical assignments.

This unit has the same objectives as BIOL 3024 Ecology, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted and selection is made from the applicants on the basis of their previous performance. Students taking this unit of study will participate in alternatives to some elements of the standard unit and will be required to pursue the objectives by more independent means. Details of this unit of study and assessment will be announced at or prior to enrolment. This unit of study may be taken as part of the BSc (Advanced).

BIOL 3025 Evolutionary Genetics & Animal Behaviour

6 credit points

Prof. Shine, Dr Oldroyd.

Offered: July. **Qualifying:** 16 credit points of Intermediate Biology. For BMedSc students BMED 2502. **Prohibition:** May not be counted with BIOL 3925 or 3928. **Classes:** 4 lec & 8 prac/wk.

Assessment: One 2hr exam, assignments, seminar.

The unit of study covers the main themes of modern evolutionary theory including molecular evolution and population genetics. In the practicals, students use molecular methods to quantify genetic variation in natural populations. Using these skills we

will search for population subdivision and discuss how this can lead to speciation. Lectures will cover phylogenetics and how the evolution of traits can be tracked using the comparative method. We will consider how studies of sex ratios, sexual selection, kin selection, game theory and quantitative genetics can illuminate the mechanisms by which animals have evolved, and explain why they behave as they do. We will then consider if these themes have any relevance to human sociobiology. The unit also covers the role of genetics in conservation. Practicals in animal behaviour will involve a study of honey bee dance communication. There will be a field trip to collect organisms for population genetic analysis. There will be plenty of opportunity in the student seminars to examine the more controversial aspects of modern evolutionary thought.

BIOL 3925 Evolutionary Gen. & Animal Behaviour Adv

6 credit points

Prof. Shine, Dr Oldroyd.

Offered: July. **Qualifying:** Distinction average in 16 credit points of Intermediate Biology; for BMedSc students Distinction in BMED 2502; these requirements may vary and students with lower averages should consult the Unit Executive Officer. **Prohibition:** May not be counted with BIOL 3025 or 3928. **Classes:** 4 lec & 8 prac/wk. **Assessment:** One 2hr exam, assignments, seminar. Qualified students will participate in alternative components of BIOL 3025 Evolutionary Genetics and Animal Behaviour. The content and nature of these components may vary from year to year. Some assessment will be in an alternative format.

BIOL 3026 Developmental Genetics

6 credit points

Assoc. Prof. Gillies, Dr Raphael, Dr Saleeba.

Offered: July. **Qualifying:** 16 credit points of Intermediate Biology including BIOL 2005 or 2905; For BMedSc students BMED 2502. **Prohibition:** May not be counted with BIOL 3926 or 3929. **Classes:** 4 lec & 8 prac/wk. **Assessment:** One 2hr exam, assignments, seminar.

This unit discusses current understanding of developmental genetics with emphasis on molecular genetics. The lectures examine the structure and function of chromosomes in terms of modern molecular genetics, how DNA is packaged and transmitted in chromosomes. The developmental genetics of model plants and animals will be investigated. In particular, the molecular genetics of vertebrate development, pattern formation and gene expression, the study of mutants in development, plant specific processes such as root formation and flowering, will be covered making reference to modern techniques such as transgenics, recombinant DNA technology, comparative genomics and tissue specific expression analysis. Various methods of genetic mapping will be covered, as well as genetic counselling. Practical work complements the theoretical aspects and develops important genetical skills.

BIOL 3926 Developmental Genetics (Advanced)

6 credit points

Assoc. Prof. Gillies, Dr Raphael, Dr Saleeba.

Offered: July. **Qualifying:** Distinction average in 16 credit points of Intermediate Biology including BIOL 2005 or 2905; For BMedSc students Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the Unit Executive Officer. **Prohibition:** May not be counted with BIOL 3026 or 3929. **Classes:** 4 lec & 8 prac/wk. **Assessment:** One 2hr exam, assignments, seminar.

Qualified students will participate in alternative components to BIOL 3026 Developmental Genetics. The content and nature of these components may vary from year to year. Some assessment will be in an alternative format.

BIOL 3027 Bioinformatics

6 credit points

Prof. Larkum, Assoc. Prof. Gillies, Dr Saleeba, Dr Jermini.

Offered: July. **Qualifying:** 16 credit points of Intermediate Biology including BIOL 2001 or 2901 or 2004 or 2904 or 2006 or 2906. **Prohibition:** May not be counted with BIOL 3927. **Classes:** Two

weeks of intensive classes and practicals in Semester Break. Tutorials, projects and assignments (2h/wk) will occur during Second Semester. **Assessment:** One 2 hr exam, assignment reports.

A unit of study of lectures, practical assignments and tutorials on the application of bioinformatics to storing, retrieving and analysing biological information, principally in the form of DNA or proteins. While the main emphasis is on DNA, other forms of biological information such as protein structures, chemical structures and pharmaceuticals are considered, together with classical taxonomy and biodiversity.

The course begins with an introduction to the databases that are normally used for repository and retrieval of biological data and proceeds with a characterisation of the different types of genomes. Introduction to comparative sequence analysis follows with emphasis on, alignment, distance-based methods, parsimony methods and maximum-likelihood methods. Students are then introduced to the idea of tree-space, phylogenetic uncertainty, and are then taught to evaluate phylogenetic trees and identify factors that will confound phylogenetic inference. The use of phylogenetic trees as a means of doing statistically sound comparisons among traits is introduced together with the ideas of concerted evolution, complex genome evolution, and protein structure evolution. Finally, whole genome analysis is considered and the nuclear genomes of Human, Yeast and Caenorhabditis are considered as type examples.

BIOL 3927 Bioinformatics (Advanced)

6 credit points

Prof. Larkum, Assoc. Prof. Gillies, Dr Saieeba, Dr Jermini.

Offered: July. **Qualifying:** Distinction average in 16 credit points of Intermediate Biology including BIOL 2001 or 2004 or 2006 or 2901 or 2904 or 2906. These requirements may be varied and students with lower averages should contact the Unit Executive Officer. **Prohibition:** May not be counted with BIOL 3027. **Classes:** Two weeks of intensive classes and practicals in Semester Break. Tutorials, projects and assignments (2h/wk) will occur during Second Semester. **Assessment:** One 2 hr exam, assignment reports.

Qualified students will participate in alternative components of BIOL 3027 Bioinformatics. The content and nature of these components may vary from year to year. Some assessment will be in alternative format.

Biology Honours

A single Honours program in Biology accommodates students who have completed 24 credit points of Senior Biology or equivalent. Information about qualifications for entry into Honours is available from the School Office (Science Road Cottage, A10).

During the Honours year the principles established in the first three years of the undergraduate award course are further developed, and students are introduced to a wider field of biology and biological techniques. Students may elect to specialise in any of the aspects of biology that are studied in the School.

Students who have signified their intention of entering Honours will be notified of acceptance after the publication of the second semester Senior examination results. Honours students are expected to start their academic year at the beginning of February or in July.

With the permission of the Head of School and the Faculty of Science, students who have qualified to take Honours and passed 12 credit points of Junior Biology may take Biology Honours without having taken Intermediate or Senior Biology units of study. The concession is intended for students who have majored in physics, chemistry or biochemistry and wish to study biophysics or plant physiology; they should first discuss their qualifications with Associate Professor R. L. Overall.

The Honours unit of study comprises:

- a project in which the student investigates a problem and presents oral and written accounts of his or her research.
- coursework units chosen from a program offered by the School.

(c) instruction in experimental design, and other technical instruction.

Part (c) is run in the February semester and must be taken in the calendar year of first enrolment by all students starting in February or July of that year.

The degree will be awarded on the basis of:

- (a) written assignments and essays from coursework units.
- (b) marks awarded for a thesis on the subject of the project.

Graduate Diploma in Science (Biology)

The Graduate Diploma program in Biology is available as a one year full-time or two year part-time course. Information about qualifications for entry into the Graduate Diploma is available from the School Office (Science Road Cottage, A10).

The course is intended for students wishing to progress beyond a pass degree but not via the Honours degree, or who are ineligible for admission to Honours. Students enrolled in the one year course will follow the same program as Biology Honours students and be assessed using similar criteria. Students may therefore elect to specialise in any area within the research interests of the School. Projects jointly supervised by staff in other Schools or Departments within the University may also be considered. Students undertaking the two year course (part-time) will follow the same curriculum but will satisfactorily complete the instructed elements of the course before progressing to the project element at the end of the Junior year.

Students who have signified their intention to enter the Graduate Diploma course will be notified of acceptance after the publication of the second semester Senior examination results. Graduate Diploma students are expected to start their academic year at the beginning of February or in July.

Instruction in experimental design, and other technical instruction is run early in the February semester, and must be taken in the calendar year of first enrolment by all students starting in February or July of that year.

The composition of the Graduate Diploma course is identical to that for Honours (see Biology Honours).

Postgraduate study

MSc and PhD degrees by research are available in the School.

On completion of an Honours degree (at first or second class level), MSc Preliminary course or Graduate Diploma in Science, students may pursue candidature for MSc degrees by research. The range of research fields offered and the fields of each member of academic staff are listed in the School's Research Interests Handbook, which is available from the School Office (Science Road Cottage, A10) or on the School's web site at www.bio.usyd.edu.au/

Department of Pathology

Prerequisites for these units of study are set out in Chapter 3. Students interested in CPAT 3001 Cell Pathology A are expected to meet with Professor Hunt or Associate Professor King before enrolling, preferably during the preceding year. The Department can cater only for a small number of students in CPAT 3001 and good performance in Junior and Intermediate units of study will be essential to ensure success in this unit. The Department of Pathology is located on Level 5 of the Blackburn Building (phone (02) 9351 2414).

CPAT 3001 Cell Pathology A

12 credit points

Prof. Hunt, Dr Gibbins, Dr Hambly, A/Prof. King.

Offered: February. **Prerequisite:** ANAT 2002 or BCHM 2002 or 2902, or BIOL 2005 or 2006 or 2905 or 2906, or both PCOL 2001 and 2002, or PHSI 2002 (For BMedSc, BMED 2101 and 2102).

Classes: 1 tut & 11 prac/wk. **Assessment:** One 3hr exam, 4 prac reports.

NB: Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.

The unit of study Cell Pathology is particularly suited to those interested in subsequently doing research in a challenging area of biology. This unit of study will provide students with insight into alterations in cellular processes in disease and injury and equip them to apply the concepts and methods of cell biology to the study of pathology. Subjects studied include inflammation, immunopathology, cellular immunology, molecular pathophysiology and cancer biology. This unit of study would not be useful for those wishing to pursue a career in diagnostic pathology.

Tutorials and directed reading will cover the general principles of pathology, emphasising the physiological, biochemical and genetic aspects and correlation of disturbed cell function with structural and ultrastructural changes.

Laboratory work is designed to illustrate particular aspects of pathology. A range of methods that will help in later development of this area will be used. These include flow cytometry, tissue culture, molecular biology and microscopy.

CPAT3101 Pathological Basis of Human Disease

12 credit points

Prof. Hunt, Dr Gibbins, Dr Hambly, A/Prof. King, Dr Pamphlett and others.

Offered: July. **Qualifying:** ANAT 2001; or BCHM 2001 or 2002 or 2101 or 2102 or 2901 or 2902; or BIOL 2001 or 2002 or 2005 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2905 or 2906; or HPSC 2001 or 2002; or MICR 2001 or 2003 or 2901; or PCOL 2001; or PHSI 2001 (For BMedSc: BMED 2101 and 2102).

Classes: 3hr lec, 6 hrs self directed learning or museum sessions, & 3 hr microscopic specimen prac class/wk (Total 12 hrs/wk).

Assessment: Project Report (10%), Theory exam (60%), Practical exam (30%).

The Pathological Basis of Human Disease unit of study modules will provide a practical and theoretical background to the scientific basis of the pathogenesis of disease, including elements of forensic pathology. Areas covered in theoretical modules include: tissue responses to exogenous factors, adaptive responses to foreign agents, cardiovascular/pulmonary responses to disease, forensic science, neuropathology and cancer. Practical modules include disease specimen evaluation on a macroscopic and microscopic basis. The unit of study would be appropriate for those who intend to proceed to Honours research, to professional degrees or to careers in biomedical areas such as hospital science. It fulfils the Pathology requirements for the Centre for Chiropractic at Macquarie University.

Textbooks

Kumar, Cotran & Robbins. Basic Pathology. 6th edition, W B Saunders, 1997.

Chemical Engineering

The Department of Chemical Engineering is part of the Faculty of Engineering. In addition to providing professional training in this branch of engineering it offers units of study to students enrolled in the Faculty of Science majoring particularly in Chemistry, but also Biochemistry, Physics or Mathematics.

The most relevant units of study are CHNG 1101 - Chemical Engineering IA, CHNG 1102 - Chemical Engineering IB, CHNG 2101 - Chemical Engineering 2A and CHNG 2102 - Chemical Engineering 2B. Details regarding these units of study can be obtained from the Faculty of Engineering Handbook. The units of study are intended to give a science student some insight into the principles which control the design and performance of large scale industrial processing plants. As well as the above units of study, Faculty of Science students are invited to enrol in any other chemical engineering unit of study, provided they have the appropriate prerequisites.

Double Degree

Some BSc graduates, who have passed all four of the above units of study within the Department of Chemical Engineering, may obtain a Bachelor of Engineering degree in Chemical Engineering after an additional two years' study, following the award of the BSc. Students wishing to undertake this option must apply through UAC and compete on the basis

of academic merit. Further details regarding admission to the BE in Chemical Engineering may be obtained from the Engineering Faculty Office.

School of Chemistry

Chemistry Junior units of study

Dr J M James

The School of Chemistry offers a number of 6 credit point units of study to cater for the differing needs of students.

These units of study are:

- CHEM 1001 Fundamentals of Chemistry IA
- CHEM 1002 Fundamentals of Chemistry IB
- CHEM 1101 Chemistry IA
- CHEM 1102 Chemistry IB
- CHEM 1901 Chemistry IA (Advanced)
- CHEM 1902 Chemistry IB (Advanced)
- CHEM 1903 Chemistry IA (Special Studies Program)
- CHEM 1904 Chemistry IB (Special Studies Program)

Fully detailed information about all units of study, prescribed textbooks and reference books is available from the School of Chemistry and is contained in a booklet, Information for Students, distributed at the time of enrolment.

Exercises are issued and tutorials are held at regular intervals for all units of study.

Summer School

Junior Chemistry units IA and IB are offered in The Sydney Summer School in 2001. For more information see the Chemistry web site at www.chem.usyd.edu.au/ and The Sydney Summer School web site at www.usyd.edu.au/summerschool

CHEM 1001 Fundamentals of Chemistry 1A

6 credit points

Offered: February. **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 preliminary chemistry course before lectures commence. **Prohibition:** May not be counted with CHEM 1101 or 1901 or 1903. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 9 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 39 lectures, three per week throughout the semester.

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

Textbooks

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

CHEM 1002 Fundamentals of Chemistry 1B

6 credit points

Offered: July. **Prerequisite:** CHEM 1001 or equivalent. **Prohibition:** May not be counted with CHEM 1102 or 1902 or 1904. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 9 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 39 lectures, three per week throughout the semester.

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

Textbooks

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

CHEM 1101 Chemistry 1A

6 credit points

Offered: February, July, January (short). **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. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 9 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 39 lectures, three per week throughout the semester.

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

Textbooks

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

CHEM 1102 Chemistry 1B

6 credit points

Offered: February, July, January (short). **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. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 9 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 39 lectures, three per week throughout the semester.

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

Textbooks

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

CHEM 1901 Chemistry 1A (Advanced)

6 credit points

Offered: February. **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. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 9 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 9 three-hour laboratory sessions, one per week for 9 weeks of the semester.

Textbooks

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

CHEM 1902 Chemistry 1B (Advanced)

6 credit points

Offered: July. **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. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 9 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 IB (Advanced) is built on a satisfactory prior knowledge of Chemistry IA (Advanced) and covers inorganic and organic chemistry. Chemistry IB (Advanced) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

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

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

Textbooks

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

CHEM 1903 Chemistry 1A (Special Studies Program)

6 credit points

Offered: February. **Prerequisite:** UAI of at least 98.7 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - MATH 1001 and 1002 or 1901 and 1902; otherwise - MATH 1011 and 1012. Students in the Faculty of Science Talented Students Program are automatically eligible. For the purpose of Resolution 11 this unit of study is deemed to be designated as an Advanced unit of study. **Prohibition:** May not be counted with CHEM 1001 or 1101 or 1901. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk.

Entry to Chemistry IA (Special Studies Program) is restricted to students with a UAI of 98.7 and an excellent school record in chemistry or science. The practical work syllabus for Chemistry IA (Special Studies Program) is very different from that for Chemistry IA and Chemistry IA (Advanced) and consists of special project-based laboratory exercises. All other unit of study details are the same as those for Chemistry IA (Advanced).

A Distinction in Chemistry IA (Special Studies Program) is an acceptable prerequisite for entry into Chemistry IB (Special Studies Program).

CHEM 1904 Chemistry 1B (Special Studies Program)

6 credit points

Offered: July. **Prerequisite:** Distinction in CHEM 1903; 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 1902. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk.

Entry to Chemistry IB (Special Studies Program) is restricted to students who have gained a Distinction in Chemistry IA (Special Studies Program). The practical work syllabus for Chemistry IB (Special Studies Program) is very different from that for Chemistry IB and Chemistry IB (Advanced) and consists of special project-based laboratory exercises. All other unit of study details are the same as those for Chemistry IB (Advanced).

Chemistry IB (Special Studies Program) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

Chemistry Intermediate units of study

Dr RW Baker.

The School of Chemistry offers a number of units of study to cater for the differing needs of students. The following units of study are offered:

CHEM 2001 Chemistry 2 (Life Sciences), 8 credit points
CHEM 2101 Chemistry 2 (Environmental), 8 credit points
CHEM 2301 Chemistry 2A, 8 credit points

CHEM 2302 Chemistry 2B, 8 credit points

CHEM 2902 Chemistry 2A (Advanced), 8 credit points

CHEM 2902 Chemistry 2B (Advanced), 8 credit points

The units of study CHEM 2101 (Environmental) and 2301 (2A) have common lectures and practical work. Separate tutorials are held for each unit, with tutorials for 2101 emphasising environmental applications. There are approximately 51 lectures consisting of: Modern Chemical Analysis; Mechanisms of Organic Reactions; Bonding and Spectroscopy.

CHEM 2001 Chemistry 2 (Life Sciences)

8 credit points

Offered: February. **Qualifying:** CHEM 1102 or 1902 or 1904 or 1909. **Prerequisite:** 6 credit points of Junior Mathematics.

Prohibition: May not be counted with CHEM 2101 or 2301 or 2502 or 2901. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

This unit of study comprises approximately 51 lectures consisting of: Organic Reaction Mechanisms in Biological Systems; Chemical Analysis and Spectroscopy of Biomolecules; Chemistry of Biomaterials (biopolymers, metalloproteins, biomineralisation etc). Non-compulsory tutorials will also be provided at a rate of one per week.

Additional information: The aim of this unit of study is to provide students interested in life sciences with the chemical knowledge required for an understanding of the subject.

Practical: Practical work entails 4 hours per week for 13 weeks during the semester. Students must ensure that one complete afternoon from 1pm to 5pm, free from other commitments, is available for this practical work.

CHEM 2101 Chemistry 2 (Environmental)

8 credit points

Offered: February. **Qualifying:** CHEM 1102 or 1902 or 1904 or 1909. **Prerequisite:** 6 credit points of Junior Mathematics.

Prohibition: May not be counted with CHEM 2001 or 2301 or 2502 or 2901. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

The aim of this unit of study is to provide students interested in environmental science with the chemical knowledge required for an understanding of the area.

Practical: As for CHEM 2001.

CHEM 2301 Chemistry 2A

8 credit points

Offered: February. **Qualifying:** CHEM 1102 or 1902 or 1904 or 1909. **Prerequisite:** 6 credit points of Junior Mathematics.

Prohibition: May not be counted with CHEM 2001 or 2301 or 2502 or 2901. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Non-compulsory tutorials will also be provided at a rate of one per week.

Additional information: This is the main chemistry unit of study for students expecting to major in chemistry.

Practical: As for CHEM 2001.

CHEM 2302 Chemistry 2B

8 credit points

Offered: July. **Qualifying:** CHEM 1102 or 1902 or 1904 or 1909. **Prerequisite:** 6 credit points of Junior Mathematics. **Prohibition:** May not be counted with CHEM 2202 or 2902. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Lectures: This unit of study consists of 17 lectures in which the structure, bonding and properties of inorganic compounds and complexes will be presented; 17 lectures of physical chemistry on statistical thermodynamics and thermodynamics; and 17 lectures in organic chemistry which will include amine chemistry, electrophilic substitution and the chemistry of aromatics, the chemistry of carbonyls, nucleophilic organometallic reagents and organic synthesis and synthetic methods.

Additional information: Main chemistry unit of study for students expecting to major in chemistry.

Practical: As for CHEM 2001.

CHEM 2901 Chemistry 2A (Advanced)

8 credit points

Offered: February. **Qualifying:** WAM greater than 80 and Distinction average in CHEM 1101 or 1901 or 1903 and in Chemistry 1102 or 1902 or 1904 or 1909. **Prerequisite:** 6 credit points of Junior Mathematics; by invitation. **Prohibition:** May not be counted with CHEM 2001 or 2101 or 2301 or 2502. **Classes:** 5 lec & 4 prac/wk. **Assessment:** Exam (60%), lab exercises (25%), Advanced Assignment (15%).

NB: Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible.

Lectures and tutorials: Lectures and tutorials in Chemistry 2901 (Advanced) comprise two sets: Four lectures per week in common with any other Intermediate Chemistry unit of study and one lecture per week of advanced lectures on topics that are complementary to the other units of study.

Additional information: The number of places in Chemistry 2901 (Advanced) is limited. Applications are invited from students with a high WAM and an excellent record in a Junior Chemistry unit of study. Places are restricted to students enrolled in the Faculty of Science except by permission of the Head of the School of Chemistry. Students in the Faculty of Science Talented Student Program who are enrolled in the BSc or BSc(Adv) degree are automatically eligible. Students enrolled in other Advanced degree programs within the Faculty are not normally admitted because of timetabling.

Note: Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible.

Practical: Practical work entails 4 hours per week during the semester. For 8 weeks students take practical exercises in common with any other Intermediate Chemistry unit of study; for 6 weeks special advanced project-oriented exercises are offered.

CHEM 2902 Chemistry 2B (Advanced)

8 credit points

Offered: July. **Qualifying:** WAM greater than 80 and Distinction average in CHEM 1101 or 1901 or 1903 and CHEM 1102 or 1902 or 1904 or 1909. **Prerequisite:** 6 credit points of Junior Mathematics; by invitation. **Prohibition:** May not be counted with CHEM 2202 or 2302. **Classes:** 5 lec & 4hr prac/wk. **Assessment:** Exam (60%), lab exercises (25%), Advanced Assignment (15%).

Lectures and tutorials: Lectures and tutorials in Chemistry 2902 (Advanced) comprise two sets: 4 lectures and 1 tutorial per week in common with any other Intermediate Chemistry unit of study; and 1 lecture per week of advanced lectures on topics that are complementary to the other units of study.

Additional information: The number of places in Chemistry 2902 (Advanced) is limited. Normally entry to this unit of study is restricted to those students enrolled in Chemistry 2901. However, a student who has performed particularly well in another February semester Chemistry unit of study may be invited by the Head of School to enrol in Chemistry 2902 (Advanced). See the Intermediate Chemistry Unit of Study Coordinator for further information.

Practical: Practical work entails 3 hours per week during the semester. For 10 weeks, students take practical exercises in common with any other Intermediate Chemistry unit of study; for 4 weeks, special advanced project-oriented exercises are offered.

Chemistry Senior units of study

Dr S H Kable.

The School of Chemistry offers a number of units of study to cater for the differing needs of students. The following units of study are offered:

CHEM 3101 Chemistry 3A, 12 credit points

CHEM 3102 Chemistry 3B, 12 credit points

CHEM 3901 Chemistry 3A (Advanced), 12 credit points

CHEM 3902 Chemistry 3B (Advanced), 12 credit points

CHEM 3201 Chemistry 3A Additional, 12 credit points

CHEM 3202 Chemistry 3B Additional, 12 credit points

Advice on units of study

A fully detailed information booklet on the units of study and textbooks is available from the School of Chemistry. All students who intend to take Senior Chemistry units of study

must register in the School of Chemistry during either the Wednesday or Thursday of the orientation period. Registration includes selection of Senior Chemistry modules, completion of a registration card and the taking of an I.D. photograph.

CHEM 3101 Chemistry 3A

12 credit points

Offered: February. **Qualifying:** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Prohibition:** May not be counted with CHEM 3901 (but may be counted with CHEM 3201). **Classes:** 4 lec & 8hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

The lectures will be presented in modules (each module runs for a semester and comprises 13 lectures). A listing of the module titles offered in the March Semester in 2000 is given below. There are some restrictions on the number of modules that a student can take from each area. In addition, the seven lecture course on Chemical Laboratory Practices is compulsory. Further details can be obtained from the Senior Chemistry Handbook available from the School.

Inorganic Chemistry

- 311F Transition Metal Chemistry and Inorganic Reaction Mechanisms
- 312F Biological, Environmental and Industrial Chemistry of the Main Group
- 313F Organometallic Chemistry and Catalysis

Organic Chemistry

- 301F Spectroscopic Identification of Organic Compounds
- 302F Stereochemistry and Mechanism
- 304F Bioorganic Chemistry

Physical/Theoretical Chemistry

- 3PT1F Quantum Chemistry
- 3PT3F Chemical Dynamics
- 3PT7F Surfaces and Colloids

Cross Disciplinary

- 3C2F Symmetry and Spectroscopy.

There may be some interchange of modules between CHEM 3101 and CHEM 3102. As well, some modules may not be offered.

Practical: Practical work (8 hours/week) comprises sessions in the inorganic, organic and physical chemistry laboratories. Details can be obtained from the School of Chemistry.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry.

CHEM 3102 Chemistry 3B

12 credit points

Offered: July. **Qualifying:** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Prohibition:** May not be counted with CHEM 3902 (but may be counted with CHEM 3202). **Classes:** 4 lec & 8 hr prac/ wk. **Assessment:** Exam (67%), lab exercises (33%).

The lectures will be presented in modules (each module runs for a semester and comprises 13 lectures). A listing of the module titles offered in the July Semester in 2000 is given below. There are some restrictions on the number of modules that a student can take from each area. The 7-lecture course on Chemical Laboratory Practices is compulsory for those students who did not attend in semester 1. Further details can be obtained from the Senior Chemistry Handbook available from the School.

Inorganic Chemistry

- 314J Biological and Environmental Chemistry of the D-Block Elements
- 315J Inorganic Materials Chemistry
- 317J Forensic and Analytical Chemistry

Organic Chemistry

- 303J Heterocyclic Chemistry
- 305J Medicinal and Biological Chemistry
- 306J Free Radicals and Pericyclics in Synthesis and Nature
- 307J Synthetic Methods

Physical/Theoretical Chemistry

- 3PT4J Atmospheric and Photochemistry
- 3PT5J Biophysical Chemistry
- 3PT6J Polymer Chemistry
- 3PT8J Physical Chemistry of Materials

Cross-Divisional

• 3C1J Supramolecular Chemistry

There may be some interchange of modules between Chemistry 3101 and Chemistry 3102. As well, some modules may not be offered.

Practical: As for CHEM 3101, but the last six weeks comprise of a workshop.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3901 Chemistry 3A (Advanced)

12 credit points

Offered: February. **Qualifying:** Distinction average in CHEM 2001 or 2101 or 2301 or 2901 and in CHEM 2202 or 2302 or 2902; by invitation. **Prohibition:** May not be counted with CHEM 3101 (but may be counted with CHEM 3201). **Classes:** 5 lec & 8hr prac/wk. **Assessment:** As for CHEM 3101, plus a report on each Advanced module. Only the marks for the best 4 out of the total of 5 modules assessed contribute to a student's final mark.

NB: The number of places in this unit of study is limited and entry is by invitation. Applications are invited from students with a high WAM and an excellent record in Intermediate Chemistry. Students in the Faculty of Science Talented Student Program are automatically eligible.

Lectures: The requirements for CHEM 3901 are identical with those for CHEM 3101, with the addition of a special module that is available only to Advanced students. This special module involves an inquiry into a major problem in contemporary chemistry. A member of staff guides the discussion and acts as a consultant.

Advanced topics offered in March semester 2000 were:

New technologies based on supramolecular chemistry - Fact or fiction?

Climate chemistry: Exercises in modelling.

Practical: As for CHEM 3101.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3902 Chemistry 3B (Advanced)

12 credit points

Offered: July. **Qualifying:** Distinction or better in CHEM 2902 or 3101 or 3901; by invitation. **Prohibition:** May not be counted with CHEM 3102. **Classes:** 5.5 lec & 8hr prac/wk. **Assessment:** As for CHEM 3B, plus a report on each Advanced module. Only the marks for the best 4 out of the total of 5 modules assessed contribute to a student's final mark.

NB: The number of places in this unit of study is limited and entry is by invitation. Students in the Faculty of Science Talented Student Program are automatically eligible.

Lectures: The requirements for Chemistry 3B (Advanced) are identical with those for Chemistry 3B, with the addition of a special module that is available only to Advanced students. This special module involves an inquiry into a major problem in contemporary chemistry. A member of staff guides the discussion and acts as a consultant. Advanced topics offered in July semester 2000 were:

Culinary chemistry

Faster, higher, stronger

Practical: As for CHEM 3101.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry.

CHEM 3201 Chemistry 3A Additional

12 credit points

Offered: February. **Qualifying:** CHEM (2001 or 2101 or 2301 or 2502 or 2901) and CHEM (2302 or 2902). **Corequisite:** CHEM 3101 or 3901. **Classes:** 4 lec & 8hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Students taking this unit of study must be concurrently enrolled in or have previously completed either CHEM 3101 or CHEM 3901. The modules will be chosen from the modules listed for CHEM 3101 and the same selection rules as applicable to CHEM 3101 will apply to the selection of the additional 4 mod-

ules. Students cannot take modules already counted towards CHEM 3101 or 3102 or 3901 or 3902 or 3202.

Practical: As for CHEM 3101.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3202 Chemistry 3B Additional

12 credit points

Offered: July. **Qualifying:** CHEM (2001 or 2101 or 2301 or 2502 or 2901) and CHEM (2302 or 2902). **Corequisite:** CHEM 3102 or 3902. **Classes:** 4 lec & 8hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Students taking this unit of study must be concurrently enrolled in or have previously completed either CHEM 3102 or CHEM 3902. The modules will be chosen from the modules listed for CHEM 3102 and the same selection rules as applicable to CHEM 3102 will apply to the selection of the additional 4 modules. Students cannot take modules already counted towards CHEM 3101 or 3102 or 3201 or 3901 or 3902.

Practical: As for CHEM 3101, but the last six weeks comprise a workshop in one of the Divisions.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

Chemistry Honours

Assoc. Prof. M Harding.

The Honours program in the School of Chemistry gives students the opportunity to get involved in a research program in an area that is of interest to them. It provides training in research techniques and experience using modern research instrumentation. The Honours program adds a new dimension to the skills that the students have acquired during their undergraduate years and enhances their immediate employment prospects and, more significantly, their future career potential. All students with a sound record in Chemistry are encouraged to apply for entry to the Honours program. The School of Chemistry offers a wide range of possible projects in the areas of Inorganic Chemistry, Organic Chemistry, Physical Chemistry or Theoretical Chemistry. Details of available projects are contained in the School's Honours Booklet that is available from the School's Information Desk. In the Honours year, each student undertakes a research project under the supervision of a member of staff; writes a thesis which explains the problem, outlines the research undertaken and the results obtained; attends advanced lecture courses, normally given by leaders in their field from overseas or Australia; attends research seminars and undertakes additional written assessment. Further information is available from the Honours Coordinator, from the Administrative Officer (Academic), or at www.chem.usyd.edu.au/honours.html.

Civil Engineering

The Department of Civil Engineering is part of the Faculty of Engineering. In addition to providing professional training in this branch of engineering it offers units of study to students enrolled in the Faculty of Science majoring in Mathematics, Physics, Chemistry, Geology, Computer Science or Soil Science. The most relevant units of study are CTVL 1051 — Statics (5 credit points), CTVL 2201 - Structural Mechanics (6 credit points), CTVL 2205 - Introduction to Structural Design (4 credit points), and CTVL 2204 - Introduction to Structural Concepts (4 credit points). Details regarding these units of study can be obtained from the Faculty of Engineering Handbook.

The above units of study are intended first to demonstrate the application of scientific principles in an engineering context so that the science student will gain an understanding of the engineering behaviour of materials and engineering structures. The second intention is to introduce the application of this understanding to the analysis and design of engineering structures.

As well as the above units of study, Faculty of Science students are invited to enrol in any other civil engineering unit of study, provided they have the appropriate prerequisites.

Double Degree

Some BSc graduates, who have passed all four of the above four units of study within the Department of Civil Engineering, may obtain a Bachelor of Engineering degree in Civil Engineering after an additional two years' study, following the award of the BSc. Students wishing to undertake this option must apply through UAC and compete on the basis of academic merit. Further details regarding admission to the BE in Civil Engineering may be obtained from the Engineering Faculty Office in the Engineering Faculty Building.

Basser Department of Computer Science

The Basser Department of Computer Science Administers the disciplines of Information Systems and Computer Science *Computer Science*

Computer Science is the scientific discipline which has grown out of the use of digital computers to manage and transform information. Computer Science is concerned with the design of computers, their applications in science, government and business, and the formal and theoretical properties which can be shown to characterise these applications.

The diversity of the discipline is demonstrated by current research interests in the Department which include biomedical image processing, parallel and distributed computing, databases, user-adaptive systems and algorithms. The Department has a range of computers and specialised laboratories for its teaching and research.

Note that units of study beginning with both COMP and INFO (but not ISYS) can be counted as Computer Science. Each INFO unit may only be counted to one subject area (either Computer Science or Information Systems, but not both).

Students who intend to major in Computer Science should pay particular attention to the prerequisites of each unit of study. Students who complete 16 credit points of Intermediate units of study (unit of study numbers starting with the digit '2') and 24 credit points of Senior units of study (unit of study numbers starting with the digit '3'), including among them a 'project unit of study' (unit of study numbers starting with the digits '32' and COMP 3809), are eligible to become Associate Members of the Australian Computer Society.

Intending Honours students are strongly urged to complete some Senior Mathematics prior to their entry into the Honours year. Students should note that entry to Honours requires an average of Credit or better in the Senior Computer Science units of study.

Information Systems

Information Systems studies people and organisations to determine and deliver their technological needs. Hence Information Systems encompasses issues such as strategic planning, system development, system implementation, operational management, end-user needs and education. Information Systems study is related to Computer Science but there is an important distinction in that Information Systems is about the architecture of computer systems and making them work for people, hence people are the focus of attention, whereas much of Computer Science is about developing and improving the performance of computers. The Department performs IS research in a number of areas including natural language processing, data mining, knowledge management and workflow methods. Students who wish to complete a major in Information Systems need to appreciate that effective communication and critical analysis are important parts of the curriculum and though taught explicitly in one unit ARIN 1000 (or an equivalent unit) are expected to be practised throughout all units of study. Intending Honours students need to complete at least 16 credit points of Information systems

units at Senior level. Note that units beginning with both ISYS and INFO codes (but not COMP) can be counted as Information systems units.

Other information

The units of study offered by the Department are described briefly below, and more fully in the Department's Handbook which is available from the Department Office (Room G71) in the Madsen Building. Students should confirm details of units of study, registration procedures, textbooks, etc., on the Departmental noticeboards. Those in doubt should seek advice from members of the Department's academic staff.

Summer School: January-February.

This School offers some units of study in The Sydney Summer School. Consult The Sydney Summer School web site for more information: www.usyd.edu.au/summerschool

Computer Science Junior units of study

COMP 1001 Introductory Programming

6 credit points

Offered: February, July. **Corequisite:** Students intending to major in Computer Science are advised to enrol in MATH 1003 and 1004 or 1004 and 1005 or 1903 and 1904 or 1904 and 1905 in their first year. **Assumed knowledge:** HSC 3-unit Mathematics. **Prohibition:** May not be counted with COMP 1901. **Classes:** 1 lec, 2 tut & 3 prac/wk. **Assessment:** Assessment assignments, written exam, prac exam.

This unit of study introduces the fundamental skill that underlines all of Computer Science: computer programming. Using the Java object-oriented programming language, students learn modern programming techniques based on recent developments in the subject. No previous knowledge of computers or programming is assumed.

COMP 1901 Introductory Programming (Advanced)

6 credit points

Offered: February, July. **Assumed knowledge:** HSC 3-unit Mathematics (Requires permission by the Head of Department). **Prohibition:** May not be counted with COMP 1001. **Classes:** 1 lec, 2 tut & 3 prac/wk. **Assessment:** Assessment assignments, written exam, prac exam.

This unit of study is the advanced alternative to COMP 1001. While the subject matter is the same, a higher degree of elegance and rigour in programming is expected, and the programming problems are more challenging, although not more time consuming. No previous knowledge of computers or programming is assumed.

COMP 1002 Introductory Computer Science

6 credit points

Offered: February, July. **Prerequisite:** COMP 1001 or 1901. **Prohibition:** May not be counted with COMP 1902. **Classes:** 1 lec, 2 tut & 3 prac/wk. **Assessment:** Assessment assignments, written exam, prac exam.

This unit of study is a continuation of COMP 1001. Advanced features of the programming language Java are presented, and a beginning is made on some topics from the wider field of Computer Science, such as parsing and reasoning about the correctness and efficiency of computer programs.

COMP 1902 Introductory Computer Science (Advanced)

6 credit points

Offered: February, July. **Prerequisite:** Distinction in COMP 1901 or 1001. **Prohibition:** May not be counted with COMP 1002. **Classes:** 1 lec, 2 tut & 3 prac/wk. **Assessment:** Assessment assignments, written exam, prac exam.

This unit of study is the advanced alternative to COMP 1002. While the subject matter is the same, a higher degree of elegance and rigour in programming is expected, the programming problems are more challenging although not more time consuming, and a deeper approach is taken to the Computer Science topics.

INF01000 Information Technology Tools

6 credit points

Offered: February, July. Classes: 2 lec, 1 tut & 3 prac/wk.

Assessment: Assignments, written exam, prac exam.

The development of Information Technology has led to an extensive interest in using computers for decision making support in organisational and business activities. This in turn has fuelled the need for an organised approach to the introduction, implementation and management of information systems. The IT mechanisms available for decision making and the principles of information systems will be presented. Sophisticated use of widespread productivity tools, such as spreadsheets, Internet, web browsers and databases, along with a critical analysis of their suitability to given tasks will be an important aspect of this unit. Management of information systems is also introduced in order to appreciate the strategic roles these systems and tools play in today's businesses and organisations.

NOTE: Students intending to proceed to professional credentials in Computer Science should enrol in COMP 1001 in their first semester, and in COMP 1002 in their second semester. If they wish they may also enrol in INFO 1000.

Computer Science and Information Systems Intermediate units of study

COMP 2001 Computer Systems

4 credit points

Offered: February. Qualifying: COMP 1002 or 1902. Prohibition:

May not be counted with COMP 2901. Classes: 2 lec, 2 prac/wk.

Assessment: Assessment assignments, written exam.

NB: See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

An overview of the aspects of computer hardware that are important for understanding the function and performance of software. The unit of study consists of two principal components. Machine Principles: in this section we discuss the organisation of a computer central processing unit, CPU, and the assembly and machine language commands that control it. We also pay particular attention to the different data types supported, such as two's complement integers and floating point. System Structures: in this section we discuss the low-level organisation of system software including the organisation and action of a simple compiler and its run-time environment, and the system call and interrupt handling mechanisms. Performance estimation is a unifying theme. Throughout the unit of study, we emphasise generic skills such as report writing and transfer of concepts to new situations.

See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

COMP 2901 Computer Systems (Advanced)

4 credit points

Offered: February. Qualifying: Distinction in COMP 1902 or 1002.

Prohibition: May not be counted with COMP 2001. Classes: 2 lec,

2 prac/wk. Assessment: Assessment assignments, written exam.

This unit of study is the advanced alternative to COMP 2001. Topics in Computer Systems are covered at an advanced and more challenging level.

COMP 2002 Design and Data Structures

4 credit points

Offered: February. Qualifying: COMP 1002 or 1902. Prohibition:

May not be counted with COMP 2902. Classes: 2 lec & 2 prac/wk.

Assessment: Assessment assignments, written exam.

NB: See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

When there is a large amount of data, its structure (arrangement) determines what operations can be done with it efficiently. For example, the Sydney phone directory may be used to find out a subscriber's phone number, but not which subscriber has a given number. Many data structures have been developed over the years, each suited to a particular set of operations. Object-oriented programmers often make use of class libraries which contain implementations of important data structures. This unit of study is concerned with the most frequently used data structures,

from both the view of a programmer who uses a library of collection classes, and also the programmer who writes the library. This unit of study covers the most frequently used structures, including the array, linked list, binary tree, B-tree, hash table, heap, and adjacency lists. Particular attention is given to understanding the correctness and scalability of different structures. Examples will be in several languages including Java.

See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

COMP 2902 Design and Data Structures (Advanced)

4 credit points

Offered: February. Qualifying: Distinction in COMP 1902 or 1002.

Prohibition: May not be counted with COMP 2002. Classes: 2 lec

& 2 prac/wk. Assessment: Assessment assignments, written exam.

This unit of study is the advanced alternative to COMP 2002. Topics in Data Structures are covered at an advanced and more challenging level.

COMP 2003 Languages and Logic

4 credit points

Offered: July. Qualifying: COMP 1002 or 1902. Prerequisite:

MATH 1004 or 1904 or Econometrics or MATH 2009. Prohibition:

May not be counted with COMP 2903. Classes: 2 lec & 1 tut/wk.

Assessment: Assessment assignments, written exam.

NB: See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

All communication requires a language. People communicate with each other in a natural language such as English; they communicate with computers in a formal language such as Java. This unit of study looks at two important kinds of formal languages (called regular and context-free), and the algorithms, or automata, that are used to recognise them. On the theoretical side, several ways to represent languages are presented, and their capabilities and limitations discovered; on the practical side, sound and indeed foolproof methods are derived for writing programs to recognise formal languages such as Java. Considerable emphasis is also put on the use of logic (both propositional and first-order), which provides a powerful design tool for hardware implementations of automata.

See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

COMP 2903 Languages and Logic (Advanced)

4 credit points

Offered: July. Qualifying: Distinction in COMP 1902 or 1002.

Prerequisite: MATH 1004 or 1904 or Econometrics or MATH 2009.

Prohibition: May not be counted with COMP 2003. Classes: 2 lec

& 1 tut/wk. Assessment: Assessment assignments, written exam.

This unit of study is the advanced alternative to COMP 2003. Topics in Languages and Logic are covered at an advanced and more challenging level.

COMP 2004 Programming Practice

4 credit points

Offered: July. Qualifying: COMP 1002 or 1902. Prohibition: May

not be counted with COMP 2904. Classes: 2 lec & 2 prac/wk.

Assessment: Assessment assignments, written exam.

NB: See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

In this unit of study we attack the task of the programmer from an engineering viewpoint. This means that a major focus is on using existing tools as building blocks to complete a task. This unit of study will teach C++ programming, its idiom and its considerable array of powerful programming tools. In addition, students will study the implementation of some of the library tools so that they gain an appreciation of how much better these are than a typical programmer would be able to create. In addition, it will introduce students to some of the very elegant ideas from computer science that have been applied in the construction of the tools.

See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook.

COMP 2904 Programming Practice (Advanced)

4 credit points

Offered: July. Qualifying: Distinction in COMP 1902 or 1002.

Prohibition: May not be counted with COMP 2004. Classes: 2 lec & 2 prac/wk. Assessment: Assessment assignments, written exam. This unit of study is the advanced alternative to COMP 2004. Topics in Programming Practice are covered at an advanced and more challenging level.

INFO 2000 System Analysis and Design

4 credit points

Offered: February. Qualifying: INFO 1000 or COMP 1000 or 1001 or 1901 or COMP 1002 or 1902. Prohibition: May not be counted with COMP 2000. Classes: 2 lec and 1 tut or 1 prac/wk; 1 unscheduled lab work with a CASE tool. Assessment: Written and practical assignments + written exam.

The syllabus covers data-centred, process-oriented and object-centred methodologies for requirements analysis and system description to address organisational needs, including the gathering of facts, diagnosis of problems, recommendation of appropriate and feasible solutions. A CASE tool will be used to develop practical skills.

IN FO 2005 Personal Database Tools

4 credit points

Offered: July. Qualifying: INFO 1000 or COMP 1000 or 1001 or 1901 or COMP 1002 or 1902. Prohibition: Not available to students who have completed COMP 3005 or 3905 or COMP 2005. Classes: 2 lec, 1 tut/wk; 1 unscheduled lab work. Assessment: Written and practical assignments + written exam.

The syllabus covers use of databases through forms and through SQL language; data representation and basic interfaces; good design of tables through normalisation. Use of a variety of data modelling techniques. A commercial strength PC based database system will be used to develop practical skills.

INFO 2007 Distributed Information Systems

4 credit points

Offered: July. Qualifying: INFO 2000 or ISYS 2006. Classes: 2 lec, 2 prac/wk. Assessment: One 2hr examination, written assignments. This unit of study covers both networking technologies and design of distributed applications. Emphasis is on the analysis and design of effective solutions and patterns to business issues. Students learn to evaluate and select appropriate technologies and configurations. Major topics include: communications media and techniques; network topologies, devices and standards; distributed system architectures such as client/server and the Internet; design and management for integrity, reliability and security; and, business applications.

ISYS 2006 Information Systems in Organisations

4 credit points

Offered: February. Qualifying: COMP 1001 or 1901 or 1002 or 1902 or INFO 1000. Assumed knowledge: Use of basic PC tools such as spreadsheets, Internet, email and word processing software. Classes: 2 lec & 1 tut/wk. Assessment: One 2hr examination, written assignments.

The syllabus provides a critical review of the enabling impact of information systems on business processes. The use of telecommunications and data communications and their applications to distributed information systems, and the management of change due to information technology are discussed in some detail. A key element of this unit is the development of critical analysis and communication skills by students.

Computer Science and Information Systems Senior units of study

Students are advised that doing less than 6 Senior Computer Science units of study is not regarded as adequate preparation for a professional career in computing or for further study. Students are advised to balance their workload between semesters.

COMP 3001 Algorithms

4 credit points

Offered: July. Qualifying: COMP 2002 or 2902. Prerequisite: MATH 1004 or 1904 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. Prohibition: May not be counted with COMP 3901. Classes: 2 lec & 1 tut/wk. Assessment: Assessment assignments, written exam.

Algorithms are particularly important in all areas of Computer Science. The knowledge of basic algorithms, as well as the ability to design a new algorithm and to analyse an existing one in terms of time and space efficiency, are essential for a person to successfully work in a computer and information related professional area. This unit of study will provide a systematic study of the analysis of existing algorithms and strategies for the design of new algorithms. The analysis skill includes the method of analysis of average computational complexity. The design strategies covered include divide-and-conquer, greedy method, and dynamic programming. Many interesting real-life problems and smart algorithm application examples will also be introduced.

COMP 3901 Algorithms (Advanced)

4 credit points

Offered: July. Qualifying: COMP 2002 or 2902. Prerequisite: 16 credit points of Intermediate or Senior Computer Science with Distinction average and MATH 1004 or 1904 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. Prohibition: May not be counted with COMP 3001. Classes: 2 lec & 1 tut/wk. Assessment: Written and programming assignments; written exam.

An advanced alternative to COMP 3001; covers material at an advanced and challenging level.

COMP 3002 Artificial Intelligence

4 credit points

Offered: February. Qualifying: COMP 2004 or 2904. Prerequisite: COMP 2003 or 2903 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. Prohibition: May not be counted with COMP 3902. Classes: 2 lec & 1 tut/wk. Assessment: Assessment assignments, written exam.

Artificial Intelligence is all about programming computers to perform tasks normally associated with intelligent behaviour. Classical AI programs have played games, proved theorems, discovered patterns in data, planned complex assembly sequences and so on. Most of these activities depend on general or 'weak' methods, primarily search. AI also addresses issues related to the representation and use of the knowledge of human experts. This unit of study will explore topics from selected areas of AI. Students who complete it will have an understanding of some of the fundamental methods and algorithms of AI, and an appreciation of how they can be applied to interesting problems. The unit of study will involve a practical component in which some simple problems are solved using standard AI techniques.

COMP 3902 Artificial Intelligence (Advanced)

4 credit points

Offered: February. Qualifying: COMP 2004 or 2904. Prerequisite: 16 credit points of Intermediate or Senior Computer Science with Distinction average and 8 credit points of Intermediate MATH and/or Statistics and/or Econometrics. Prohibition: May not be counted with COMP 3002. Classes: 2 lec & 1 tut/wk. Assessment: Written and programming assignments; written exam.

An advanced alternative to COMP 3002; covers material at an advanced and challenging level.

COMP 3004 Computer Graphics

4 credit points

Offered: July. Qualifying: COMP 2004 or 2904. Prerequisite: COMP 2002 or 2902 and MATH 1002 or 1902 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. Prohibition: May not be counted with COMP 3904. Classes: 2 lec & 1 tut/wk. Assessment: Assessment assignments, written exam. A picture has a million pixels (in round terms). Like any other interface, it must be well engineered for accuracy, high speed-performance and compatibility with user needs. The Computer Graphics unit of study examines established algorithms for picture generation, covering such topics as hidden-line elimination, shading and texturing, and ray-tracing in terms of the technology of standard graphical output devices and the 3-space geometry.

try which applies. The effects on performance of algorithmic design choices are considered and connections are made with the cognate field of computational geometry. Typically in making pictures, a round ball is modelled by the unit sphere $x^2 + y^2 + z^2 = 1$ (after Pythagoras), and a point on a tumbling football by the affine transform $p = A \cdot p' + T$, where A is a non-singular matrix, p' is a point on the unit sphere, and T is a translation vector. The unit of study therefore assumes an understanding of vector and matrix methods.

COM P 3904 Computer Graphics (Advanced)

4 credit points

Offered: July. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and COMP 2002 or 2902 and MATH 1002 or 1902 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition:** May not be counted with COMP 3004. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3004; covers material at an advanced and challenging level.

COMP 3006 Declarative Programming Languages

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition:** May not be counted with COMP 3906. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Assessment assignments, written exam.

What distinguishes Declarative Programming Languages is the way in which programmers specify the logic of a problem (what is to be done) rather than the mechanics of solving the problem (how to do it). It is this aspect that has led to these sorts of languages being extensively used for Artificial Intelligence software systems. In addition, they are also often used for rapid prototyping of novel software systems, and many of the ideas and techniques employed in declarative programming language systems have found broader application.

The unit of study focuses on two languages: Prolog and Lisp. Through a combination of workshops, lectures and assignment students will gain practical skills and come away with significant new tools with Which to tackle future software development projects.

COMP 3906 Declarative Programming Languages (Adv)

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition:** May not be counted with COMP 3006. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3006; covers material at an advanced and challenging level.

COMP 3007 Networked Systems

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** COMP 2001 or 2901 or ELEC 2601. **Prohibition:** May not be counted with COMP 3907. **Classes:** 2 lec & 2 prac/wk. **Assessment:** Assessment assignments, written exam.

This unit of study deals with various aspects of communications and distribution systems. It introduces the concepts of computer communications, it exposes limitations of communications channels, and it identifies network components and the way they fit together to provide communications functions. The unit of study is also a study of network organisations, and of protocols required at different levels for efficient, reliable, secure, and meaningful communications (International Standard Organisation's OSI reference model and protocols). Emphasis, however, is placed on the Internet and TCP/IP protocol suite. Students are expected to be able to write distributed applications based on the client/server model using Remote Procedure Call (RPC). Practical: The practical aspects of the unit of study are centred around a specially designed network laboratory. Experiments aim to provide hands-on experiences on many essential, but difficult aspects of networking.

The unit of study offers a wide range of experiments, from the network physical layer (RS-232), managing Microsoft Windows Networks, basic Unix administration to programming with sockets, remote procedure calls, to writing client/server application, Simple Mail Transfer Protocol (SMTP) application.

COMP 3907 Networked Systems (Advanced)

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and COMP 2001 or 2901 or ELEC 2601.

Prohibition: May not be counted with COMP 3007. **Classes:** 2 lec & 2 prac/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3007; covers material at an advanced and challenging level.

COMP 3008 Object-Oriented Systems

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prohibition:** May not be counted with COMP 3908. **Classes:** 2 lec & 1 tut/wk.

Assessment: Assessment assignments, written exam.

Provides further study of the object-oriented paradigm in all stages of the software lifecycle.

COMP 3908 Object-Oriented Systems (Advanced)

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition:** May not be counted with COMP 3008. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3008; covers material at an advanced and challenging level.

COMP 3009 Operating Systems

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** COMP 2001 or 2901 or ELEC 2601. **Prohibition:** May not be counted with COMP 3909. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Assessment assignments; written exam.

This unit of study provides an introduction to the design and construction of modern operating systems. The emphasis of the unit of study is design and the identification of high-level abstractions. However, the unit of study also has a strong practical component and includes practical exercises which involve the students in implementing components of an operating system. Topics covered include an introduction to concurrency and synchronisation, processes and process scheduling, memory management, virtual memory, file systems and security. The unit of study is not based on a particular operating system, but frequent reference is made to a number of contemporary systems including Unix, Windows NT and MacOS.

COMP 3909 Operating Systems (Advanced)

4 credit points

Offered: February. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average and COMP 2001 or 2901 or ELEC 2601.

Prohibition: May not be counted with COMP 3009. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3009; covers material at an advanced and challenging level.

COMP 3100 Software Engineering

4 credit points

Offered: July. **Prerequisite:** COMP 2004 or 2904. **Prohibition:** May not be counted with COMP 3800. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Assessment assignments, written exam.

Software Engineering is designed to equip students with the knowledge necessary to undertake large software design and implementation tasks in a team environment. Emphasis will be on specification, design, implementation and validation tuned to large applications. Students will learn about current software engineering tools and environments to prepare them for real projects. The contents of this unit of study will include the soft-

ware life cycle, human factors in software engineering, requirements analysis and specification techniques, design methodologies, implementation issues, software tools, validation, verification, quality assurance and software project management issues.

COMP 3800 Software Engineering (Advanced)

4 credit points

Offered: July. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition:** May not be counted with COMP 3100.

Classes: 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3100; covers material at an advanced and challenging level.

COMP 3102 User Interfaces

4 credit points

Offered: July. **Qualifying:** COMP 2004 or 2904. **Prohibition:** May not be counted with COMP 3802. **Classes:** 2 lec & 1 tut/wk.

Assessment: Assessment assignments, written exam.

This unit of study introduces several of the critical elements programmers need to create effective user interfaces. These include the essentially technical skills used in creating several of the major types of interface as well as human and design issues. Critical to designing an effective interface is familiarity with the substantial body of knowledge about cognitive and perceptual constraints. The technical skills of User Interface programming include learning current tools for building interfaces. The unit of study will introduce students to 'web-technology', programming of interfaces in the World-Wide-Web environment, a visual programming environment and the Python scripting language and TK toolkit for building graphical interfaces.

COMP 3802 User Interfaces (Advanced)

4 credit points

Offered: July. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition:** May not be counted with COMP 3102.

Classes: 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to COMP 3102; covers material at an advanced and challenging level.

COMP 3201 Algorithmic Systems Project

4 credit points

Offered: July. **Corequisite:** COMP 3001 or 3901. **Classes:** supervised project. **Assessment:** Assessment quality of software product, written report, product presentation.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204, 3205, 3206 or 3809.

Some of the most exciting work being done in the Algorithms and Complexity area today is concerned with the development of software which applies the algorithms and techniques to practical problems. Much progress has been made recently in graph drawing, computational geometry, timetable construction, etc. Real-life instances of these kinds of problems are typically too large to be solved without using efficient algorithms that have been developed for them. In this unit of study you will work in a group to develop a software product of this kind. Past projects have included graph editors for X-windows, various computational geometry projects, and timetable construction.

COMP 3202 Computer Systems Project

4 credit points

Offered: February, July. **Prerequisite:** COMP 3009 or 3909. **Classes:** supervised project. **Assessment:** Assessment quality of software product, written report, product presentation.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.

Students work in groups on a software project. The aim of the project is to provide substantial practical experience in designing and modifying an operating system. The task will involve extension and modification of an operating system, which itself runs on simulated hardware above Unix. The simulation is very realistic and all of the usual operating system implementation

problems, including synchronisation, memory management, I/O, etc, will be encountered.

COMP 3203 Artificial Intelligence Project

4 credit points

Offered: February. **Corequisite:** COMP 3002 or 3902. **Classes:** supervised project. **Assessment:** Assessment quality of software product, written report, product presentation.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204, 3205, 3206 or 3809.

As with any other applied science, theories and techniques in Artificial Intelligence, regardless of how fancy they appear to be, are of little use by themselves unless they can be used to solve real world problems. Furthermore, they can best be understood and mastered by applying them to non-trivial practical problems. In this project, students will have a chance to write computer programs to solve practical problems in a way "similar" to what intelligent beings do. Specifically, students will be asked to apply learned AI techniques to solve small but realistic and knowledge intensive tasks (e.g., advice-giving, trouble-shooting), in a carefully selected domain; and to evaluate the utility and performance of the techniques used. Students will work in groups.

COMP 3204 Software Engineering Project

4 credit points

Offered: July. **Corequisite:** COMP 3100 or 3800. **Classes:** supervised project. **Assessment:** Assessment quality of software product, written report, product presentation.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204, 3205, 3206 or 3809.

The primary objectives of this module are that students:

- have the opportunity to complete a large and realistic software development task
 - develop skills in defining software requirements in response to an authentic user's needs
 - put into practice state-of-the-art techniques for developing quality software and record these processes in reports
 - develop skills in working in software teams
 - evaluate the quality of the software developed
- Students will produce several products:
- a requirements document
 - evaluation of a product in terms of user needs and the report of testing the software
 - produce a report to the client on what has been achieved
 - a software product with supporting documentation, in a form suitable to hand over to the client
 - a poster outlining the project and highlighting its achievements

COMP 3205 Product Development Project

4 credit points

Offered: February, July. **Prerequisite:** COMP 3008 or 3908.

Classes: supervised project. **Assessment:** Assessment quality of software product, written report, product presentation.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.

The Product Development Project consists of working, as a member of a group of four students, in the specification, design, implementation and testing of a substantial software product, using sophisticated techniques including object-oriented programming. The product is often intended for users elsewhere in the University or in the Department, and an important aspect is discussion with eventual users to determine their needs. The unit of study has three aims. Firstly, students learn to use previously gained implementation, testing, and debugging skills in the realisation of a complete, practical product. Secondly, the importance of careful specification, design and project management to successful completion of a product by a cooperating team is made manifest. Thirdly, students learn to take responsibility for a project and work independently of detailed supervision under the demanding 'sink or swim' conditions of real software development.

COMP3206 Bioinformatics Project

4 credit points

Offered: July. **Qualifying:** COMP 2004 or 2904. **Prerequisite:** 8 credit points of Senior Computer Science (including COMP 3008 or 3100 or 3908 or 3800) and 16 credit points of Intermediate Biology, Biochemistry and/or Pharmacology. **Classes:** weekly meeting with supervisor plus project work; 3-4 introductory lectures.

Assessment: Quality of software and documentation produced; quality of process; student's written evaluation of outcome.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204, 3205, 3206 or 3809.

Students work in groups to design and develop software that will be useful to practitioners in biosciences.

COMP 3809 Software Project (Advanced)

4 credit points

Offered: February, July. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science, with Distinction average.

Corequisite: 8 credit points of Senior Computer Science. **Classes:** 30 mins/week meeting with project supervisor; 3-4 introductory talks; private work on the project. **Assessment:** Based on quality of the software and documentation produced, and the process by which it is produced, and the student's written reflections on the outcome.

NB: Students intending to major in Computer Science are advised to enrol in one of COMP 3201, 3202, 3203, 3204, 3205, 3206 or 3809.

This unit of study involves students in producing innovative software to support activity in a research or advanced development project, either within the university or in industry.

INFO 3005 Organisational Database Systems

4 credit points

Offered: February. **Qualifying:** INFO 2005 or COMP 2005.

Prohibition: May not be counted with INFO 3905 or COMP 3005 or COMP 3905. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Assessment assignments, written exam.

Large organisations store lots of essential data in central repositories from which many users can access it. This unit covers the development of client-server systems which access shared data in a DBMS. It also deals with the responsibilities of the Database Administrator who must organise the physical structures to make access efficient, and who must also guard the integrity of the data.

INFO 3905 Organisational Database Systems (Adv)

4 credit points

Offered: February. **Qualifying:** INFO 2005. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science units of study with Distinction average. **Prohibition:** May not be counted with COMP 3005 or COMP 3905 or INFO 3005. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Written and programming assignments; written exam.

An advanced alternative to INFO 3005; covers material at an advanced and challenging level.

ISYS 3000 Information Systems Management

4 credit points

Offered: July. **Qualifying:** INFO 2000 or COMP 2000 or ISYS 2006. **Classes:** 2 lec, 1 tut/wk; 1 unscheduled lab work. **Assessment:** Written and practical assignments and written exam.

The syllabus covers applications in business and management, managing information technology, planning and implementation of information systems, end user computing, system approach, strategic planning, operations management, control and audit and quality management, strategic information systems.

ISYS 3012 Project Management and Practice

4 credit points

Offered: February. **Qualifying:** INFO 2000. **Classes:** 2hr lec, 1 prac & 1hr independent study/wk. **Assessment:** One 2hr examination, written assignments.

This unit of study covers the factors necessary for successful management of system development or enhancement projects. Both technical and behavioural aspects of project management are discussed with a focus on management of development for enterprise-level systems. Major topics include managing the sys-

tem life cycle, system and database integration issues, network and client-server management, system performance evaluation, managing expectations of team members, cost-effectiveness analysis, and change management.

ISYS 3015 Analytical Methods for IS Professionals

4 credit points

Offered: February. **Qualifying:** ISYS 2006 (or ARIN 1000 for BCST and BA Informatics students) and 24 credit points of Intermediate units of study including 8 credit points from INFO or ISYS units of study. **Classes:** 2hr lec & 1 prac/wk. **Assessment:** One 3hr examination, written assignments.

A collection of different methods for collecting and analysing information will be studied in the context of a systems thinking approach to investigative research. These approaches include participative methods, surveys, focus groups, controlled experiments and case studies.

ISYS 3113 Arts Informatics Systems

4 credit points

Offered: February. **Qualifying:** INFO 2005. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Examination and written assignments.

A variety of topics relevant to the text and image processing needs of the Arts and Social Sciences such as scripting languages, text retrieval, natural language processing, applied artificial intelligence, and multi media techniques in the context of data distributed in databases across networks.

ISYS 3207 Information Systems Project

8 credit points

Offered: July. **Qualifying:** ISYS 3015 or ARIN 2000. **Prerequisite:** INFO 3005 or ISYS 3000 or 3012 or 3113. **Classes:** 1 hr lec/wk.

Assessment: Written project report and presentation.

The objective is to enable students to design and implement a solution to a complex data processing problem or to investigate an issue in the management or development of a real-world information system. The project consists of students working together in teams to complete a task of adequate complexity that draws on their education in Information Systems to date. The project will either investigate an issue that is important to the successful practice of the management of Information systems including topics in such areas as end-user computing, IS methodologies, business process re-engineering. Alternatively, it will follow through the life-cycle of systems creation and development and delivery using the traditional tools and methods of the systems analyst.

Computer Science Honours

To be awarded Honours in Computer Science, a student must complete units of study to a total of 48 credit points, as approved by the Department and the Faculty, as follows: 8 credit points of research preparation, covering a literature review and research plan, 16 credit points of research project, and 24 credit points of coursework units of study, which, except with permission of the Department and Faculty, must all be from 4000-level units of study which are in the subject area of Computer Science (that is, units of study which have codes starting with COMP or INFO).

Note that the Faculty requires that Honours be completed in two consecutive semesters of full-time study, or four consecutive semesters of part-time study; individual results for separate units of study will not appear on the transcript, instead a single final grade and mark is given for the Honours course, as determined by the Faculty based on performance in Honours and in prior undergraduate study.

COMP 4301 Algorithms (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3001. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Algorithms.

This would build on the broad survey provided by COMP 3001. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: parallel algorithms, randomised algorithms, approximation algorithms for intractable problems.

COMP 4302 Artificial Intelligence

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3002.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Artificial Intelligence. This would build on the broad survey provided by COMP 3002. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: Machine Learning, Natural Language Processing, Non-monotonic reasoning.

COMP 4304 Graphics (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3004.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Graphics. This would build on the broad survey provided by COMP 3004. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: three-dimensional rendering, constraint-maintenance image systems.

COMP 4305 Networked Systems (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3007.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Networked Systems. This would build on the broad survey provided by COMP 3007. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: network management and performance tuning, internet-working, implementation of network protocols.

COMP 4307 Distributed Systems (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3007 or

Credit in COMP 3009. **Classes:** 2hrs lec & 1hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Distributed Systems. This would build on ideas of networks or operating systems provided in the prerequisites. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and exper-

tise. Example topics include: electronic commerce, distributed operating systems, security in distributed systems.

COMP 4309 Object-Oriented Systems (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3008.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Object-Oriented Systems. This would build on the broad survey provided by COMP 3008. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: distributed object systems, implementation of object-oriented languages, type theory for object languages.

COMP 4400 Operating Systems (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3009.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Operating Systems. This would build on the broad survey provided by COMP 3009. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: system administration, process group infrastructure, modern kernel internals.

COMP 4401 Software Engineering (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3100.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Software Engineering. This would build on the broad survey provided by COMP 3100. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: software metrics, tools for CASE, software architecture description.

COMP 4402 User Interfaces (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 3102.

Classes: 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of User Interfaces. This would build on the broad survey provided by COMP 3102. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: user-adaptive systems, information filtering, usability testing.

COMP 4403 Computation Theory (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in COMP 2003 and 8 credit points of Intermediate Mathematics. **Classes:** 2hrs lec & 1hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.
NB: This unit may be available in February or July semester; it may not always be offered.

To develop understanding of the theoretical limits of computation, and the proof techniques used to show these limits in specific problems. Syllabus Summary: Computability; models of computation and their relationships; recursive sets and recursively enumerable sets; Godel incompleteness theorem; halting problem; complexity theory; speed-up theorems; reductions; NP-completeness.

COM P 4404 Scientific Visualisation (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in one of: COMP 3001 or COMP 3304 or PHYS 3303. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.
NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Scientific Visualisation. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: medical imaging and simulation.

COMP 4601 Advances in Computer Science 1

4 credit points

Offered: February, July. **Prerequisite:** Permission of Head of Department. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.
NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Computing. This unit is used when a student wants to take a further topic within a field which has already been studied at 4000-level. Head will not grant permission unless the topic being taught is substantially different from those studied previously.

COMP 4602 Advances in Computer Science 2

4 credit points

Offered: February, July. **Prerequisite:** Permission of Head of Department. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.
NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Computing. This unit is used when a student wants to take a further topic within a field which has already been studied at 4000-level. Head will not grant permission unless the topic being taught is substantially different from those studied previously.

COMP 4603 Advances in Computer Science 3

4 credit points

Offered: February, July. **Prerequisite:** Permission of Head of Department. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.
NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Computing. This unit is used when a student wants to take a further topic within a field which has already been studied at 4000-level. Head will not grant permission unless the topic being taught is substantially different from those studied previously.

COMP 4604 Advances in Computer Science 4

4 credit points

Offered: February, July. **Prerequisite:** Permission of Head of Department. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Computing. This unit is used when a student wants to take a further topic within a field which has already been studied at 4000-level. Head will not grant permission unless the topic being taught is substantially different from those studied previously.

INFO 4300 Information Systems (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in ISYS 3000. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Information Systems. This would build on the broad survey provided by ISYS 3000. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: management of change in organisations, soft systems analysis, workflow management.

IN FO 4306 Database Systems (Advanced Topic)

4 credit points

Offered: February, July. **Prerequisite:** Credit in INFO 3005. **Classes:** 2hrs lec & 1 hr tutorial or lab/wk. **Assessment:** Written and practical assignments (individually and/or in small groups) and a final examination.

NB: This unit may be available in February or July semester; it may not always be offered.

To develop knowledge of the concepts, and mastery of the techniques, in one specialist topic within the field of Database Systems. This would build on the broad survey provided by COMP 3005. The coverage would be at the level of an professional monograph, or papers from the research literature. The specific topic covered would vary from one offering to another, depending on staff interest and expertise. Example topics include: transaction processing monitors, advanced conceptual modelling, object-oriented databases.

INFO 4901 Research Preparation

8 credit points

Offered: February, July. **Prerequisite:** Permission of Head of Department.

This unit involves the preparation needed for a significant project of research. A weekly lecture covers topics such as use of literature, structure of a thesis, evaluation of research claims. Students are required to produce three main contributions.

- A literature review:

This must give a thoughtful and integrated account of the relevant prior work, as normally found in a thesis chapter. Assessment will be based on both the thoroughness of the coverage and on the understanding of the purpose and prior work.

- Research Plan and Project requirements:

For a system or product type project, the specifications are similar to those defined in software engineering. For a theoretical type of project, this really means a "critical analysis of the problem, identification of the problem and definition of the problem". Assessment is based on the appropriateness of the work as a basis for a successful honours project

- Initial progress:

The nature of this progress should be negotiated with the project supervisor, but it could be, for example, a prototype implementation, derivation of existing results, or an experimental setup (eg. a simulation environment).

INFO 4902 Research Project

16 credit points

Offered: February, July. **Prerequisite:** Permission of Head of Department.

This unit represents the completion of the project of supervised research, whose initial planning was done in INFO 4901. The main outcome is a thesis (usually about 50 pages long), which describes the purpose of the work, the background and prior results, what was accomplished, the evidence you have collected for the success of the project, and what further work might be worthwhile. For the most successful projects, it is reasonable that the thesis will form the basis of publications in the research literature.

INFO 4999 Computer Science Honours Result

0 credit points

Offered: February, July. **Prerequisite:** Permission of the Head of Department.

All students in Computer Science Honours must enrol in this non assessable unit of study in their final semester.

Information Systems Honours

Information Systems Honours consists of coursework and a project. The project involves a substantial development or investigation task generally in support of the department's research effort. It provides training in investigating the history of the body of knowledge that encompasses a conceptual problem space, defining a complex task to tackle the problem, and then taking the task to completion. Students receive an education in moving through a problem from its inception to its completion so that they gain the confidence and experience to tackle independently significant research and industrial projects. Research areas in the Department include natural language processing, data mining, systems methodologies and Workflow methods. Students are required to participate in Departmental seminars as part of their coursework and in all other activities of the Department. They are provided with office accommodation and laboratory facilities and may be employed for a few hours per week in undergraduate teaching.

For further details consult the Departmental Handbook and the Honours Guide Book.

School of Geosciences

The School of Geosciences includes three discipline areas with separate unit of study codes: Geography (GEOG), Geology (GEOL) and Geophysics (GEOP). Students may major in any one of the three areas. The School is located in the Edgeworth David Building (Geology and Geophysics) and in the Madsen Building (Geography).

Geography

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

As theoretical understanding and quantitative precision have advanced, geography has developed as an important 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.

Tutorials and practical work

First year students must attend one three-hour practical session each week (see timetable). All students in second and third years are required to attend tutorials and/or designated practical sessions each week.

Assigned work and examinations

In Junior, Intermediate and Senior units of study, assignments contribute significantly to final marks.

Conducted field excursions

Students in Junior units of study are required to attend two one-day excursions to localities within about 150km of Sydney. In Intermediate and Senior units of study, 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 Geography.

Geography handbook

Further details of activities, units of study, excursions, and other relevant material are contained in the Geography Handbook available from the Enquiry Office in the Madsen Building.

Note: Some units of study may be rescheduled to allow for expected staff changes.

Geography Junior units of study

Geography offers two Junior units of study: Geography 1001 in the February Semester and Geography 1002 in the July Semester. Both units of study consist of three lectures and three hours of laboratory work a week. Morning lectures are repeated in the afternoon. All students do the same unit of study.

Summer School: January-February.

Geography offers some units of study in The Sydney Summer School. Consult The Sydney Summer School web site for more information: www.usyd.edu.au/summerschool

GEOG 1001 Biophysical Environments

6 credit points

Assoc. Prof. Short, Dr Gale

Offered: February. **Classes:** 3 lec & 3hr prac/wk. **Assessment:** One 2hr exam, 1500w report, prac assignments.

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

Practical: Field excursion one half day/sem.

GEOG 1002 Human Environments

6 credit points

Assoc. Prof. Connell & Dr W Pritchard

Offered: July, January (short). **Classes:** 3 lec & 3hr prac/wk.

Assessment: One 3hr exam, 2000w essay, prac exercises.

Environmental and Human Geography develops understanding of processes and consequences of interactions among people and between people and their environments. Questions, challenges

and issues that stem from the relationships and transformations in the built, natural, social and spatial environments are introduced and scrutinised. Social structures and development are explored and principles of human geography are presented through study of the location and distribution of economic activities with special reference to Australia and the Asia-Pacific region.

Geography Intermediate units of study

The Department offers seven Intermediate units of study in 3 streams - namely geomorphology, environmental geography and human geography. The streams and their units of study are:

Geomorphology - Geography 2001, 2002 and 2302

Environmental - Geography 2101 and 2102

Human - Geography 2201 and 2202

Each unit of study consists of three lectures and the equivalent of five hours assigned work (which may comprise of tutorials, practicals, individual course work and/or field work). 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 of study hold two to three such excursions.

Students who have completed the Junior Geography and Junior Environmental Science prerequisites may elect to do units of study in one or two of these streams.

To complete Intermediate Geography, a student must select two Intermediate Geography units of study. Each unit of study is 8 credit points. A student would normally select two sequential units of study from one of the three streams (Geomorphology, Environmental, Human). However, students may vary the sequence of units of study between streams and options within units of study with the permission of the Head of Department. Not all units of study may be offered in any given year.

Special Geography Sequence (Science students)

A candidate who has completed 36 Junior credit points including 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken Geography 1001 or 1002 may apply to the department for permission to enrol in any Intermediate Geography unit of study.

The Department of Geography is not normally prepared to support such applications to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed six Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study.

GEOG 2001 Processes in Geomorphology

8 credit points

Associate Professor D Dragovich

Offered: February. **Prerequisite:** 36 credit points of Junior units of study, including GEOG 1001 or ENV11001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. **Classes:** 3 lec & 5 prac or field/wk. **Assessment:** One 2hr exam or 1500w essay or prac papers.

NB: A candidate who has completed 36 Junior credit points including 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken Geography 1001 or 1002 may apply to the department for permission to enrol in any Intermediate Geography unit of study. The Department of Geography is not normally prepared to support such applications to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed six Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study.

Geomorphology stream: This unit of study is concerned with the geomorphology of global environments, as mega-landforms and the processes that shape them. The major focus is on continental-scale landforms and the long term processes which shape

the physical platform which is the home, workplace and exploitation surface of humankind.

GEOG 2002 Fluvial and Coastal Geography

8 credit points

Dr P Cowell & Mr G Doyle

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

NB: Other Information: As for GEOG 2001.

Physical Geography stream: This unit of study focuses not on global, but meso- and micro-scales on two of the major 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 2101 Environmental Change and Human Response

8 credit points

Associate Professor D Dragovich & Dr Chapman

Offered: February. **Prerequisite:** 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENV11001 or 1002.

Classes: 3 lec & 2 prac & field/wk. **Assessment:** One 3hr exam, 1500w essay or prac reports.

NB: Other Information: As for GEOG 2001.

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

GEOG 2102 Resource and Environmental Management

8 credit points

Dr Hirsch and Dr McManus

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

NB: Other Information: As for GEOG 2001.

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

GEOG 2201 Cultural and Economic Geography

8 credit points

Assoc Prof Connell, Dr W Pritchard.

Offered: February. **Prerequisite:** 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1002 or ECOP 1001 or 1002. **Classes:** 3 lec & 5hr tut or prac or fieldwork/wk.

Assessment: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

NB: Other Information: As for GEOG 2001.

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

GEOG2202 Urban and Political Geography

8 credit points
Prof E Waddell.

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

NB: Other Information: As for GEOG 2001.

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

GEOG 2302 Fluvial Geomorphology

6 credit points
Dr Gavin Doyle.

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

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

Geography Senior units of study

Geography offers seven Senior units of study in 3 streams - namely geomorphology, environmental geography and human geography. The streams and their units of study are:

Geomorphology - Geography 3001 and 3002

Environmental - Geography 3101 and 3102

Human - Geography 3201, 3202 and 3302

Each unit of study consists of three lectures and the equivalent of nine hours assigned work (which may consist of tutorials, practicals, individual course work and/or field work) per week. 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 of study hold two to three such excursions.

Students who have completed the Intermediate Geography prerequisites may elect to do units of study in one or two of these streams.

To complete Senior Geography, a student must select two units of study. Each unit of study is 12 credit points. A student would normally select two sequential units of study from one of the three streams (Geomorphology, Environmental and

Human). However, students may vary the sequence of units of study between streams and options within units of study with the permission of the Head of Department. Not all units of study may be offered in any given year.

Geography Senior Unit of Study Combinations

48 credit points

Students may elect to do four Senior units of study (12 credit points each) in the one year, giving a total of 48 credit points. Such students will be required to enrol in two of the Senior Geography Streams, Geomorphology, Environmental or Human. Those who have passed at least two of the Senior Geography units of study at Honours level may proceed to an appropriate unit of study in Geography Honours. Those choosing physical topics must have majored in the Geomorphology stream units of study; they may elect to do either Geography or Geomorphology Honours.

GEOG 3001 Coastal Environments and Dynamics

12 credit points

Assoc. Prof. Short, Dr Cowell

Offered: February. **Prerequisite:** GEOG 2001 or 2002 or 2101 or MARS 2002. **Classes:** 3 lec & 6hr prac or field/wk. **Assessment:** One 2hr exam, two 1500w essays, prac reports.

Senior Geomorphology stream

This unit of study examines the marine, terrestrial and atmospheric components that contribute to the formation and the nature of coastal environments, with particular emphasis on Australian coastal systems. It goes on to focus on the general principles of morphodynamic adjustment to changes in coastal boundary components and their impact on the inner shelf, shoreface and estuaries. The field excursions are closely linked to the unit of study and practical work.

Practical: Field excursion one 1-day, two 3-day.

GEOG 3002 Environmental Geomorphology

12 credit points

Assoc. Prof. D Dragovich, Dr S Gale.

Offered: July. **Prerequisite:** GEOG 2001 or 2002 or 2101. **Classes:** 3 lec & 6 prac or field/wk. **Assessment:** One 2hr exam, two 1500w essays, prac and field reports.

Senior Geomorphology stream

One component of this unit of study deals with the effects of weathering on the physical and the built environment, and considers the relationship between soils and landforms. This part of the unit may be taken with soil science. The other component deals with environmental change in Australia and the interrelationship of people with the Australian environment.

GEOG 3101 Catchment Management

12 credit points

Lecturers to be determined

Offered: February. **Prerequisite:** GEOG 2001 or 2002 or 2101 and GEOG 2102 or 2201 or 2202. **Classes:** 3 lec & 1 tut & 8 prac or field/wk. **Assessment:** One 2hr exam, two 1500w essays.

Senior Environmental stream

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

GEOG 3102 Coastal Management and GIS

12 credit points

Dr Chapman, Dr Cowell

Offered: July. **Prerequisite:** GEOG 2001 or 2002 or 2101 or MARS 2002. **Classes:** 3 lec & 6 prac or field/wk. **Assessment:** One 2hr exam, two 1500w essay, prac or reports.

Senior Environmental Geomorphology stream

The coastal zone provides an ideal area for the study of resources management, since virtually all the central concerns of resources management are exemplified in that zone. Hence, the structure of this unit of study will be determined by these concerns, with the application to the coastal zone providing the central unifying theme. The unit of study first addresses critical physical systems and natural hazards in the coastal zone, and the ways in which decisions are made about resources management. The unit of study then applies geographical information systems in environmental assessment and management of coastal drainage catchments. It focuses on the development and application of GIS models for strategic planning and is structured around a field exercise in location-analysis within a coastal catchment. Practical work involves extensive use of computers. Practical: Field excursion one 2-day.

GEOG3201 Asia-Pacific Development

12 credit points

Assoc. Prof. Connell, Dr Hirsch, Prof E Waddell

Offered: February. **Prerequisite:** GEOG 2101 or 2102 or 2201 or 2202. **Classes:** 3 lec & 9hr tut or prac or fieldwork/wk. **Assessment:** One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

Senior Social and Economic Geography stream

The unit of study builds on key human geographic principles from the sub-disciplines of environmental, economic, development, social, cultural and urban geography.

The unit of study contains three options. Two are taught sequentially within the semester. The third is a field school that is run over a five week period in January-February, that is prior to the commencement of the semester. The Field School is held alternately in Southeast Asia (typically Vietnam, Laos and Thailand) and in the Island Pacific (typically Fiji, Vanuatu and New Caledonia). It is run in close association with university staff and students in the host countries and it focusses on environmental and developmental issues in the context of rapid rural and urban change.

GEOG 3202 Sustainable Cities & Regional Change

12 credit points

Dr P. McManus.

Offered: February. **Prerequisite:** GEOG 2102 or 2201 or 2202. **Classes:** 3 lec & 9 hrs tut or prac or fieldwork or indiv. research/wk. **Assessment:** One 2hr exam, two 2000w essays, tut papers, prac and fieldwork report/s.

Senior Social and Economic Geography stream: This unit of study develops the urban geography and environmental management ideas introduced in second year subjects. The focus is on the reconceptualisation of both cities and regions in order to physically change these spaces. The unit of study draws upon Australian and international examples and traces changes in ideas and physical form over time. Students completing this unit of study will have a sound understanding of urban environmental issues, current debates in urban and regional planning for sustainability and how to use GIS in urban and regional studies. Topics covered include ecological footprint analysis, transport, urban form, environmental history, government policy on cities and regions and the use of GIS in urban and regional studies.

GEOG 3302 Mining and Society

12 credit points

Assoc Prof Connell, Dr W Pritchard.

Offered: July. **Prerequisite:** GEOG (2001 or 2002 or 2102 or 2201 or 2202 or 3101) or GEOL (2002 or 2005). **Classes:** 4 lec & 4 prac/wk. One 5 day field excursion. **Assessment:** One 3hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

Senior Social and Economic Geography stream. This unit of study will provide an overview of key issues relating to the assessment of the social and economic impacts of mining and resource industries. Topics to be covered include: the economic geography of the global resources industry; Indigenous Land Rights and Native Title; regional economic analysis using input-output tables; social research on 'company town' mining environments and in fly-in fly-out mining systems, and the political geographies of contested resource ownership. The unit will be taught on the basis of two lecture/seminar presentations

weekly, plus problem-solving practical classes where students will be required to critically evaluate Impact Assessment documents relating to major mining developments. The lecture/seminar presentations will each have a two hour duration and will combine formal lecture-style teaching techniques with collaborative 'roundtable' seminar discussions.

Geography Honours

Students contemplating Geography Honours will be invited to complete a preliminary registration form in the July Semester. Following the publication of the July semester Senior Geography unit of study results, those eligible students who have preregistered will be invited to formally enrol. They are required to consult the Head of Geography as soon as possible after the publication of the results concerning choice of topic and the appointment of a staff supervisor. Preliminary work should begin shortly after the publication of these results.

Honours students are required to undertake formal coursework during their first semester and to participate in seminars throughout the year as arranged. They will be required to study original problems, working as appropriate in the field, the laboratory, libraries, and in some instances in conjunction with other university or government departments. A dissertation of not more than 20 000 words must be submitted during the second semester, followed by an examination that may include both written and oral work.

Geology and Geophysics

Location

Geology and Geophysics are housed in the Edgeworth David Building, immediately south of Fisher Library on Eastern Avenue. First year lectures and laboratories are held in the Carslaw Building.

Structure of Units of Study

Entry into Junior units of study in Geology does not require any prior knowledge of the subject. The Junior units of study provide an introduction to the earth sciences. The Intermediate and Senior Geology units of study build on the preceding coursework to present a balanced and wide ranging coverage of the subject area. A degree of specialisation is built into the Senior units of study as they are designed especially for students majoring in geology and proposing to pursue a career in that profession.

Geophysics is a component of most of the units of study in Geology but it is also offered as autonomous Senior units of study.

Suitably qualified students may proceed to Honours units of study in either Geology or Geophysics.

Geology Junior units of study

Students considering enrolling in these units of study should read the pamphlet entitled 'Junior Units of Study in Geology', which can be obtained from the Enquiry Office in the Edgeworth David Building. It gives details of content, text and reference books, staffing and other relevant matters.

All Junior Geology students are required to register in the first laboratory session of each semester.

GEOL 1001 Earth and its Environment

6 credit points

Prof P Davies

Offered: February. **Assumed knowledge:** No previous knowledge of Geology assumed. **Classes:** 3 lec & prac or tut/wk. **Assessment:** One 2hr exam, class and field work.

The aim of this unit of study is to provide students with an understanding of how the Earth system works, its origin, plate tectonics, surface processes, evolution of life and geologic time. The crises in resources and fossil fuel and implications for our economy will be discussed and an assessment made of our own impact on the Earth together with the role of geologists in protecting and monitoring the environment. Students will learn techniques and types of observations used to decipher the history and evolution of the Earth, and dating sediments and rocks. Laboratory classes and a one day field trip in the Sydney region will involve exercises in observing and describing Earth materi-

als and in interpreting Earth history from geological information, including fossils and maps.

GEOL1002 Earth Processes and Resources

6 credit points

Associate Professor Keene

Offered: July. **Assumed knowledge:** No previous knowledge of Geology assumed. **Classes:** 3 lec & prac ortut/wk. **Assessment:** One 2hr exam, class and field work.

The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of ore deposits will lead to an understanding of the driving forces in geology. Processes such as weathering, erosion and nature of sedimentary environments are related to the origin of the Australian landscape. In addition to laboratory classes there is a weekend field excursion to the Hunter Valley. Students will be required to pay hostel accommodation for one night on the Hunter Valley excursion.

Geology Intermediate Units of Study

GEOL 2001 Plate Tectonics and Materials

8 credit points

Dr D Wyman.

Offered: February. **Prerequisite:** GEOL 1002 or ENV11001. A candidate who has completed 24 credit points of Junior units of study in Physics and Chemistry and who has not taken Junior Geology or ENV11001, may apply under section 1 (4) for permission to enrol in GEOL 2001. **Classes:** 4 lec & 2 prac or tut/wk. **Assessment:** Two 2hr theory, lab exam, class work, field work. This unit of study introduces students to new practical techniques that provide a heightened understanding of the concepts introduced in the Junior units of study in Geology. The unit of study will examine the geodynamic processes that control global plate tectonics, the analysis and interpretation of geological structures and the fundamental processes responsible for the origin and evolution of the main types of igneous and sedimentary rocks. Through the analysis of hand specimens and a theoretical practical introduction to the use of the polarising microscope, the unit will also provide an introduction to the methods of optical crystallography, optical mineralogy and mineral identification in common rocks. In addition to laboratory classes there will be a compulsory five day field trip to near Yass, where students will be instructed in methods of geological mapping and the identification of geological objects in the field. Students will be required to pay hostel accommodation for five nights.

GEOL 2002 Resource Exploration

4 credit points

Dr Birch

Offered: July. **Prerequisite:** GEOL 2001. **Classes:** 2 lec & 1 prac or tut/wk. **Assessment:** One 2hr exam, class work.

Materials sourced from mining and fossil fuels are important to the Australian economy and essential parts of our everyday lives. Geological concepts developed in Geology 2001 are used as a basis to understand the basic physical, chemical and biological processes that formed metamorphic rocks, petroleum, coal and ore deposits in Australia. The unit of study also introduces students to geophysics and geophysical techniques used in resource exploration.

GEOL 2003 Fossils and Time

4 credit points

Dr Buick

Offered: July. **Prerequisite:** 24 credit points of Science units of study. **Classes:** 2 lec & 1 prac or tut/wk. **Assessment:** One 2hr theory, class work.

This palaeontology and stratigraphy unit of study is aimed at geoscientists, archaeologists, biologists, marine and environmental scientists who use fossils or stratigraphic data to determine ages, environments or evolutionary lineages. It provides an overview of fossil biodiversity, concentrating on invertebrate animals but also covering vertebrates, plants and microorganisms, with the emphasis on those groups that are most environmentally or stratigraphically useful. It also considers the main

methods of stratigraphic correlation and age determination, concentrating on litho- and bio-stratigraphy but also covering the more modern techniques of chemo-, magneto- and sequence-stratigraphy as well as radiometric age dating.

GEOL 2004 Environmental Geology: Hazards

4 credit points

Dr Hughes

Offered: February. **Prerequisite:** 24 credit points of Science units of study. See prerequisites for Senior Geology. **Classes:** 3 lec/wk & fieldwork. **Assessment:** One 2hr exam, one field report.

The Earth sciences provide the essential framework for understanding many of the natural and anthropogenic hazards that exist in the human environment. Principles of effective waste (including radioactive) management are presented as a means of mitigating pollution hazard. The unit of study also examines a range of natural hazards that can impact on society, either at a nuisance level (slope erosion, land subsidence) or as a disaster (earthquakes, volcanic eruptions, meteor impact). The unit of study finishes with a number of case studies looking at the geological hazards faced by people living in some of the world's major cities.

GEOL 2005 Environmental Geology: Resources

4 credit points

Dr Birch

Offered: July. **Prerequisite:** 24 credit points of Science units of study. See prerequisites for Senior Geology. **Classes:** 3 lec/wk & fieldwork. **Assessment:** One 2hr exam.

Australia is a major primary producing nation and mining accounts for a substantial part of its export income. This segment of the environmental geology program is concerned with the application of geological information and techniques in solving conflicts that may arise when new mines are proposed. It shows how geological principles can be used to minimise environmental degradation in areas of active mining. Topics covered include renewable and non-renewable global energy resources, the importance of minerals in an industrialised society, mineral extraction and processing, the environmental impact of mining and mineral processing, site reclamation, recycling, ecologically sustainable development, global climate change and environmental law.

Geology Senior units of study

Geology & Geophysics offers six units of study in five streams focussed on the vocational training needs of graduates seeking employment in Mineral Exploration as geologists or geophysicists, in Petroleum Exploration as geologists or geophysicists, and in Marine Geology. The streams and their recommended minimum units of study are:

Mineral Exploration-geology: GEOL 3101, GEOL 3102 and GEOL 3103

Mineral Exploration-geophysics: GEOP 3201, GEOP 3202 and GEOL 3101

Petroleum Exploration-geology: GEOL 3101, 3102 and GEOP 3201

Petroleum Exploration-geophysics: GEOP 3201, GEOP 3202 and GEOL 3102

Marine geology and geophysics: GEOL 3102, GEOL 3104 and GEOP 3201

Students that desire a general background in Geology and Geophysics for a career in government, education, resources law, commodity economics and management, or environmental earth science can construct their own stream consisting of any grouping of units of study. Each unit of study consists of three lectures and the equivalent of nine hours assigned work per week, which may comprise practical classes, seminars, individual course work and/or field work. Some units of study have compulsory field excursions, which are commonly held in semester breaks.

To complete Senior Geology & Geophysics, a student must complete a minimum of two units of study in either Geology or Geophysics (24 credit points). A student would normally select at least two sequential units of study from the five streams, however, students may vary the sequence of units of