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UNIVERSITY OF
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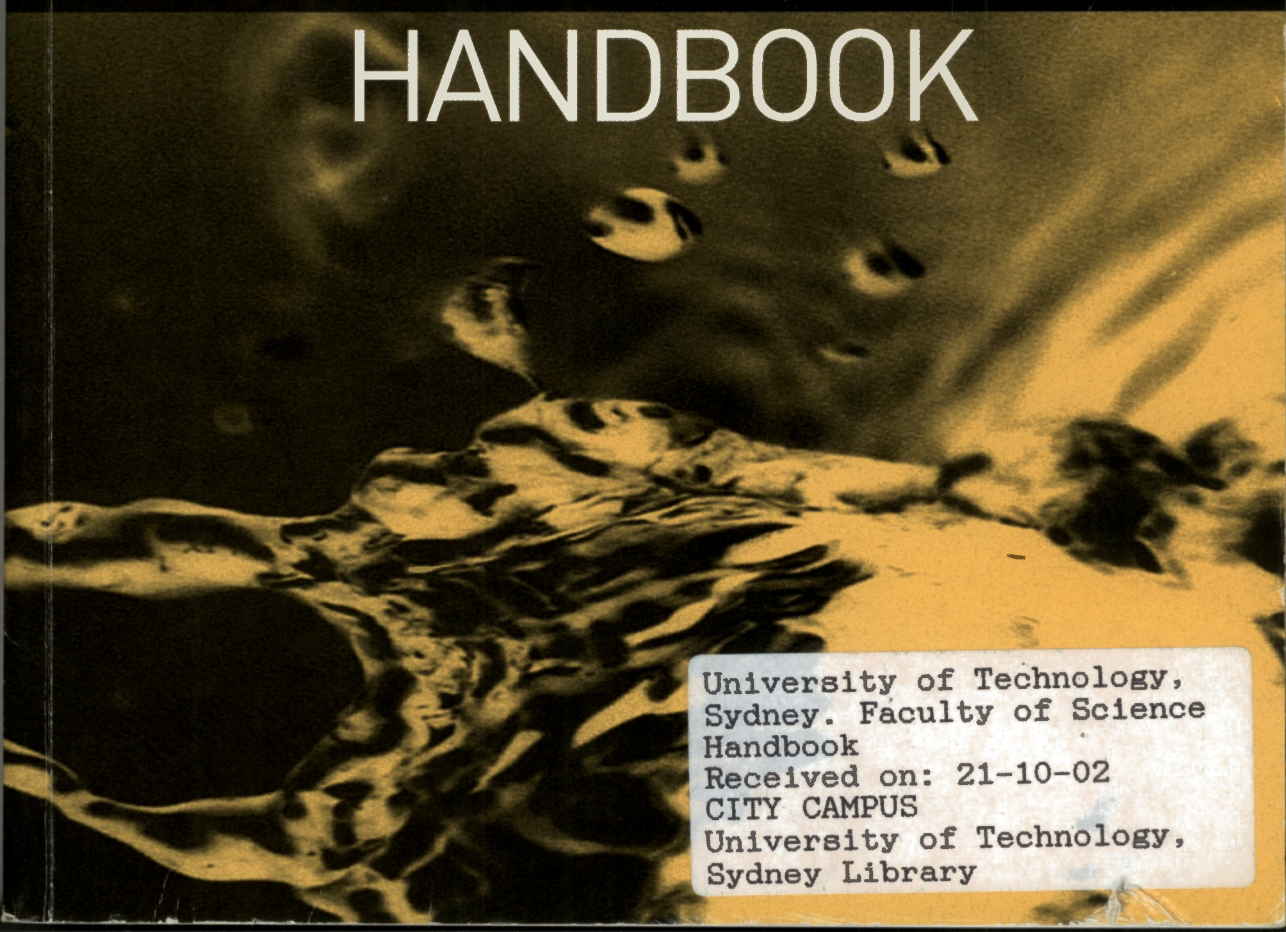
2003

UTS:SCIENCE

HANDBOOK



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Sydney. Faculty of Science
Handbook
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UNIVERSITY OF TECHNOLOGY SYDNEY

UTS:SCIENCE HANDBOOK 2003

DISCLAIMER

This publication contains information which is current at 6 September 2002. Changes in circumstances after this date may impact upon the accuracy or currency of the information. The University takes all due care to ensure that the information contained here is accurate, but reserves the right to vary any information described in this publication without notice. More up-to-date information is published online at:

www.uts.edu.au/div/publications

Readers are responsible for verifying information which pertains to them by contacting the Faculty or the UTS Student Info & Admin Centre.

EQUAL OPPORTUNITY

It is the policy of UTS to provide equal opportunity for all persons regardless of race; colour; descent; national or ethnic origin; ethno-religious background; sex; marital status; pregnancy; potential pregnancy; carer's responsibilities; disability; age; homosexuality; transgender status; political conviction; and religious belief.

FREE SPEECH

UTS supports the right to freedom of speech and the rights of its members to contribute to the diversity of views presented in our society.

NON-DISCRIMINATORY LANGUAGE

UTS has adopted the use of non-discriminatory language as a key strategy in providing equal opportunity for all staff and students. Guidelines for the use of non-discriminatory language have been developed and all members of the University community are encouraged to use them.

www.equity.uts.edu.au/resources/language.html

ACCESS UTS ON THE WEB

www.uts.edu.au

Faculty Handbooks and UTS: Calendar
www.uts.edu.au/div/publications/

UTS Rules, Policies and Procedures
www.uts.edu.au/div/publications/policies/

EDITORIAL AND PRODUCTION

Publications
Corporate Affairs Unit
Registrar's Division

COVER

Design by Emery Vincent Design
Production by UTS External Relations Unit

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GENERAL INFORMATION

WELCOME

Welcome to the University of Technology, Sydney (UTS), one of the largest universities in New South Wales – a university with an international reputation for quality programs and flexible learning. UTS develops and regularly revises its programs of study in partnership with industry, government and professional bodies, so that its degrees are based on the latest professional standards and current practices. As a result, UTS produces graduates who are ready for work, and this is demonstrated in the high numbers of its students who are members of the workforce within a few months of finishing their degree.

UTS offers its students a lively, supportive and diverse learning environment across three campuses, and a range of social, cultural and sporting facilities to enrich each student's experience. UTS regards learning as a lifelong experience, and offers a range of programs to cater for the educational needs of people at a variety of stages in their lives, and from diverse backgrounds and cultures.

UTS offers undergraduate and postgraduate degrees, developed by the Faculties of Business; Design, Architecture and Building; Education; Engineering; Humanities and Social Sciences; Information Technology; Law; Nursing, Midwifery and Health; and Science. Each of these faculties is responsible for programs across a number of key disciplines, and many offer courses in conjunction with one another, or with the Institute for International Studies. Courses developed and delivered by these faculties reflect the University's commitment to providing a relevant education to students through flexible and work-based modes of learning and through the ongoing internationalisation of the curriculum.

ABOUT THE UTS HANDBOOKS

Every year UTS produces 10 faculty/institute handbooks which provide the latest information on approved courses and subjects to be offered in the following year. These handbooks include comprehensive details about course content and structure, subject and elective choices, attendance patterns, credit-point requirements, and important faculty and student information. Many of them also contain faculty policies and guidelines for participation in specific courses. This provides students with the necessary information to meet the requirements of the course, complete a program of study, and receive a degree.

UTS also produces a companion volume to these handbooks every year. The *UTS: Calendar* contains the University Act, By-law and Rules, a list of courses offered across the University, and other useful University information. Copies of the faculty/institute handbooks and the *UTS: Calendar* are held in the University's libraries and faculty offices and can be purchased at the Co-op Bookshop.

Every effort is made to ensure that the information contained in the handbooks and the Calendar is correct at the time of printing. However, UTS is continuously updating and reviewing courses and services to ensure that they meet needs, both current and emerging, and as a result the information contained in these publications may be subject to change.

For the latest information, see the University's website at:

www.uts.edu.au

STUDENT INQUIRIES

UTS Student Info & Admin Centre

telephone (02) 9514 1222
email info.office@uts.edu.au
www.uts.edu.au

City campus

CB01.4
(Level 4 foyer, Tower Building)
15 Broadway, Ultimo

Kuring-gai campus

KG01.6 (Level 6, Building K1)
Eton Road, Lindfield

Postal address

PO Box 123, Broadway NSW 2007

International Programs Office

CB01.3A
(Level 3A, Tower Building)
telephone +61 2 9514 1531
fax +61 2 9514 1530
email intlprograms@uts.edu.au
www.ipo.uts.edu.au
CRICOS provider code: 00099F

Faculty student offices

Business

Undergraduate inquiries

CM05C.1
(Level 1, Building 5)
City campus at Haymarket
telephone (02) 9514 3500

KG01.5
(Level 5, Building K1)
Kuring-gai campus
telephone (02) 9514 5355
email undergraduate.business@uts.edu.au

Postgraduate inquiries

CM05B.5
(Level 5, Building 5)
City campus at Haymarket
telephone (02) 9514 3660
email graduate.business@uts.edu.au

Design, Architecture and Building

CB06.5
(Level 5, Building 6
(Peter Johnson Building))
City campus
telephone (02) 9514 8913
email dab.info@uts.edu.au

Education

CB10.05.430
235 Jones Street
City campus
telephone (02) 9514 3900
email education@uts.edu.au

KG02.3.33
(Room 333, Building K2)
Kuring-gai campus
telephone (02) 9514 5621
email teached.office@uts.edu.au

Engineering

CB02.7
(Level 7, Building 2)
City campus
telephone (02) 9514 2666
email upo@eng.uts.edu.au
www.eng.uts.edu.au

Humanities and Social Sciences

Faculty Student Centre

CB03.2
(Level 2, Building 3 (Bon Marche))
City campus
telephone (02) 9514 2300
email hss.studentcentre@uts.edu.au

Faculty Research Office

CB02.7
(Level 7, Building 2)
City campus
telephone (02) 9514 1959
email research.degrees.hss@uts.edu.au

Information Technology

CB10.3.510
(Level 3, Building 10)
City campus
telephone (02) 9514 1803
email info@it.uts.edu.au
http://it.uts.edu.au

Law

CM05B.3.03
(Room B303, Building 5)
City campus at Haymarket
telephone (02) 9514 3444
email admingen@law.uts.edu.au

Nursing, Midwifery and Health

KG05.3.97
(Room 397, Level 3, Building K5)
Kuring-gai campus
telephone (02) 9514 5201 or (02) 9514 5202
email nmh@uts.edu.au

Science

CB04.3.07
(Level 3, Building 4)
City campus

SL01.2.01
(Level 2, Dunbar Building)
St Leonards campus

telephone (02) 9514 1756
email information@science.uts.edu.au

Institute for International Studies

10 Quay Street
Haymarket, City campus
telephone (02) 9514 1574
email iisinfo@uts.edu.au

Note: The Building ID system is a four-character code, comprising two letters describing a geographic location and two numerals that use existing building numbers. Office locations appear as BuildingID.FloorNo.RoomNo.

The geographic location codes are:

CB	City campus, Broadway
CC	City campus, Blackfriars, Chippendale
CM	City campus at Haymarket
KG	Kuring-gai campus
SL	St Leonards campus

APPLICATIONS AND ENROLMENT

Undergraduate

The NSW and ACT Universities Admissions Centre (UAC) processes most applications for undergraduate courses which start at the beginning of the year. Students are required to lodge these UAC application forms between August and December; early closing dates may apply to some courses. To find out more about these courses and the application procedures, check the *UAC Guide*, or the UAC website at:

www.uac.edu.au

Students can also apply for entry to some UTS courses by lodging a UTS application form directly with the University. These are usually courses that are not available to recent school leavers and do not have a UAC code.

Postgraduate

Applications for postgraduate courses should be made directly to UTS. For courses starting at the beginning of the year, most applications open in August with a first round closing date of 31 October. For courses starting in the middle of the year, applications open in May.

For further information, contact the UTS Student Info & Admin Centre.

International students

International student applications for both postgraduate and undergraduate courses can be made either directly to the International Programs Office or through one of the University's registered agents. For courses starting at the beginning of the year, applications should be received by 30 November of the previous year. For courses starting in the middle of the year, applications should be received by 31 May of that year. For more information, contact:

email intlprograms@uts.edu.au

CRICOS provider code: 00099F

Non-award and cross-institutional study

Students who want to study a single subject at UTS which is not part of a UTS degree or qualification, must apply for non-award or cross-institutional study. There are three application periods, and closing dates vary for each semester. For more information contact the appropriate faculty or the UTS Student Info & Admin Centre.

Enrolment

Students should be aware that it is their responsibility to ensure:

- that their personal details are correct and the University informed of any changes as they occur
- that their enrolment details are correct and that their subject choices can be credited toward the award in which enrolled.

ASSESSMENT

Students come to university for a variety of reasons including to gain a specific qualification, to pursue their interest in a particular field and to broaden their education. Good academic practice demands personal integrity and respect for scholarship. For example, academic staff are responsible for marking assessment fairly and consistently, and students are responsible for submitting work that represents their own efforts to meet the stated requirements.

Student learning is more effective and enjoyable if basic principles of good academic practice are followed. These include the following:

- academic integrity
- self-motivation and commitment to learning
- awareness of requirements
- participation
- respecting the rights of others, and
- seeking timely help from appropriate sources.

Each subject outline contains information on assessment and students should refer to it for specific details.

ENVIRONMENT, HEALTH, SAFETY AND SECURITY

The University is committed to providing a safe and healthy workplace for students, staff and visitors and adopting a socially responsible approach towards protecting and sustaining the environment. Staff and students must take reasonable care of themselves and others, cooperate with actions taken to protect health and safety and not wilfully place at risk the health, safety or wellbeing of others.

Emergency procedures

Report emergencies to Security by dialling '6' from any internal telephone or Freecall 1800 249 559 (24 hrs).

Let the Security Officer know:

- the nature of the problem (e.g. fire, medical emergency, assault)
- the location of the emergency, and
- your name and the telephone extension you are calling from.

Evacuation procedures

The Evacuation Alarm consists of two tones:

BEEP...BEEP...BEEP... (Prepare)

When you hear this tone:

- shut down or secure machinery and computers
- prepare to evacuate, and
- check whether anyone needs assistance.

WHOOP...WHOOP...WHOOP... (Evacuate)

When you hear this tone:

- listen for instructions, a public announcement will tell you to 'Evacuate the building'
- leave the building via the nearest fire exit
- do not use lifts
- provide assistance where required
- proceed to the assembly area
- follow instructions from Emergency Authorities and Security, and
- do not return to the building until the all clear is given.

Hazards and risks

If you see a hazard or condition that presents a risk to your health and safety, report it to a staff member or Security Officer so that something can be done to remedy it. Help to fix it if you can.

To report a serious hazard after hours, contact Security by dialling '6' from any internal telephone or Freecall 1800 249 559 (24 hrs).

Safe work practices

Always follow safe work practices as provided by your lecturer or a technical staff member. Ask for help if you are unsure about how to use a piece of equipment or undertake a task, particularly before carrying out new or unfamiliar work.

First aid

There are a number of First Aid Officers in every building on each UTS campus. See the first aid poster in your study area for their names, location and phone number. Security Officers also have first aid training and can be contacted by dialling '6' from any internal telephone or Freecall 1800 249 559 (24 hrs).

Medical attention is also available from the Health Service at City (Broadway) and Kuring-gai campuses.

Accident/incident reporting

If you are involved in an accident or incident, report it to a staff member or Security Officer and then complete a UTS Accident/Incident Report form, available from your faculty office or Security.

If the accident/incident is serious, call Security immediately by dialling '6' from any internal telephone or Freecall 1 800 249 559 (24 hrs).

Smoking

Smoking is not permitted inside any building on any campus of the University, or in any University vehicle.

Campus shuttle bus

The University operates a number of shuttle bus services. These run between:

- City and Kuring-gai campus
- Kuring-gai campus main entry and the Kuring-gai campus carpark
- City campus at Haymarket and Broadway and the student accommodation facilities (Geegal and Bulga Ngurra). This shuttle covers the area bounded by William Henry Street, Bay Street and Broadway. All students living within this area are urged to use the service to ensure a safe passage home.

Shuttle bus timetables are available from the Security Office on your campus.

Lost and found

The Security Office on your Campus is the first point of call to check for lost property or to hand in found items. Items are kept for three months and if unclaimed become the property of the person who found the item.

Security systems

All buildings are accessible by a personal identification number (PIN) and are protected by an electronic intrusion detection system and a closed circuit TV network. You can obtain a PIN from your faculty office. Remember, your PIN is assigned to you and is not transferable. Do not misuse your PIN as this could compromise the safety of others.

Keeping yourself safe

- If studying/working in an isolated area, particularly after hours, lock the doors and don't let anyone in who you don't know. Do not leave doors propped open.
- If you think you are being followed or feel frightened for any reason, contact Security by dialling '6' from any internal telephone or Freecall 1 800 249 559.
- Do not take shortcuts through isolated areas, particularly at the St Leonards campus where the cemetery is a definite no-go area, even during the day. Keep to well-travelled routes and well-lit areas.
- Walk near the curb, away from doorways and bushes.

- Be alert when using toilet facilities, particularly in isolated areas. Check for strangers while you are still near the door. Whenever possible, ask a friend to accompany you.
- If you plan to have a drink after classes, make plans ahead of time for getting home. Don't leave with people you are not comfortable with.
- Do not hitchhike or accept a lift from a stranger.
- If you feel uncomfortable about who is in a lift/elevator, do not get in. Wait until the next lift/elevator arrives.
- Remember, UTS Security staff are available 24 hours a day, 7 days a week.

Keeping your belongings safe

The University consists of a number of large public buildings in the CBD and experiences a level of property crime in keeping with its location. Purses, wallets and particularly mobile phones are a prime target for thieves.

- Mark your name or other personal identification (e.g. your driver's licence number) on personal items of value. Marked items are less likely to be stolen.
- Use the lockers in the Library to store personal property, particularly if you plan on spending some time studying.
- Keep your possessions with you at all times. Do not leave wallets, purses or phones unprotected or out of your sight, particularly in the Library, computer laboratories or cafeterias.
- Do not carry large amounts of money – there are automatic teller machines (ATMs) on most campuses.

Bicycle storage

Bicycle racks are located outside major buildings and often covered by a security camera.

Recycling

UTS has facilities for recycling paper, glass, cardboard and aluminium. Reduce, reuse and recycle.

Contacts

Environment, Health and Safety
telephone (02) 9514 1326, (02) 9514 1062, (02) 9514 1063
email ehs.branch@uts.edu.au
www.ehs.uts.edu.au

Security

City campus at Broadway
telephone (02) 9514 1192
email security.general@uts.edu.au

City campus at Haymarket
telephone (02) 9514 3399
email security.haymarket@uts.edu.au

Kuring-gai campus
telephone (02) 9514 5551
email security.kuring-gai@uts.edu.au

St Leonards campus, Dunbar Building
telephone (02) 9514 4004
email security.dunbar@uts.edu.au

EQUITY AND DIVERSITY

UTS has a strong commitment to ensure that the diverse nature of the Australian society is reflected in all aspects of its employment and education. The University also aims to assist members of under-represented groups overcome past or present discrimination, and to provide a supportive and open organisational culture in which students and staff are able to develop to their full potential.

UTS is committed to implementing its Equal Opportunity Statement which aims to ensure that all students and staff are treated fairly and equitably, and can work and study in an environment free of harassment. Discrimination, harassment and victimisation are unlawful, undermine professional relationships, diminish the experience of university life, and are not tolerated at UTS. All students and staff have a responsibility to contribute to the achievement of a productive, safe and equitable study and work environment.

The Equity & Diversity Unit provides a range of services for students and prospective students. These include the coordination of the inpUTS Educational Access Scheme for students who have experienced long-term educational disadvantage; coordination of financial scholarships and awards for commencing low-income students; and the provision of confidential advice and assistance with the resolution of discrimination and harassment-related grievances.

Equity & Diversity Unit
CB01.17
telephone (02) 9514 1084
email equity.diversity.unit@uts.edu.au

www.equity.uts.edu.au

INTERNATIONAL EXCHANGE STUDENT SCHEME

UTS encourages its students to develop an international perspective on their courses and careers. As part of their studies, students have the opportunity to spend one or two semesters studying at an overseas partner university and receive credit towards their UTS degrees. To enable this to happen UTS has formal links with a large number of universities around the world. UTS is expanding its partnerships with universities – particularly where students can learn in English – so that more students can experience an exchange program. Some of these exchange opportunities will be in countries where English is not the first language but where university-level teaching in English is available. These countries include Austria, Denmark, Finland, France, Malaysia, the Netherlands and Sweden.

Scholarships available

UTS supports student participation in the International Exchange Students Scheme through the provision of a number of $1,000 scholarships each semester as a contribution to the costs of going on exchange. While on exchange, students do not pay tuition fees in the overseas university. They pay their usual HECS fees or, if they are international students at UTS, their Australian tuition fees.

Further information and application forms for the Exchange Scheme and scholarships can be obtained from:

International Exchange Students Scheme
Institute for International Studies
10 Quay Street
Haymarket, 2007
telephone +61 2 9514 1537
email international.exchange@uts.edu.au

www.iis.uts.edu.au/iexchange/

NSW CHILD PROTECTION LEGISLATION

Prohibited Person Declaration and Screening

In accordance with New South Wales Child Protection legislation, students participating in practical training placements which require them to have direct contact with children under 18 in designated child-related employment areas are required to complete a Prohibited Employment Declaration form on enrolment. In some circumstances students may also be subject to employment screening. Screening is carried out only with students' consent but eligibility for participation in such programs is determined on the basis of information obtained through these checks.

FEES AND COSTS

Service fees

Service fees are charged to students to contribute to the cost of a range of facilities and services which are generally available to all students during the course of their study.

Variations and exemptions

Fees and charges may vary from time to time. For current information refer to the UTS Fees and Charges website at:

www.sau.uts.edu.au/fees

In certain circumstances, some students may be eligible for reduced service fees. For full details of variations and exemptions, contact the UTS Student Info & Admin Centre.

Course fees

No course fees are paid by local students undertaking undergraduate studies at UTS. Students are, however, liable for HECS charges (see following). Many postgraduate courses attract a course fee. These course fees are calculated on a course-by-course basis and are charged in addition to the service fees outlined above. Payment of course fees may vary depending on a student's status, and on conditions laid down by the faculty. Contact the relevant faculty for full details.

Details of course fees are outlined under each course entry in this handbook. Readers should note that fees quoted throughout the handbook are correct at the time of publication however they are subject to change and should be confirmed with the Student Info & Admin Centre.

Course fees for international students

At the time of publication, course fees for undergraduate international students range from A$5,000 to A$8,500 per semester, and for postgraduate international students from A$5,000 to A$8,700 per semester. These may vary from time to time and the International Programs Office should be contacted for up-to-date information, or visit the website:

www.ipo.uts.edu.au/courses/index.html

International students in Australia on a student visa are required to undertake full-time study as a condition of their visa.

For more information contact the International Programs Office, or visit the website:

www.ipo.uts.edu.au

Other costs

Students may incur other costs while they study at UTS. These may include books, printed sets of reading materials, photocopying, equipment hire, the purchase of computer software and hardware, and Internet services.

Some elective subjects may incur an additional cost where travel away from the University is involved.

HECS

The Higher Education Contribution Scheme (HECS) is a financial contribution paid to the Commonwealth Government by tertiary students towards the cost of their education. It is payable each teaching period and the amount paid varies according to the number of credit points undertaken and the method of payment nominated by the student.

Most students have three choices in the way they pay HECS:

1. paying all of the HECS up front and receiving a 25% discount
2. deferring all payment until a student's income reaches a certain level, or
3. paying at least $500 of the HECS contribution up front and deferring the remainder.

Note: These options may not apply to New Zealand citizens and Australian Permanent Residents.

Commonwealth legislation sets strict conditions for HECS over which the University has no control. HECS charges are based on the subjects in which students are enrolled on the HECS census date. It is important for students to realise that any reductions in their academic workload after the census date for a particular semester will not reduce their HECS liability.

Students who defer their HECS payments become liable to commence repayment once their taxable income reaches the repayment threshold. This does not necessarily mean at the conclusion of their studies – a student's income may reach this threshold before then.

New students, students returning from leave and students who are commencing a new or second course, must complete a Payment Options Declaration form. This form must be lodged with the University by the census date and should show a valid Tax File Number.

The HECS census date for Autumn semester is 31 March and for Spring semester is 31 August. HECS census dates for other teaching periods can be obtained from the UTS Student Info & Admin Centre.

There are a number of variations to these guidelines. It is the responsibility of each student to find out which HECS conditions apply to them. Information can be obtained from the booklet *HECS Your Questions Answered*, which is available from the Department of Education, Science and Training (DEST) on telephone 1800 020 108 or from the website at:

www.hecs.gov.au

This website also indicates the full-time, full-year contributions for each band in differential HECS and the circumstances in which a flat rate may apply.

POSTGRADUATE EDUCATION LOANS SCHEME (PELS)

PELS is an income-contingent loan facility similar to the Higher Education Contribution Scheme (HECS) for eligible students enrolled in fee-paying postgraduate non-research courses.

All eligible students enrolled in a postgraduate fee-paying non-research course in 2003 are eligible to apply for a loan. This means that both continuing and commencing students are eligible to apply.

Eligible students are able to borrow up to the amount of the tuition fee being charged by UTS for each semester for the duration of their course. Students are also able to pay part of their semester tuition fee to UTS for a course and obtain a PELS loan for the balance of their outstanding fees for each semester.

Students are required to complete a Loan Request form by the census date each semester requesting the Commonwealth to pay their tuition fees to UTS and declare that they are aware of their obligations to repay the loan under the scheme when their income reaches a certain amount. Students also have to provide a Tax File Number (TFN) to UTS in the same way that students choosing to defer their HECS payment already do.

Queries in relation to PELS should be directed to the Student Info & Admin Centre on telephone (02) 9514 1222, or further information can be obtained from the DEST website at:

www.hecs.gov.au/pels.htm

BRIDGING FOR OVERSEAS-TRAINED PROFESSIONALS LOAN SCHEME (BOTPLS)

BOTPLS is an interest-free loan facility for overseas-trained professionals who are seeking to work in regulated or self-regulated professions in Australia. It is similar to the deferred payment arrangements available under HECS or PELS (see above). Eligible overseas-trained professionals who are citizens or permanent residents of Australia wishing to meet formal recognition requirements for their profession in Australia are able to access these loans.

More information can be obtained from the booklet *BOTPLS Your Questions Answered,* which is available from the Department of Education, Science and Training on telephone 1800 020 108 or from the website at:

www.hecs.gov.au/botpls.htm

FINANCIAL HELP

Austudy / Youth Allowance

Students aged under 25 years may be eligible to receive financial assistance in the form of the Youth Allowance.

Full-time students aged over 25 years may be eligible to receive Austudy which provides financial help to students who meet its income and assets requirements.

Application forms and information about eligibility for both Youth Allowance and Austudy are available from the Student Services Unit at Kuring-gai or City campuses.

Commonwealth legislation sets strict requirements for Austudy/Youth Allowance over which the University has no control. It is important that the students concerned understand these requirements.

Students who receive Austudy or the Youth Allowance and decide to drop subjects during the semester must be aware that to remain eligible they must be enrolled in a minimum of 18 credit points, or have a HECS liability for the semester of .375 equivalent full-time student units. The only exceptions made are for some students with disabilities which interfere with their studies, students who are single supporting parents or, in exceptional cases, those who have been directed by the University to reduce their study load.

For more information, talk to a Financial Assistance Officer in the Student Services Unit. Call for an appointment on:

telephone (02) 9514 1177 (City campus)
or (02) 9514 5342 (Kuring-gai campus)

Application forms for both Austudy and Youth Allowance should be lodged as soon as possible with any Centrelink office.

Abstudy

Abstudy assists Aboriginal and Torres Strait Islander tertiary students by providing income support and other assistance. For more information about Abstudy, contact the staff at Jumbunna, Indigenous House of Learning:

CB01.17
telephone (02) 9514 1902 or 1800 064 312

SUPPORT FOR STUDENT LEARNING

Student Services Unit

To ensure student success, the University provides a range of professional services to support different aspects of student life and learning at UTS.

These services include:

- orientation and University transition programs
- student housing and assistance in finding private rental accommodation
- workshops and individual counselling to enhance effective learning
- assistance for students with disabilities and other special needs
- student loans and financial assistance
- health services
- personal counselling
- assistance with administrative problems or complaints
- assistance when extenuating circumstances impact on study
- help with getting a job, and
- campus interview program.

All these services are sensitive to the needs of students from diverse backgrounds and are available at City and Kuring-gai campuses with flexible hours for part-timers.

The Student Services Unit website offers a jobs database, 'where UTS graduates get jobs', virtual counselling and links to the 'student help' website:

www.uts.edu.au/div/ssu

Transition to university programs

Orientation 2003

UTS offers a free Study Success Program of integrated lectures and activities before semester begins, to help new students manage the transition to university study. There are specially tailored programs for part-time and international students as well as for recent school leavers. Students are informed of academic expectations, the skills needed to be an independent learner, and learning strategies which can help them successfully manage the workload. They are also provided with valuable information about how the University and its faculties operate, and the services provided.

Peer support network

The Peer Network Program enlists the aid of existing students to assist with the orientation of new students.

For more information, contact:

Student Services Unit
telephone (02) 9514 1177 (City campus) or
(02) 9514 5342 (Kuring-gai campus)

Careers Service

The Careers Service can help students make the link between various UTS courses and the careers they can lead to. The Careers Service also offers general career guidance, and assists with job placement for students seeking permanent or casual vacation work and employment. Contact the Careers Service on:

telephone (02) 9514 1471 (City campus)

www.uts.edu.au/div/cas

Chaplaincy

The Chaplaincy is coordinated through Student Services. Visiting Chaplains and Worship Rooms are available to students.

Chaplains represent different Christian denominations, as well as Buddhism, Judaism and Islam. Further information is available on:

telephone (02) 9514 1177 or (02) 9514 2523

Counselling

Counsellors are available at both the City and Kuring-gai campuses for individual consultation. Group programs are also held throughout the year. This service is free of charge, confidential and sensitive to diversity. For further information, contact:

telephone (02) 9514 1177 (City campus) or
(02) 9514 5342 (Kuring-gai campus)

Telephone counselling is available on:

telephone (02) 9514 1177.

Financial assistance

Financial assistance staff assist students with personal financial matters and are the contact point for student loans. They can also advise on Youth Allowance, Austudy and other Centrelink benefits. Contact them on:

telephone (02) 9514 1177

Health/Medical

The Health Service offers a bulk-billing GP practice to students at two locations. Experienced doctors with diverse personal backgrounds and clinical interests are available. For appointments, contact:

telephone (02) 9514 1177 (City campus) or
(02) 9514 5342 (Kuring-gai campus)

Housing

University Housing provides assistance to students in locating private accommodation. A limited amount of UTS-owned housing is also available. For further information, contact:

telephone (02) 9514 1509 (listings) or
(02) 9514 1199 (UTS Residences)

Special Needs Service

The University has in place a range of services and procedures to improve access for students with disabilities, ongoing illnesses and other special needs. Students who have disabilities or illnesses which may impact on their studies are encouraged to contact the Special Needs Service for a confidential discussion of the assistance available on:

telephone (02) 9514 1177
TTY (02) 9514 1164
email special.needs@uts.edu.au

Contacting Student Services

telephone (02) 9514 1177
TTY (02) 9414 1164
fax (02) 9514 1172
email student.services@uts.edu.au

www.uts.edu.au/div/ssu

City campus

CB01.6.01

- Counselling Service
- Health Service
- Special Needs and Financial Assistance Service

CB01.3.01

- Careers Service

CB01.3.08

- Housing Service

Kuring-gai campus

KG01.5.19 (Level 5, Building K1)

- Counselling Service
- Health Service
- Special Needs and Financial Assistance

Computing facilities at UTS

UTS General Access Computing Facilities are located throughout all campuses of the University and are available for all students and staff. Details of locations and availability of the computer laboratories can be obtained from the Information Technology Division (ITD) website at:

www.itd.uts.edu.au

or call the IT Support Centre on:

telephone (02) 9514 2222

Access to these labs requires a login and password. Students can call the IT Support Centre for assistance in setting up a login or pick up a *Computing Facilities @ UTS* brochure from any of the labs or IT Support Centres.

All University computing facilities are to be used exclusively for purposes concerning your study. Misuse, damage to property, security breaches, harassment or offensive behaviour will result in bans and disciplinary action. The Acceptable Use of IT Facilities Policy covers all UTS IT facilities including email accounts. For further information see the website:

www.itd.uts.edu.au

Student email accounts

UTS provides students with an email account, which gives all students access to email facilities via the web. To find out more about an email account, visit the website:

www.uts.edu.au/email/

Alternatively, students can pick up the brochure, Your UTS Email Account, available in all ITD General Access Labs and drop-in centres. If students have any problems with activating their account or the computing facilities in general, they should contact the IT Support Centre on:

telephone (02) 9514 2222

email itsupport@uts.edu.au

Computer training

In general, where computer training is necessary as part of a course that attracts HECS, it is provided as part of that course. Students can also consult the Computing Study Centre (see below).

STUDENT LEARNING CENTRES

Chemistry Learning Resources Centre

The Chemistry Learning Resources Centre assists students in undergraduate courses in the faculties of Science; Nursing, Midwifery and Health; Engineering; and Business.

CB04.2.11, City campus

Rosemary Ward
telephone (02) 9514 1729
email Rosemary.Ward@uts.edu.au

Computing Study Centre

The Computing Study Centre assists students in developing skills in the use of various standard computer packages.

CB01.16.11, City campus

John Colville, Director
telephone (02) 9514 1854
email John.Colville@uts.edu.au

www.it.uts.edu.au/activities/csc/

English Language Study Skills Assistance (ELSSA) Centre

ELSSA, the UTS Centre for academic language development, provides free custom-designed programs in academic writing, reading, speaking, critical thinking and cultural knowledge to meet the needs of undergraduate and postgraduate UTS students completing their degree in English. ELSSA also collaborates with staff in the faculties to foster interest in, and knowledge of, literacy and learning through research, intellectual contributions and staff development. ELSSA values quality, diversity, internationalisation and flexibility as it serves the wider academic and professional communities. The Centre also offers several award programs. For details, refer to pages 22–25.

Alex Barthel, Director
CB01.18.22, City campus
telephone (02) 9514 2327

or

KG02.5.22
Kuring-gai campus
telephone (02) 9514 5160
email elssa.centre@uts.edu.au

www.uts.edu.au/div/elssa/

Jumbunna, Indigenous House of Learning

Student Support Unit

Jumbunna's Student Support Unit provides a range of academic and cultural support to Aboriginal and Torres Strait Islander students studying at UTS to ensure equal access and participation in higher education.

The support available to students includes academic assistance, cultural activities, cultural affirmation programs, group and private study areas, student common room and kitchen, and a computer laboratory and printing facilities.

Jumbunna, Indigenous House of Learning
CB01.17
City campus

telephone (02) 9514 1902 or 1800 064 312
fax (02) 9514 1894

Mathematics Study Centre

The Centre coordinates mathematics assistance across the University and is staffed by lecturers with expertise in mathematics and statistics. The Centre runs bridging and preparation courses as well as providing support during study.

CB01.16
City campus

Leigh Wood, Director
telephone (02) 9514 2268
email Leigh.Wood@uts.edu.au

KG02.2.52
Kuring-gai campus
telephone (02) 9514 5186

www.science.uts.edu.au/maths/msc.html

Physics Learning Centre

This is a drop-in centre for first-year physics students.

CB01.11.14
City campus
(with an adjoining computer laboratory)

Peter Logan
telephone (02) 9514 2194
email Peter.Logan@uts.edu.au

www.science.uts.edu.au/physics/plc.html

OTHER SERVICES

Student Ombud

Enrolled or registered students with a complaint against decisions of University staff, or related to the University, may seek assistance from the Student Ombud.

All matters are treated in the strictest confidence and in accord with proper processes.

CB02.4.02
City campus
telephone (02) 9514 2575
email ombuds@uts.edu.au

www.uts.edu.au/oth/ombuds

Academic Liaison Officers

Each faculty has one or more Academic Liaison Officer (AOL) who is a member of the academic staff. AOLs can approve requests for adjustments to assessment arrangements for students with disabilities or ongoing illnesses. They are also contacts for students who experience difficulties because of carer responsibilities, inpUTS students and students who have English language difficulties. Contact the relevant faculty for more information or see online at:

www.uts.edu.au/div/ssu/alo.html

Freedom of Information and Privacy

Under the *Freedom of Information Act 1989* (NSW), individuals may apply for access to information held by the University.

Personal information may also be accessed under the *Privacy and Personal Information Act 1998*. In addition to the requirements of the Act, UTS has a number of policies which govern the collection and use of private information.

Dr J FitzGerald
Registrar
CB01.4.16
City campus
telephone (02) 9514 1322
email Jeff.FitzGerald@uts.edu.au

Student complaints

UTS is committed to providing a learning and working environment in which complaints are responded to promptly and with minimum distress and maximum protection to all parties.

All students and staff have a responsibility to contribute to the achievement of a productive, safe and equitable study and work environment at UTS. The University's procedures for handling student complaints are based on confidentiality, impartiality, procedural fairness, protection from victimisation and prompt resolution.

Students should first raise their complaint directly with the person concerned where possible, or with an appropriate person in the faculty or administrative unit concerned. To seek advice and assistance in lodging a complaint, contact the Student Services Unit or the Equity & Diversity Unit.

The Policy on Handling Student Complaints is published on the Rules, Policies and Procedures website at:

www.uts.edu.au/div/publications/policies

Information on how to make a complaint is available on the Equity & Diversity Unit's website at:

www.equity.uts.edu.au/resources/gota.html

UNIVERSITY GRADUATE SCHOOL

The University Graduate School provides a focus for higher degree research students in all graduate research courses at UTS. It takes the lead in developing policy for graduate research studies in partnership with the faculties. The University Graduate School also works to enhance the quality of graduate research programs by monitoring quality and supporting research degree students and their supervisors.

The University Graduate School is located at CB10.6, City campus.

telephone (02) 9514 1336
fax (02) 9514 1588
email ugs@uts.edu.au

www.gradschool.uts.edu.au

UTS LIBRARY

The University Library collections are housed in three campus libraries and contain over 650,000 books, journals and audiovisual materials as well as a large range of electronic citation and full-text databases.

Services for students include face-to-face assistance in finding information through service points in the libraries as well as at key locations around the university. Information skills training programs, Closed Reserve, loans (including from other libraries), computer access, printing and photocopying facilities are also available.

The Library's extensive range of electronic information resources includes catalogues, databases, over 36,000 e-journals and Electronic Reserve. Online services include web information, reference and research assistance incorporating a real-time email reference service, online training, loan renewals, reservations and Inter-Library requests. Many of these services can be accessed on-campus and remotely 24 hours a day from the Library's website at:

www.lib.uts.edu.au

The Library is open for extended hours. More information is available on the website.

City Campus Library

Corner Quay Street and Ultimo Road
Haymarket
telephone (02) 9514 3388

Kuring-gai Campus Library

Eton Road
Lindfield
telephone (02) 9514 5313

Gore Hill Library (St Leonards campus)

Corner Pacific Highway and
Westbourne Street
Gore Hill
telephone (02) 9514 4088

CAMPUS LIFE

UTS Union

The UTS Union is the community centre for the University. It provides food and drink services, lounges and recreational areas, comprehensive social and cultural programs, funding for about 70 affiliated clubs and societies, sports facilities and programs, stationery shops, a newsagency and resource centres. Off campus the Union provides access to a rowing club, sailing club, athletics club and basketball stadium.

Union Office (City campus)
telephone (02) 9514 1444
email office@utsunion.uts.edu.au

City campus (Haymarket)
telephone (02) 9514 3369

Kuring-gai campus
telephone (02) 9514 5011

www.utsunion.uts.edu.au

Union Sports Centre

The centre contains multipurpose spaces, squash courts, weights rooms, circuit training room and outdoor basketball court.

CB04.1
City campus
telephone (02) 9514 2444

UTS Rowing Club

Dobroyd Parade, Haberfield
telephone (02) 9797 9523

Child care

UTS Child Care Inc. (UTSCC) coordinates all child-care services at UTS. Child care is available from 8.00 a.m. to 10.00 p.m. at both City and Kuring-gai campuses.

Care is available for 0–5 year olds throughout the year and for 5–12 year olds during school holidays. Child care can be accessed on a full-time, or part-time basis.

telephone (02) 8289 8400 (Ultimo)
or (02) 9514 2960 (City campus – Blackfriars)
or (02) 9514 5105 (Kuring-gai campus)

Child care subsidies

UTS child-care centres charge a fee, comparable to other child-care centres, of between $45–55 per day for 0–5 year olds and $25 a day for 5–12 year olds. All families who register with Centrelink can access Federal Government means-tested child-care subsidies of up to $29 per day through child-care centres.

Further subsidies are available at UTS child-care centres to all current UTS staff and students of up to $10.50 per day, funded by the University and the University Union and available on proof of employment/enrolment at UTS.

Low-income students may apply to the Equity & Diversity Unit for further assistance (funded by the Unit and the Students' Association) in cases of demonstrable financial hardship.

To obtain an application form, contact the Equity & Diversity Unit on:

telephone (02) 9514 1084

Co-op Bookshop

The Co-op Bookshop stocks the books on students' reading lists, and a variety of general titles and computer software. It has branches at the City and Kuring-gai campuses, and, at the start of semester, at Haymarket and Gore Hill (St Leonards campus).

City campus

telephone (02) 9212 3078
email uts@mail.coop-bookshop.com.au

Kuring-gai campus

telephone (02) 9514 5318
email kuringai@mail.coop-bookshop.com.au

www.coop-bookshop.com.au

Students' Association

The Students' Association (SA) is the elected representative body of students at UTS and represents all students of the University on welfare and education issues. UTS students have the right to stand for election of the SA and to vote in the annual elections. The Students Representative Council enacts, directs and coordinates the work of the SA.

All enrolled students are members of the SA and pay an annual fee. Revenue from fees is used to employ professional educational and welfare staff; fund the student newspaper, *Vertigo;* run the Peer Tutor Scheme and Second-hand Bookshop; and facilitate and support various information, education and action campaigns.

City campus

CB01.3
telephone (02) 9514 1155

Kuring-gai campus

KG02.4
telephone (02) 9514 5237

Radio Station 2SER-FM (107.3 FM)

2SER-FM is a community radio station situated on Level 26 of the UTS Tower. The station broadcasts a wide range of music with a particular emphasis on electronic and dance as well as a selection of talk programs covering everything from film and the arts to current affairs and health. All programs are presented and produced by volunteers.

Owned by Sydney Educational Broadcasting Ltd, 2SER was jointly established by the University of Technology, Sydney and Macquarie University in 1979. Students interested in broadcasting are invited to visit the studios:

Students interested in broadcasting are welcome to visit the studios:

CB01.26.22
City campus
telephone (02) 9514 9514

or for more information visit the website at:

www.2ser.com

UTS Gallery and Art Collection

The UTS Gallery is a dedicated public gallery on the City campus. The UTS Gallery presents local, interstate and international exhibitions of art and design. There are 12 exhibitions per year including design degree shows.

The UTS Art Collection comprises nearly 600 works including paintings, prints, photographs and sculptures which are displayed throughout the University.

CB06.4
City campus
702 Harris Street, Ultimo
telephone (02) 9514 1652
fax (02) 9514 1228
email uts.gallery@uts.edu.au

www.utsgallery.uts.edu.au

ENGLISH LANGUAGE STUDY SKILLS ASSISTANCE CENTRE

The English Languages Study Skills Assistance (ELSSA) Centre enhances teaching and learning at UTS through a focus on academic language development, which involves reading, writing, listening, speaking, critical thinking and cultural knowledge.

The Centre does this by:

- collaborating with faculties to integrate the development of students' academic language in their areas of study
- teaching custom-designed programs to meet the specific requirements and changing needs of undergraduate and postgraduate UTS students and staff
- fostering interest in, and knowledge of, language and learning through research, intellectual contributions and staff development, and
- valuing quality, diversity, internationalisation and flexibility as the Centre serves the wider academic and professional communities.

In addition to a wide range of free academic language development services available to UTS students who complete undergraduate and postgraduate degrees in English, the ELSSA Centre also offers the following elective subjects, award courses and programs.

For further details, contact:

Alex Barthel, Director
CB01.18.22
City campus
telephone (02) 9514 2327

or

KG02.5.22
Kuring-gai campus
telephone (02) 9514 5160
email elssa.centre@uts.edu.au

www.uts.edu.au/div/elssa/

Elective subjects

The ELSSA Centre offers three elective subjects aimed specifically at students from language backgrounds other than English. Some of these subjects may be completed during semester or in intensive mode during the February or July vacation periods.

Semester 1 or 2

59318	Seminar Presentation	6cp
59319	Communication for Employment	6cp
59320	English for Business	6cp

Undergraduate programs for international students

Advanced Diploma in Australian Language and Culture

- UTS course code: HA30
- Testamur title: Advanced Diploma in Australian Language and Culture
- Abbreviation: none
- Course fee: $6,000 (local)
  $9,000 (international)

The Advanced Diploma in Australian Language and Culture (ADALC) has been designed jointly by the ELSSA Centre and the Institute for International Studies for international students – either as a study-abroad year in their current degree (fee-paying), or as part of a university-to-university exchange agreement, or as a stand-alone program.

It can be taken at undergraduate or postgraduate level and allows students to enrol in subjects about Australian society and culture while tailoring a program to their own interests and level of English language competence.

Students audit classes in their area of study as an integral part of the ADALC.

The Advanced Diploma is aimed at two types of students:

- exchange and Study Abroad students who wish to complete the ADALC and return to their country, or
- international students who do not meet the UTS language entry requirements and who need to develop their academic literacy skills to enable them to enrol in undergraduate courses at UTS.

International students who complete the ADALC meet the UTS language entry requirements and, provided they meet academic entry requirements into faculties, are eligible to study at UTS.

Admission requirements

Students must have reached an English language competence level of 5.0 (IELTS) or TOEFL 510 (computer 180). Students with an IELTS of 6.0 or TOEFL of 550 are exempt from Semester 1.

Course duration

The Advanced Diploma is normally a two-semester program.

Course structure

This program is a 48-credit-point course, comprising six subjects.

Course program

Semester 1

59304	English for Academic Purposes 1	8cp
59306	Researching Australia 1 – Ethnography	8cp
59308	Australian Society and Culture 1	8cp

Semester 2

59305	English for Academic Purposes 2	8cp
59307	Researching Australia – Researching Students	8cp
59309	Australian Society and Culture 2	8cp

Other information

Contact the English Language Study Skills Assistance (ELSSA) Centre for more information on this program:

telephone (02) 9514 2327

Australian English Language and Culture Program

- UTS course code: n/a
- Testamur title: n/a – students receive a Statement of Completion
- Abbreviation: n/a
- Course fee: $9,000 (international)[1]

The Australian English Language and Culture Program (AELCP) is aimed at Study Abroad or exchange students who are not able to enrol in the Advanced Diploma in Australian Language and Culture.

This program enables international students from language backgrounds other than English to develop their English language skills through the study of aspects of contemporary Australian society and culture. Through both class activities and excursions, it introduces students to a range of intercultural issues and provides them with opportunities to interact with native speakers in order to develop the cultural understanding, skills, knowledge and confidence required to use English and participate actively in a variety of settings.

The program focuses particularly on oral skills and includes some participation in mainstream University classes. Students complete a major project using ethnographic research techniques.

Admission requirements

The program is designed for students whose language level is below IELTS 5.0 or TOEFL 510 (computer 180).

Course duration

This program is completed over two semesters.

Course structure

This program consists of two full-time subjects, comprising 24 credit points each.

[1] This program is not offered to local students.

Course program

Semester 1

59314	Australian English Language and Culture 1	24cp

Semester 2

59315	Australian English Language and Culture 2	24cp

Other information

Contact the English Language Study Skills Assistance (ELSSA) Centre for more information on this program:

telephone (02) 9514 2327

Postgraduate program for international students

Graduate Certificate in English for Academic Purposes

- UTS course code: HA80
- Testamur title: Graduate Certificate in English for Academic Purposes
- Abbreviation: none
- Course fee: $3,500 (local)
  $5,100 (international)

The Graduate Certificate in English for Academic Purposes (GCEAP) is aimed at international postgraduate research students who do not meet the UTS English language requirement but who meet all other entry requirements to commence studies at UTS at postgraduate research level.

Participation in the program is only possible for students who have already enrolled in a postgraduate research degree program elsewhere at UTS. Enrolment in the GCEAP is an integral part of the enrolment in a postgraduate research degree and emphasises the developmental approach of an integrated program.

Admission requirements

Applicants must:

- be international students
- be eligible to enrol in a postgraduate research degree at UTS, and
- have an IELTS score of 5.5 to 6.0 (minimum of 5.5 in writing) or TOEFL score of 530–550 (computer 197–213) or equivalent.

Other postgraduate students who meet the UTS language entry requirements and who feel they need to develop their language skills would also be eligible to attend the program.

Course duration

The first two subjects of the GCEAP are offered in the pre-session intensive mode (eight weeks before semester) and the final subject is offered concurrent with the first semester of students' enrolment in their research degree.

Course structure

In addition to being enrolled in a postgraduate research degree at UTS, students must complete the three compulsory subjects of the GCEAP (totalling 24 credit points).

Course program

59310	Postgraduate Study in Australia	8cp
59311	Academic English for Postgraduate Study	8cp
59312	Postgraduate Academic Writing in Context	8cp

Other information

Contact the English Language Study Skills Assistance (ELSSA) Centre for more information on this program:

telephone (02) 9514 2327

JUMBUNNA, INDIGENOUS HOUSE OF LEARNING

Jumbunna was relaunched as the Indigenous House of Learning (IHL) in 2001. Jumbunna has grown from being, in 1986, an Aboriginal student support centre, to become a successful academic, research and support centre with approximately 300 Indigenous Australian undergraduate and postgraduate students studying at UTS.

Jumbunna's role within UTS is to contribute to Australia's educational and social development by making UTS staff and students aware of Indigenous Australian cultures and associated issues. Jumbunna is committed to improving the quality of teaching and research at UTS by facilitating active links with the Indigenous community, higher education institutions and other professions with particular emphasis on Australia's growth as a multicultural nation.

Jumbunna IHL has a wide ranging, long term agenda that includes:

- involving Indigenous Australians in institutional decision-making and consultative structures, academic policy development and curriculums, and strengthening partnerships between it and the faculties
- broadening the awareness and acceptance of Indigenous Australian cultures, achievements, contributions, and contemporary issues by developing teaching subjects and awards
- broadening economic, social and political opportunities for Indigenous Australians, in particular expanding employment and income opportunities
- enhancing the teaching and coordination of postgraduate studies in Indigenous studies
- the provision of consultancy services to community and government, and
- improving accessibility, retention and graduation rates of Indigenous Australians in studies at UTS.

Reconciliation Studies elective

The subject Reconciliation Studies is offered by Jumbunna to all students. Offered for the first time in Autumn semester 2002, the subject is a transdisciplinary 6- or 8-credit-point elective available at both undergraduate and postgraduate levels.

Undergraduate

85208	Reconciliation Studies	6cp
85209	Reconciliation Studies	8cp

Postgraduate

85210	Reconciliation Studies	6cp
85211	Reconciliation Studies	8cp

For further details of these subjects, refer to the Subject Descriptions section at the back of this handbook.

UTS SHOPFRONT

UTS Shopfront is a University-wide gateway for community access to UTS. It links disadvantaged and under-resources community groups to University skills and professional expertise on a pro-bono basis. As part of the University's academic program, UTS Shopfront runs a Community Research Elective which is available to all students in all undergraduate and postgraduate courses (with Faculty approval).

Undergraduate

50293	Community Research Elective (UG)	6cp
50294	Community Research Elective (UG)	8cp

Postgraduate

50295	Community Research Elective (PG)	6cp
50296	Community Research Elective (PG)	8cp

For further details of these subjects, refer to the Subject Descriptions section at the back of this handbook.

PRINCIPAL DATES FOR 2003

January

1	New Year's Day – public holiday
2	Summer session classes recommence (to 7 February)
3	UTS Advisory Day
4	Closing date for change of preference (main round) to the Universities Admissions Centre (UAC), by mail or in person. Closing date (midnight) for change of preference (main round) UAC Infoline and website (www.uac.edu.au)
6	Provisional examination timetable available for Summer session
9	Supplementary examinations for Spring 2002
10	Last day to submit appeal against exclusion from Spring 2002
10	Due date for payment of Autumn semester 2003 tuition fees for continuing international students
17	Closing date for applications for non-award and cross-institutional enrolment in Autumn semester 2003
17	Late closing date for postgraduate research degree applications for Autumn semester 2003
17	Main round of offers to UAC applicants
20–25	Enrolment of new main round UAC undergraduate students at City campus
22	Closing date for change of preference to Universities Admissions Centre (UAC) for late round offers
24	Final examination timetable for Summer session available
27	Australia Day – public holiday
28	Public school holidays end (commenced 23 December 2002)
30	Closing date for applications for Postgraduate Coursework Equity Scholarships for Autumn semester 2003
31	Third round closing date for post-graduate coursework applications for Autumn semester 2003 (except Faculty of Business – closing date 14 February)
31	Late round of offers (UAC)

February

3	Closing date for change of preference to UAC for final round offers
3	Final closing date for UAC applications ($99 late fee)
5–6	Enrolment of late round UAC students at City campus
7	Last day to lodge a Stage 2 appeal against assessment grade for Spring semester 2002
7	Summer session ends for subjects with formal exams (commenced 2 December 2002)
8	Final round offers (UAC)
10–14	Enrolment of new postgraduate students at City campus
10–14	Formal examinations for Summer session
17–28	Orientation of new international students
20–21	Enrolment of new international students at City campus
24–28	Orientation week for new students
24	Last day to pay student services fees for Autumn semester 2003
26	Release of results for Summer session
26	Union 'O' Day – Clubs and activities day
26–28	Late enrolment days

March

3	Autumn semester classes commence
3	Last day to pay postgraduate course fees for Autumn semester 2003
5	Late enrolment day
12	Last day to lodge a Stage 2 appeal against assessment grade for Summer session
14	Last day to enrol in a course or add subjects for Autumn semester 2003[1]
17	Applications open for Thesis Completion Equity Grants
17	Applications open for Vice-Chancellor's Postgraduate Research Student Conference Fund (for conferences July–December)
31	HECS/PELS census date
31	Last day to withdraw from a course or subject without financial penalty[1]
31	Last day to pay upfront HECS/PELS for Autumn semester 2003

April

11 Last day to withdraw from a course or subject without academic penalty[1]

14–25 Public school holidays

18 Good Friday – public holiday

21 Easter Monday – public holiday

21–25 Vice-Chancellors' Week (non-teaching)

22–24 Graduation ceremonies (Kuring-gai campus)

25 ANZAC Day – public holiday

28 Closing date for applications for Thesis Completion Equity Grants

May

1 Applications open for undergraduate courses, where applicable, and post-graduate courses for Spring semester 2003

9 Provisional examination timetable for Autumn semester available

12–23 Graduation ceremonies (City campus)

23 Closing date for applications for Vice-Chancellor's Postgraduate Research Student Conference Fund (for conferences July–December)

30 Closing date for postgraduate research degree applications for Spring semester 2003

30 Final examination timetable available

June

9 Queen's Birthday – public holiday

13 Last teaching day of Autumn semester

14 Formal examinations for Autumn semester commence (to 4 July)

27 Closing date for applications for Postgraduate Coursework Equity Scholarships for Spring semester 2003

27 Closing date for applications for non-award and cross-institutional enrolment in Spring semester 2003

27 Last day to pay international fees (continuing students) for Spring semester 2003

July

4 Autumn semester formal examinations end (commenced 14 June)

7–11 Vice-Chancellors' Week (non-teaching)

7–18 Public school holidays

14–18 Formal alternative examination period for Autumn semester students

17–25 Enrolment of new students for Spring semester 2003

21–26 Orientation of new international students

21 Last day to pay student service fees for Spring semester 2003

23 Release of Autumn semester examination results

24 Formal supplementary examinations for Autumn semester students

28 Last day to pay postgraduate course fees for Spring semester 2003

28 Spring semester classes commence

August

1 Applications available for postgraduate research scholarships for Autumn semester 2004

1 Applications available for under-graduate and postgraduate courses for Autumn semester 2004

1 Last day to lodge a Stage 2 appeal against assessment grade for Autumn semester 2003

1 Last day to withdraw from full-year subjects without academic penalty

8 Last day to enrol in a course or add subjects for Spring semester 2003[1]

18 Applications open for Thesis Completion Equity Grants

29 Closing date for International Post-graduate Research Scholarships (IPRS)

31 HECS/PELS census date (Note: 31 August is a Sunday)

31 Last day to pay upfront HECS/PELS for Spring semester 2003

31 Last day to withdraw from a course or subject without financial penalty[1]

September

1 Applications open for UTS Academic Internships

5 Last day to withdraw from a course or subject without academic penalty[1]

15 Applications open for Vice-Chancellor's Postgraduate Research Student Conference Fund (for conferences January–June 2004)

29 Closing date for applications for Thesis Completion Equity Grants

29 Graduation ceremonies (City campus) commence (to 3 October)

29 Public school holidays commence (to 10 October)

29 Vice-Chancellors' Week (non-teaching) commences (to 3 October)

October

3 Provisional examination timetable for Spring semester available

3 Vice-Chancellors' Week (non-teaching) ends

6 Labour Day – public holiday

10 Public school holidays end (commenced 29 September)

24 Final examination timetable available

30 Closing date for applications for Postgraduate Coursework Equity Scholarships for Summer session 2003/4

31 Closing date for Australian Postgraduate Awards, the RL Werner and University Doctoral scholarships

31 First round closing date for postgraduate coursework applications for Autumn semester 2004, Summer session 2003/4 and for non-award and cross-institutional study in Summer session 2003/4

31 First round closing date for postgraduate research degree applications for Autumn semester 2004

November

7 Last teaching day of Spring semester

8–28 Formal examination period for Spring semester

17 Closing date for applications for UTS Academic Internships

24 Closing date for applications for Vice-Chancellor's Postgraduate Research Student Conference Fund (for conferences January–June 2004)

24 Last day to pay student service fees for Summer session 2003/4

December

1 Summer session commences (to 6 February 2004)

1 Last day to pay postgraduate course fees for Summer session 2003/4

5 Second round closing date for post-graduate coursework applications for Autumn 2004

8-12 Formal alternative examination period for Spring semester students

17 Release of Spring semester examination results

22 Public school holidays commence (to 26 January 2004)

25 Christmas Day – public holiday

26 Boxing Day – public holiday

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[1] HECS/PELS/Postgraduate course fees will apply after the HECS census date (31 March and August). Contact the relevant Faculty Office for further information about enrolment and withdrawal deadlines for flexible delivery subjects.

Note: Information is correct as at August 2002. The University reserves the right to vary any information described in Principal Dates for 2003 without notice.

FACULTY INFORMATION

MESSAGE FROM THE DEAN

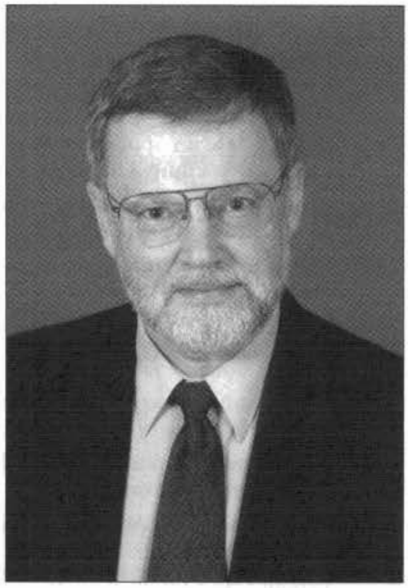
Welcome to the Faculty of Science, University of Technology, Sydney. For new students, I wish you a challenging, inspiring and rewarding experience with us as you undertake your studies. The graduates you will join in a few years have a very high reputation in Australian industry and the professions for their knowledge, skills and ethical approach to the practice of science.

Innovation and technological advancement are an important driving force for the Faculty of Science, and our courses prepare you for the challenges you will face in today's competitive environment. Courses are structured to provide a strong theoretical foundation and opportunities for independent study and gaining a broad range of applied laboratory or field based skills. All courses have a strong vocational focus. Our courses cater for a wide range of students, from those pursuing a professional head start to those satisfying their passion for knowledge.

Flexible and adaptable study patterns offered by the Faculty of Science accommodate the diversity of backgrounds of our students. The Faculty offers a wide range of undergraduate degree programs, Honours, Master's and Doctoral programs by research, and several postgraduate coursework programs. In addition to courses in key science discipline areas, the combined degrees offered by the Faculty are designed to equip graduates with the necessary links between science and other professions.

Our Faculty is committed to excellence in teaching, scholarship and research, and will continue to provide a supportive learning environment for students at all levels. The Faculty's strength in research has enabled it to significantly improve the quality of its laboratories and equipment, to the obvious benefit of its students.

This handbook provides you with the relevant course information you will need to complete your studies as smoothly as possible. I wish you an enjoyable and productive year and hope that you find professional and personal satisfaction during your time at UTS.



Professor Tony Moon
Dean

FACULTY MISSION STATEMENT

The purpose of the Faculty is to provide the highest quality graduate and postgraduate professional education and training to meet the needs of Australian industry and science; and to engage in research and allied professional scientific activities to bring economic and social benefits to the Australian and international community.

Its vision is to become a leading science faculty, recognised nationally and internationally for the quality of its teaching, research and community service programs. The Faculty has developed its reputation by producing Bachelor's and higher degree graduates who meet the needs of Australian industry and the professions, and by establishing strong links with Australian industry through cooperative education, research and development.

FACULTY OF SCIENCE

The Faculty of Science has established a sound tradition of providing quality teaching, research and consultancy. Graduates are renowned for their adaptability and work readiness.

The Faculty consists of several departments in biological and biomedical sciences as well as in physical, chemical, earth, and environmental sciences. The Departments of Applied Physics, Mathematical Sciences, Health Sciences and Chemistry, Materials and Forensic Science as well as the main Faculty Office are located at the City campus. The St Leonards campus houses the Department of Cell and Molecular Biology and a Dean's office. The Department of Health Sciences works on both campuses while operating the UTS College of Traditional Chinese Medicine on Harris Street and running the Acupuncture Clinic in Building 4 and Herbal Medicine Clinic at 645 Harris Street. The Department of Environmental Sciences is located on both campuses.

The Faculty provides high quality professional education in the physical, chemical, earth, environmental, biological and biomedical sciences, and engages in high-level research, scholarship and community service activities in support of the UTS mission, with a view to bringing social and economic benefit to the Australian community.

The Faculty offers a number of graduate and Honours degree programs developed to produce graduates for professional and vocational practice with an ability to continue their studies by research and to contribute to the knowledge base of their scientific discipline. Bachelor of Science and Honours programs are offered in applied chemistry, applied chemistry/forensic science, applied physics, mathematics, mathematics and finance, mathematics and computing, biomedical science, biotechnology, earth and environmental science, environmental biology, environmental and urban horticulture, medical science, nanotechnology and science. A Bachelor of Health Science and Honours program is offered in Traditional Chinese Medicine. Professional Experience is offered as an optional and additional component of all of the Bachelor of Science degree courses and leads to the award of a Diploma in Scientific Practice.

The Faculty is involved in the teaching of science to other faculties, including Engineering; and Nursing, Midwifery and Health. The Faculty is also involved in offering the following joint undergraduate degree programs:

- The Bachelor of Science, Bachelor of Laws degree course is offered in conjunction with the Faculty of Law. In order to qualify for separate awards in science and law, students are required to select an area of specialisation in science so that they can proceed to more advanced studies and thereby obtain recognition in relevant professional fields. Graduates from the course are qualified for professional practice as either scientists or lawyers and especially in areas where a knowledge of both disciplines is desirable.
- The Bachelor of Medical Science, Bachelor of Laws and Bachelor of Biotechnology, Bachelor of Laws double degree courses are similar in structure to the Bachelor of Science, Bachelor of Laws course but with a specialisation in medical science or biotechnology. Graduates qualify for professional practice in either field but may expect to be in most demand in those areas of law in which a knowledge of medical science or biotechnology is a particular advantage or, conversely, in areas of science such as the pharmaceutical industries where a knowledge of the law has special value.
- The combined degrees Bachelor of Science, Bachelor of Arts in International Studies; Bachelor of Medical Science, Bachelor of Arts in International Studies; and Bachelor of Biotechnology, Bachelor of Arts in International Studies provide students specialising in science, medical science and biotechnology with additional practical skills, in particular those that increase awareness of their international contexts through providing the opportunity to acquire knowledge and understanding of a language and culture other than English. Students are required to select an area of specialisation in science and a region or country of specialisation within the International Studies program. The length of these combined degrees is five years, full time, which includes one year of In-country Study. Graduates may work as professionals in their area of scientific expertise particularly in specialist positions where an understanding of a particular culture may be highly desirable.

- The combined degree Bachelor of Health Science in Traditional Chinese Medicine, Bachelor of Arts in International Studies provides acupuncture and Chinese herbal medicine students with greater exposure to, and understanding of, China's culture and a working knowledge of Chinese. The program makes it easier for Traditional Chinese Medicine graduates to practise outside Australia.
- The combined degree Bachelor of Science, Bachelor of Engineering; Bachelor of Biotechnology, Bachelor of Engineering; or Bachelor of Medical Science, Bachelor of Engineering integrates the theory and application of science and engineering to produce well-rounded graduates. In five years of full-time study, students choose from one of the Engineering majors and from one of the Science Programs. Depending on the combinations chosen, graduates are qualified to work in professional practice as well as in research and development.
- The Bachelor of Science, Bachelor of Business requires completion of Bachelor of Business core subjects, and subjects in one selected major with an equal subject load from one of the Science programs over four years of full-time study. Graduates may work as professional scientists or as business professionals. Career areas include management, marketing, finance, accounting or economics in enterprises in which high-level scientific expertise is desirable; the program also provides business expertise for scientists who wish to be administrators in research or other scientific institutions. The Bachelor of Medical Science, Bachelor of Business and Bachelor of Biotechnology, Bachelor of Business are similar in structure to the Bachelor of Science, Bachelor of Business with the science specialisation in medical science or biotechnology.

In the postgraduate area, the Faculty offers PhD and Master's degrees (by thesis), a Doctor of Technology, Master's programs (by coursework), Graduate Diplomas and Graduate Certificates. Prospective students should discuss possible topics of research with the relevant Associate Dean or Head of the appropriate department in the first instance. The research programs may be carried out on either a full-time or a part-time basis and it is possible for part-time students to undertake a portion of their research at a site external to UTS, provided appropriate supervisory arrangements can be made. Details of current research in progress can be obtained from the Office of the Associate Dean (Research).

The Faculty has a strong record of research and development, essential to the strength of both undergraduate and postgraduate programs. Competitive research funding is obtained across a wide range of areas of expertise. The Faculty wins a substantial part of the competitive grants awarded to the University. Much of the Faculty's research focuses on the activities of its research centres and units, including the Centre for Ecotoxicology (run jointly with the Environment Protection Authority), the Centre for Forensic Science, the Cooperative Research Centre for Renewable Energy, and the National Centre for Groundwater Management. This concentration of research has enabled the Faculty to improve significantly the quality of its major equipment in recent years, to the obvious benefit of its students.

In the development of all of the above programs the Faculty is assisted by appropriate advisory committees with members drawn from the wider community. The courses are regularly reviewed to ensure currency and relevance to industrial and commercial practice.

The Faculty has strong links with industry. Staff members maintain contact with industry by undertaking appropriate research and consulting activities.

For the Bachelor of Medical Science, Bachelor of Biotechnology and all Bachelor of Science degree courses, students have the option to spend a further 12 months working in a relevant industry. This leads to an additional award, a Diploma in Scientific Practice. The Faculty provides assistance to students in finding these professional experience positions. Part-time students may combine the Diploma with their normal work if it is relevant to their degree.

Most programs are available on either a full-time or part-time basis or a combination of both these attendance patterns.

ADVANCED RESEARCH INSTITUTES

In 2001, the University of Technology, Sydney established the following three new Research Institutes in Advanced Technology aligned to the national science priority areas.

Institute for the Biotechnology of Infectious Diseases

Institute for the Biotechnology of Infectious Diseases builds on UTS's existing high profile in the genetics, molecular biology and immunology of protozoan pathogens that are of veterinary or public health significance. The Institute constitutes a nationally identifiable and integrated area of research that has a scientific coherence derived from key technologies (functional genomics and proteomics) and disciplines (immunology and parasitology). It provides a focus for the research and development of products (diagnostics, vaccines and therapeutics), which will give it a competitive edge in a challenging environment. The Institute's key research areas are; gene regulation and stage differentiation in parasites; immunology of parasitic diseases and vaccine development; and molecular basis for parasitic virulence and drug resistance. Its areas of expertise include: the biology of parasites, especially coccidian in poultry, cattle and sheep and amoebic gill disease in fish; the molecular surveillance of disease-transmitting mosquito vectors; and antibody and immunotoxin engineering.

Institute for Nanoscale Technology

The Institute for Nanoscale Technology is a multidisciplinary research and educational institute that draws upon existing expertise in science and engineering to provide an exciting new focus for the future of nanotechnology at UTS. Nanotechnology is about manipulating nature's basic building blocks to make new materials and devices with unique properties. The Institute has two major research programs: applying nanotechnology to the areas of biomedical nano-materials and devices and to energy efficient nano-materials and devices. The Institute has developed two undergraduate nanotechnology courses, the Bachelor of Science in Nanotechnology and the Bachelor of Science in Nanotechnology Innovation. The first emphasises the tools required in developing new nanotechnologies and the science that enables these technologies (Bachelor of Science in Nanotechnology). The second emphasises the management of nanotechnologies and the entrepreneurial skills required to develop and commercialise nanotechnology initiatives.

Institute for Water and Environmental Resource Management

UTS has established an Institute for Water and Environmental Resource Management for further research into this field. The Institute gives pre-eminence to the following research themes:

- Interactions among groundwater, vegetation and salinity: some of the issues are the reliance of different ecosystems on groundwater availability for health and function, environmental allocations of water, amelioration of dry land salinity by trees, predictive modeling of dry land salinity and farm and regionally-based strategies for ameliorating dry land salinity.
- The urban and rural water cycle: including technologies for increasing water recycling, the economics of water recycling, better configurations for the provision of water and sewerage services, hydrological modeling of ground water pollution, and storage of recycled water in rock strata underneath urban.
- Ecotoxicology: especially the influence of stormwater, rural water run-off and water discharge from sewage treatment plants.

The Institute brings a trans-disciplinary approach to each theme with expertise in ecotoxicology, plant and animal physiology and ecology, hydrology and hydrogeology, and environmental engineering. It is taking a strongly collaborative approach with government, business and community groups.

UNITS AND CENTRES WITHIN THE FACULTY

Much of the Faculty's research is focused in the activities of several research centres, institutes and units. The Faculty also runs the UTS College of Traditional Chinese Medicine and administers two clinics. Details of the units, centres and the UTS College of Traditional Chinese Medicine can be found on the following pages.

Microstructural Analysis Unit

The Microstructural Analysis Unit (MAU) is a centralised large equipment resource within the Faculty of Science that provides UTS staff and students with access to state-of-the-art materials characterisation instrumentation and professional support in these techniques for research, postgraduate and undergraduate teaching and consulting. The unit offers accredited training programs in electron microscopy and microanalysis, scanning probe microscopy techniques and X-ray analytical methods. The MAU currently has five scanning electron microscopes, four scanning probe microscopes, three X-ray diffractometers, an X-ray Fluorescence Spectrometer, specialised specimen preparation facilities as well as advanced printing and image analysis facilities. All MAU equipment is available 24 hours a day, seven days a week to all staff and students within the Faculty of Science. External user access is available on a full cost recovery basis. The MAU is located in the low ground floor of Building 4, on the corner of Thomas and Harris Streets at City campus.

Immunobiology Unit

The Immunobiology Unit is a multidisciplinary research laboratory established in 1989 and located within the Department of Cell and Molecular Biology. The research undertaken in the Unit includes fundamental and applied studies of the immune system in both mammalian and non-mammalian models. The Unit pursues active research and provides high-quality postgraduate training programs in the fields of antibody engineering, tumour targeting, vaccine development, immunophylogeny and toxicology employing advanced techniques in molecular biology and protein characterisation. The research is supported by state-of-the-art equipment including automated gene sequencers, analytical and preparative HPLC, peptide sequencer, mass spectrometer, flow cytometer and biosensor. Research projects are supported by grants from external agencies such as ARC and by commercial contracts with industry partners.

The Immunobiology Unit is a key participant in the CRC for Sustainable Aquaculture of Finfish which commenced activities in July 2001. The CRC program is aimed at developing improved strategies for vaccination of farmed fish.

In July 2001, the Unit combined with other researchers in the Department of Cell and Molecular Biology, in particular the Molecular Genetics Unit, to establish the Faculty Research Strength in Molecular Biotechnology.

Molecular Parasitology Unit

The Molecular Parasitology Unit was established in 1991 as a laboratory investigating evolution, taxonomy, differentiation and diagnosis of parasites based on molecular methods. Its research objective is to generate and compare gene sequences. The Unit has an international reputation in this area, and trains visiting overseas researchers and students, in addition to providing high-quality postgraduate training in molecular biology research to local scientists and students. The Unit is ultidisciplinary, relying on molecular techniques developed, used and taught in the Department of Cell and Molecular Biology, and mathematical analyses and computing practices undertaken in the Department of Environmental Sciences.

In May 1997, the Unit was recognised as a Key University Research Strength when more staff from the Department of Cell and Molecular Biology and the Department of Chemistry, Materials and Forensic Science added their research skills to the Unit to become a major Australian focus for molecular parasitology research and teaching.

Molecular Genetics Unit

The Molecular Genetics Unit is a focus for basic and applied molecular biology research, primarily into human disease. The research undertaken in the Unit encompasses investigations into the causes of drug and radiation resistance in human cancers; novel approaches to treatment of Type II diabetes by gene therapy; and the regulatory mechanisms involved in epigenetic imprinting, specifically female X chromosome inactivation. The Unit provides high quality Honours and postgraduate research training in advanced techniques in molecular and cellular biology such as automated DNA sequencing, PCR, flow cytometry, bioinformatics, protein identification and expression, investigation of DNA: protein interactions and functional genomics. Research projects are supported by grants from external agencies such as NHMRC and by commercial contracts with industry partners.

Health Psychology Unit

The Health Psychology Unit (formerly the Psycho-Oncology Unit) was established in 1973 within the Department of Cell and Molecular Biology. It now carries out research into the effects of emotional states on cancer recurrence in early and late stage breast cancer using cognitive behavioural therapy in groups. Other current projects include working with palliative care services to assist patients and families cope with end of life issues and a community service project to assist 'at risk' adolescents to manage their anxiety and depression. The Unit is funded through donations by the community and business sectors.

UTS College of Traditional Chinese Medicine

The UTS College of Acupuncture was established in 1994, founded on the experience and educational expertise of Acupuncture Colleges (Australia). With 25 years' experience, Acupuncture Colleges (Australia) previously offered Diploma and Bachelor's programs accredited by the New South Wales Ministry of Education. The decision to transfer acupuncture education to the University was in accord with the growth in acceptance and use of acupuncture in Australia, and the need to provide a standard of education at a level expected by the community.

In 1995, the College was incorporated into the Faculty of Science as part of the Department of Health Sciences. In 1997, the College of Acupuncture was renamed the UTS College of Traditional Chinese Medicine.

The Faculty of Science offers an undergraduate course in Traditional Chinese Medicine over a four-year period. In addition to the undergraduate degree, the Faculty offers a Master of Health Science in Traditional Chinese Medicine (by coursework) that provides graduate education in Chinese herbal medicine to qualified applicants who wish to extend their existing knowledge of herbs or gain new knowledge of another branch of Chinese Medicine to incorporate into their existing clinical practice. Studies leading to a Master of Science or PhD by research are also available.

The Faculty administers two clinics, one offering acupuncture and Chinese Remedial Massage (*tuina*) services, and the other offering Chinese herbal services to the community. These clinics also play a major role in the clinical education of Traditional Chinese Medicine practitioners and students. One clinic operates in Building 4 on Harris Street (acupuncture/*tuina*), while the other operates from level 4, 645 Harris Street (Chinese herbalism).

In the development of all programs, the Faculty is assisted by advisory committees comprising members of the education, health and Traditional Chinese Medicine professions. The courses and specific subjects are also under ongoing review and development to ensure their relevance to traditional Chinese medical practice.

Students entering the Bachelor of Health Science in Traditional Chinese Medicine are eligible to apply for places in the combined degree: Bachelor of Health Science in Traditional Chinese Medicine, Bachelor of Arts in International Studies (China major). Academically selected students enter this program at the beginning of their third year. The combined program extends the course length to five-and-a-half years, one year of which is spent in China studying language, culture and Traditional Chinese Medicine.

Students of the UTS College of Traditional Chinese Medicine are strongly recommended to read the Code of Conduct for Students of the UTS College of Traditional Chinese Medicine under the section on Information for Students in this handbook.

All course inquiries should be directed to:

Bob Hayes
UTS College of Traditional Chinese Medicine
4/645 Harris Street
Ultimo NSW 2007
telephone (02) 9514 2500

Centre for Ecotoxicology

This Centre is a joint enterprise of UTS and the NSW Environment Protection Authority (EPA), and is located at the St Leonards campus of the University. The aims of the Centre are to promote education, research and information transfer in the field of ecotoxicology. This is a newly emerging discipline that has arisen as a result of the dependence of modern society on the use of chemicals. It is a meeting point of chemistry and biology – the study of the impacts of chemicals and mixed effluents on communities in affected areas.

The Centre coordinates research programs at Honours, Master's and Doctoral levels. Teaching and research supervision involve a collaboration of both UTS and EPA staff. The research work of the Centre involves consultation with industry and government in identifying areas in which investigation is needed on the impact of chemicals on native flora and fauna under Australian climatic and other environmental conditions. A foundation of scientific knowledge is required in order to ensure the development of appropriate environmental quality guidelines for this continent.

The University arm also offers an independent investigative and testing service for industry, through the UTS commercial company, Insearch Limited.

Centre for Forensic Science

The Centre for Forensic Science commenced operation in 2002. It consists of UTS core and associate members from the Faculties of Science, Law, Engineering and Information Technology, as well as industry partners. The Centre promotes forensic science as a multidisciplinary methodology applied within a scientific, legal and political structure. The Centre aims at the provision of high-quality education, enhancement of professional practice and the integration of high-calibre research and independent services for the benefit of the community at large.

The Centre capitalises on the well-established UTS forensic programs and organises short courses and professional seminars for law enforcement agencies, forensic organisations and practitioners, insurance companies, legal firms and various research institutes.

Research programs are in the areas of fingerprints, questioned documents, trace evidence, fire investigation and analysis, illicit drugs, toxicology, DNA profiling, materials and engineering, statistics and data handling, and artificial neural network applied to forensic classification (see www.forensics.edu.au for details).

The Centre also offers an independent investigative and consulting service through the UTS commercial company, accessUTS Limited.

Cooperative Research Centre for Renewable Energy

The Cooperative Research Centre (CRC) for Renewable Energy commenced operation in late 1996. It is incorporated in Western Australia. UTS is one of the eight university members of this CRC. The UTS participants include members of the Faculty of Engineering, the Department of Applied Physics, the Faculty of Design, Architecture and Building, and the Centre for Materials Technology. The CRC's work ranges over many areas of renewable energy technology including solar cells, solar thermal systems and energy efficient technologies. The UTS contributions are predominantly in the area of energy efficiency including novel electric motors, energy efficient glazing, and new daylighting and lighting systems. There is also a major contribution to the development and assessment of computer software for use in the design of energy efficient buildings.

The CRC will have a major impact on Australia's contribution to technologies which will reduce greenhouse gas emissions and will open up a range of new industries. It is anticipated that these new industries will generate considerable income for the country, and a wide range of new employment opportunities. The UTS participants are constructing special systems for the accurate specification of building components as needed for complex computer models that address lighting and energy flows in buildings. There are strong links with companies in Sydney and Canberra.

National Centre for Groundwater Management

The National Centre for Groundwater Management is a joint enterprise between the Faculties of Science and Engineering, with the general aims of researching groundwater problems of strategic national importance, coordinating and developing postgraduate courses and continuing education programs, and liaising with industry.

The Centre is recognised by the Federal Government through the Land and Water Resources Research Development Corporation as a national centre for research and consultancy training in groundwater and environmental applications.

In addition to PhD and MSc (by research) degree programs in groundwater, the Centre offers two courses as a collaborative effort between the Faculty of Science and the Faculty of Engineering, namely, the Master of Science in Hydrogeology and Groundwater Management and the Graduate Diploma in Hydrogeology and Groundwater Management. There are flexible arrangements for each program: part-time, full-time and distance mode. Further details are given in the section on postgraduate courses.

For inquiries contact:

Professor Michael Knight, Director
National Centre for Groundwater
Management
CB01.17.15
telephone (02) 9514 1984
fax (02) 9514 1985
email groundwater.management@uts.edu.au
http://groundwater.ncgm.uts.edu.au/ncgm/

INFORMATION FOR SCIENCE STUDENTS

Students in the Faculty of Science are strongly encouraged to read the handbook and the *UTS: Calendar* (particularly Chapter 2, General Information) for advice on student administration matters. The *UTS: Calendar*, the official information guide to UTS courses, rules and regulations, may be purchased from the Co-op Bookshop on the corner of Harris Street and Broadway. Copies are available for perusal at the UTS Library and at the Student Info & Admin Centres at City campus, Broadway (CB01.4) and Kuring-gai campus (KG01.6.01). Copies are also available for viewing in each Department and Faculty Office at both the St Leonards and City campuses. The *UTS: Calendar* contains valuable information about the different services available to students, student admission requirements, enrolment, examinations, exclusion, progression, graduation, HECS, Austudy, Abstudy and other important matters. The Calendar is available online at:

www.uts.edu.au/div/publications/cal/index.html

Environment, Health and Safety

Statement of aims

The University is committed to providing a safe and healthy workplace for students, staff and visitors and adopting a socially responsible approach towards protecting and sustaining the environment. It aims to be at the forefront of environment, health and safety practice in higher education.

To this end UTS will:

- prevent or control hazards that could result in personal injury or ill-health
- manage accidents and incidents that do occur in order to minimise harmful effects and to prevent recurrence
- promote safe and environmentally sound practices among the UTS community
- carry out its teaching, research and organisational activities in ways that protect the environment from harmful effects, and
- integrate environment, health and safety issues into its curricula and research as appropriate.

Personal responsibility

- Always remember that health and safety are everybody's responsibility. Everyone is required to demonstrate a responsible attitude towards environmental, health and safety issues, and especially their impact on laboratory and fieldwork.
- Students must know how to report emergencies, accidents and incidents, and what action they should take to minimise or eliminate hazards.
- Students should never do anything without considering the risks of their actions in relation to the health and safety of others and, if students are intending to carry out any unfamiliar work which might pose a health, safety or environmental risk, they should always make sure they get appropriate information, advice or instruction before they start.

Workload guidelines

Full-time study within the Faculty of Science is expected to take up about the same amount of time as normal full-time work. Adequately prepared students studying effectively should expect to achieve satisfactory grades if they devote that amount of effort to their study. High grades may require more effort.

The Faculty:

- assumes that students devote approximately 100 minutes of study (including class time) each week of semester for each credit point attempted
- will ensure that, as far as possible, subjects or assignments of equal value require the same effort to achieve an equivalent outcome, and
- wishes to ensure that the timing of assignment submissions avoids pressuring students to devote too little time for satisfactory completion of a set task and attempts to adjust its assessment schedules and weightings to that end.

Subjects or assignments that cannot comply with the above principles should be explicitly identified at the commencement of semester.

Students are invited to point out circumstances in which these principles appear to be contravened. They should do this by writing to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Feedback from academic staff

It is Faculty policy that each student is entitled to feedback on his or her performance in an assignment or subject. No assignment mark or grade in the Faculty of Science should be given without additional feedback to the student, or a clear statement of how, when and where such feedback can be obtained.

Feedback should include at least one comment that is specific and sufficiently constructive to assist the student's learning.

Statement of good practice and ethics in informal assessments

The 'Statement of good practice and ethics in informal assessments' is included here because the statement is taken very seriously by the Faculty and we encourage students to take it seriously too.

1. Aims of informal assessments

The term 'informal assessment' at UTS is defined as any assessment task other than a final examination that is administered by the Registrar and held in the official UTS Examination Weeks. Such assessment is in no other sense 'informal', especially as it contributes to the final assessment of the student in the subject.

Common forms of such assessment in the Faculty of Science include:

- practical reports
- computer programs
- essays and assignments (including reports of field work), and
- tests and quizzes.

The setting and assessing of these tasks is aimed at promoting the following educational aims:

- furthering each student's learning of the subject
- the acquisition of practical skills of laboratory and field work, and their documentation
- providing a means for staff to assess each student's learning
- providing feedback to the student on progress in learning, and
- providing feedback to staff on the effectiveness of their teaching.

These aims will be subverted if students deceive staff about either the authenticity of results, or the authorship of their written work.

Such behaviour is unethical, unprofessional and completely unacceptable. Within the western tradition of scholarship it is regarded as a serious academic offence.

It is recognised that students may sometimes find themselves in positions of extreme stress, for reasons of illness or misadventure, when malpractice may seem tempting. In such circumstances, however, other solutions are available, for example, seeking extra time for the submission of an assignment, accompanied by a medical certificate and/or other compelling explanation.

2. Unacceptable behaviour

Cheating in all its forms is unacceptable behaviour, **and is not condoned**. Cheating is a breach of the University Rules. Examples of cheating include:

2.1 Outright lying

This is never acceptable under any circumstances. Remember that lying, in science, includes inventing or falsifying results.

2.2 Plagiarism (copying)

The *Oxford Dictionary* defines plagiarism as the taking and using of another person's thoughts, writings or inventions as one's own. It includes unacknowledged quotations from other authors (books, journals, fellow students), or the copying out, perhaps with changes intended to disguise, of slabs of other people's work. Don't copy!

2.3 Collusion

Collusion is a fraudulent, secret understanding between two or more people to deceive, for example, in 'fixing' results, or doing one essay together and rewording it slightly to pass it off as two independent efforts.

2.4 Use of unauthorised material or equipment

Only equipment or material specified by the coordinating examiner may be used by a student during examinations, class tests and quizzes. Don't write on rulers, calculator cases etc.! Cheating is not condoned and will be dealt with appropriately.

3. Acceptable practices

3.1 Acknowledging sources – referencing

Whenever any other person's work is used in the formulation of a written piece of work, it must be clearly indicated where the source of the information lies. The 'other person' could be a published or unpublished author, your lecturer, or one of your fellow students. Consult the various guides to writing assignments that are held in the library (and any that your lecturers may provide). As you prepare the assignment, keep a detailed running record of your references in a notebook, and use a standard referencing system, e.g. the Harvard system. Often references cannot be found again later.

3.2 Collaboration

In many cases, experiments and other means of data collection require students to cooperate. Some assignments may involve an ideas-gathering stage followed by the writing-up phase.

While collaboration is normally encouraged in the developmental and experimental stages, **final data analysis and interpretation and writing-up** must be strictly your own effort (except in any exceptional circumstances that would have to be spelt out in detail by your lecturer).

4. Guide for good practice in written work

(Adapted from the statement prepared by the Faculty of Humanities and Social Sciences.)

4.1 Writing essays or assignments

Developing the ability to express yourself and argue clearly and in your own words is an important part of your university studies. Students are often confused, however, about just what is expected of them in written work: on the one hand, they are asked to present their own original ideas and arguments yet, on the other, they are told to use and take account of ideas, concepts and theories, etc., in the material they read. In fact, an important element of a well-written piece of work is the way that a student meets these two, apparently conflicting demands.

4.2 Originality

'Being original' in an essay, for instance, **does not** mean that you have to think up your own theories and concepts, etc. Rather, it refers, in part, to the way you make use of – by critiquing, analysing, evaluating, synthesising, exemplifying, instancing – the ideas, theories, evidence, etc. of other writers or of experimental or secondary data (e.g. census statistics) in constructing a coherent and plausible argument.

4.3 Arguing a case

Strictly speaking, an 'argument' refers to the reasoned advancement of a number of propositions leading to a particular conclusion. In an essay, it means that having read and considered the relevant literature, and on the basis of this and any other appropriate evidence, you come to a conclusion about the question. In writing the essay, you set out the argument, or a series of arguments, to support that conclusion. In doing so, you draw on relevant ideas, etc., from your reading, using them to support your argument. In cases where experimental data form the basis of the written work, your task may be to argue the case of how the data support or falsify a hypothesis.

Whether you are asked to argue, discuss, evaluate, compare and contrast, analyse, critique, consider, **you are still being asked to mount a reasoned argument**, in one form or another, leading to a conclusion based on an evaluation of all the evidence presented in your reading or provided by the data. For example, some essay questions may ask you to discuss or evaluate two conflicting arguments; in this case you have to decide – on the basis of the arguments themselves, any other evidence, and perhaps with the help of what some other writers say – which is the stronger or more adequate of the two and then argue that, giving evidence in support.

In a sense, you could think of writing an essay, assignment or report (some of which might require different formats) rather like designing and erecting a building. All the possible and available building materials (bricks, timber, concrete, steel, roofing, etc.) would be equivalent to all the reading you have done or experimental data you have acquired. You certainly cannot just throw a stack of materials on to a block of land and expect them to form the building. Rather, you would need to, firstly, get a general idea of the sort of building that is appropriate by considering all the relevant factors (such as size and lie of the land, accommodation required and building restrictions); secondly, design a structure which takes all of these factors into account, selecting materials to hold up the structure and rejecting those which would not. In a similar way you need to think carefully about all the information you have and decide what is relevant and what you can generally conclude from it; then design or plan it into a coherent and cogent argument supporting that position.

The actual argument (the design) is your original contribution; the support for that argument comes from all the data, ideas and theories, etc., you considered and the evidence used (the materials). Hence, it is the way you **critically analyse, evaluate, select and synthesise information and use it in your argument** which is important in the work. You do not create something totally new, nor do you merely throw together other people's ideas. Do not make the mistake of thinking that it is sufficient for you to merely compile into some coherent order other people's referenced ideas, etc. – the bulk of the essay has to be your own work.

Re-marking of assessment items

Occasionally, you might not be clear about why you received a lower than expected mark, or you might feel that your work has not been fairly assessed.

Initially, you should discuss the matter with the marker or Coordinating Examiner (CE) concerned. Such discussions are part of routine academic procedure by which you receive advice, clarification and feedback about your performance.

Usually, the result of such a discussion will be either:

(i) the marker or CE will satisfy you that the mark is fair, or

(ii) you will satisfy the marker or CE that the item was not fairly marked. For example, the marker or CE might have misread a section of your paper. In such cases, the marker or CE will adjust the original mark accordingly.

Sometimes, however, agreement cannot be reached. For example, you might consider that the point of view of the marker or CE does not allow a disinterested assessment of a particular item. In these cases, you may request that the item be re-assessed by a second marker.

UTS College of Traditional Chinese Medicine (TCM)

Code of Conduct for students of the UTS College of TCM

Rule 2.4.2 of the University states: 'Whilst on the premises of the University or engaged in any activity related to their study at the University, students shall comply with any reasonable directive given to them by an officer of the University, and shall maintain an acceptable standard of conduct.'

Rule 2.4.5 of the University states: 'Where the Responsible Academic Officer, in consultation with the appropriate External Supervisor (if any), considers that a student so assessed is not ready to proceed with or is unsuitable to continue any part of the required professional experience on its scheduled commencement, the Responsible Academic Officer may defer or re-schedule the student's participation.

The Responsible Academic Officer must advise the students, in writing, of the decision within three business days of making it.

Where the deferral of a student's participation in any part of the required clinical education program would have the effect of preventing the student from continuing his or her course, the Responsible Academic Officer may refer the matter, with appropriate recommendation, to the Vice-Chancellor, who shall take such action, as he or she deems appropriate.

The Vice-Chancellor must advise the student in writing of the decision within three business days of making it.

In addition to Rule 2.4.2. and 2.4.5, students are required to sign an agreement to observe the UTS College of Traditional Chinese Medicine Code of Clinical Conduct. This agreement is an undertaking to observe clinical policy and procedures, to maintain a duty of care to patients and fellow students, and to demonstrate an acceptable level of professional conduct.

Clinical dress

The high neck, shoulder buttoning, white, 'dentist'-style jacket has been approved as the College's regulation clinical dress for students. Students not dressed in the approved clinical style will not be permitted to attend the clinic session. Students are also required to wear one colour, closed shoes, with a plain skirt or trousers in a conservative colour. Sneakers, runners, sports shoes and jeans are not acceptable clinic wear. All clothing must be clean.

It is strongly recommended that all jewellery that can potentially interfere with clinical practice not be worn for the duration of each clinic session. Long hair should be tied back neatly and must look clean and tidy. If nail polish is worn it should be unchipped and of a single colour. It is recommended that nails are kept short, clean, and natural. Heavy perfumes should not be worn.

Nametags must be worn by all students in the clinic. Students without a nametag may not attend patients.

The standard of cleanliness and the general appearance of students attending College clinics is subject to the approval of the individual practitioner-in-charge or clinic manager. A student who does not meet the required standards may be refused permission to attend their rostered clinic session. Students may also be asked to remove visible jewellery at the discretion of the practitioner or clinical manager.

Refusal of services

As recommended in the *NSW Skin Penetration Guidelines (1999)*, page 8, practitioners and students should refuse TCM services to patients who are drunk, under the influence of mind-altering drugs, abusive, or who exhibit antisocial behaviour. They also have the duty to refuse to carry out services that are illegal, or that they believe have the potential to endanger the health of the patient or themselves.

Students are advised to refer pregnant women to the clinical supervisor or practitioner for assessment and treatment or seek guidance from the clinical supervisor or practitioner if undertaking final year clinic.

In all instances precautions apply to patients who are:

- famished or have overeaten
- over fatigued
- frail and weak, and
- pregnant.

External clinical training

The College office keeps a list of practitioners who have been approved by the University and who are willing to allow students to attend their private clinics for pre-internship levels of clinical experience. Students should contact the practitioner they wish to attend before making application at the College office. Application forms must be lodged with the college prior to beginning external clinical training. Clinical hours will be credited only if completed with an approved UTS honorary external practitioner. Guidelines for external practitioners to be placed on the UTS approved list can be obtained from the office.

Practicums

During practicums in acupuncture, moxibustion, treatment techniques and massage, students will be required to carry out therapeutic and diagnostic procedures on fellow students. These practical sessions and workshops are under the supervision of a practitioner and all standard procedures and infection control measures must be observed. Students who decline to participate in giving and receiving treatments in practicums are unable to complete these subjects and are therefore unable to complete the course.

Policies of the UTS College of TCM

Discrimination

In line with State and federal anti-discrimination legislation, UTS has a policy of equal opportunity and non-discrimination. This policy is not only applied to students and staff but also to community services. Students should be aware that the patients of the University's clinical services are included, and that anti-discrimination laws must be observed. The students and staff should be mindful of the rights and needs of patients irrespective of circumstances including sex, age, religion, ethnicity, sexual preference or presenting condition.

If treatment is refused then it is the responsibility of the attending practitioner or clinic manager to inform the patient; not the student. In fourth year, this responsibility must lie with the clinical manager.

Privacy, Confidentiality and Health Records

Information about an individual who can be identified from that information falls under the *Privacy Amendment (Private Sector) Act 2000* and extends the operation of the *Privacy Act 1988* protecting personal information, including health information. The act complements the existing practice of confidentially at the TCM clinics pertaining to all matters relating to patients and their health. On page iv of the *Privacy Amendment (Private Sector) Act 2000* health information is defined as personal information:

- about an individual's health (past, present and future)
- about an individual's expressed wishes regarding their health
- about health services provided or to be provided
- collected whilst providing a health service, or
- collected in connection with the donation or intended donation of body parts and substances.

Health information also includes:

- medical information,
- personal details such as address, name, treatment dates, billing information and Medicare number, and
- information generated by the health service provider including notes and opinions about an individual and their health.

The Privacy Act also includes information of a 'sensitive nature' including information about an individual's racial or ethnic origin, political opinions, religious or philosophical beliefs, professional and trade association membership, union membership, sexual preferences or practices, or criminal record (p vii).

No identifiable information about a patient is to be released outside of UTS TCM staff and students without the practitioner's authority and a written and signed consent from the patient. This includes the release of information to family members, friends, insurance companies, employers, legal representatives and other practitioner's external from the university. Confirmation of patient information release should be noted in the patient's file. It is unethical to discuss any patient outside the treatment situation. Patient cards and records must not be removed from the clinic and must be stored in locked files.

A medical record report should be:

- accurate, brief and complete
- legibly written
- objectively written
- note any extraordinary incidents or accidents
- not have any uncommon abbreviations
- dated
- signed by the practitioner and the name printed of the attending student on the record, and
- written in blue or black ink only.

Medical records are legal documents and must be treated as such.

- All information pertaining to the medical record is confidential and is not to be discussed outside of the treatment area.
- Medical records are not to be taken out of the Clinic area.

- If the medical record is to be used as a case study there should be no reference to any personal details or identifying data such as name and address.
- Personal details and medical histories should be treated with respect and are to be treated in a serious, mature manner.

Recording patient information

Details pertaining to the health and medical history of a patient must be recorded on the patient's clinical record in chronological order of each visit. Sometimes patients confide personal histories that do not have a primary bearing on their health and which they request should not be recorded. In such instances the patient's wishes should be respected. If the disclosure has a bearing on the primary condition of the patient, or will be a significant factor in their response to treatment, it must be recorded. The patient should be advised of this requirement and given the option of seeking treatment elsewhere. When a phone consultation occurs between the practitioner and patient a notation should be made in the patient's file.

Patient records

If a student is asked to treat or to care for a patient, it is the student's responsibility to familiarise themselves with the patient's current condition and to check the patient's clinical records. It is not the responsibility of the clinical manager or the supervising practitioner, although they may advise the student, at their own discretion, of any issues that they deem to be important. It is also the student's responsibility that all information is entered into the computer and the hard copy of the patient's record is returned to a secure location; that is the filing cabinets.

All patient records remain the property of the university and at no time should these be removed from the clinic premises. Inactive patient records (patients not attending clinic over a period of time) are archived and stored. Patients can request a copy of their records but are not allowed to remove or change any information on that record.

The patients record should contain information about the:

- date of consultation
- consulting practitioner
- presenting problem and reason for consultation
- management plan
- treatment given including any prescribed medications (herbs)
- other preventative advice including dietary, lifestyle changes, exercises etc., and
- patients on medication and/or attending another practitioner.

It is unethical to comment on any course of treatment or medication provided by another practitioner, or to advise in any manner on a course of treatment provided by another practitioner. All decisions regarding therapeutic choices belong to the patient and, even if a patient asks for advice on the appropriateness, or otherwise, of a therapeutic procedure, it is not acceptable for a student or student/practitioner to comment on matters outside their area of expertise.

Informed consent

All patients should be informed of the purpose, benefits and possible risks of treatment, including adverse reactions from treatment. This allows the patients to make up their own mind as to whether to commence treatment or not. Informed consent is both a legal and ethical requirement..

Student health and welfare

It is important that students, especially those entering a healing profession, should maintain good health and general well-being during their studies. The University has a Student Health Service that offers both health care and counselling services.

Students will be participating in the University's acupuncture, *tuina* or Chinese herbal medicine clinics as observers, assistants and, in their final year, as student practitioners. It is not appropriate for anyone with an infectious condition to work closely with patients. Should students be suffering from any temporary, communicable disease they must advise their clinical supervisor. Students who believe that they may be coming down with a cold, or some minor ailment, are advised to inform the clinical supervisor and/or arrange for completion of clinical hours at an alternate time. Students who are HIV positive or who have a hepatitis infection must be aware of their duty of care to staff, other students, and patients during clinical practice.

Advice from the NSW Department of Health

'The Department, bearing in mind its recommendations to the general community, would hope that all students were adequately immunised against poliomyelitis, diphtheria and tetanus in childhood. They should have had a booster of Sabine vaccine against poliomyelitis and a booster of Adult Diphtheria Tetanus Toxoid (ADT) at about 25 years of age. In addition, persons particularly involved in health services would be wise to have had a Mantoux test and, if seronegative, to have had BCG vaccination (for tuberculosis).'

The guidelines of the College in relation to hepatitis B and health care workers and students indicate the need for hepatitis B immunisation before contact with blood/body fluids and state that it is their obligation to know their current hepatitis B status.

Hepatitis B inoculation and Mantoux testing

Students entering the course are advised that, for their own protection, they should contact the Student Health Service at the City campus to arrange for a hepatitis B inoculation. These are available at a minimal cost to all acupuncture students. Immunisation against tetanus and tuberculosis is also recommended for your protection.

Information regarding Mantoux testing is also available through the Student Health Service.

The Student Health Service can make individual or group arrangements for students to receive hepatitis B and tetanus vaccinations at any time. The Service is also able to offer advice on tuberculosis vaccination.

Further information on these matters is available from the Student Health Service, City campus:

telephone (02) 9514 1166.

STUDENT LEARNING CENTRES AND BRIDGING COURSES

Chemistry Learning Resources Centre

The Chemistry Learning Resources Centre is located at City Campus (CB04.2.11). It has a range of resources to support the learning of chemistry by undergraduate students from the Faculties of Science; Nursing, Midwifery and Health; Engineering; and Business. Resources available in the Centre include microcomputers equipped with interactive software, videos, models and books. Most of the resources are for first-year students but there are also resources for students studying chemistry in the later stages of their degree program. The Centre is open each weekday during semester. Further information may be obtained by visiting the website at:

www.science.uts.edu.au

or by contacting the coordinator:

Rosemary Ward
telephone (02) 9514 1729
fax (02) 9514 1460
email Rosemary.Ward@uts.edu.au

Mathematics Study Centre

The Mathematics Study Centre provides support services to all students at the University studying mathematics and quantitative areas, including statistics. The Centre coordinates all mathematical support services across the University, and is available on both the City and Kuring-gai campuses. The Centre is located at CB01.16.15, City campus and at KG02.5.22, Kuring-gai campus.

Drop-in service

The Centre is open during semester, including tutorial and study weeks. It runs evening sessions and Saturdays, by appointment, to cater for part-time students. Students can drop in to the Centre to obtain help with problems specific to a particular course, or they may choose to study in the Centre on a regular basis, obtaining assistance from a lecturer as needed. A timetable listing availability of lecturers and their particular areas of expertise is available from both branches of the Centre and its website.

Tutorial support

The Mathematics Study Centre offers support tutorials for students who have difficulty with their mathematics and statistics studies at first-year level. Where a need exists, students enrol in one of the subjects listed below. This can be arranged separately for students in any faculty; the subjects have previously been run for students in Mathematical Sciences; Business; Engineering; Information Studies; Nursing, Midwifery and Health; and Teacher Education. These subjects are free of HECS charges and carry no credit-point value.

Subjects offered

94434, 94435, 94436 Mathematics Tutorial 1, 2, 3

94437, 94438, 94439 Mathematics Study 1, 2, 3

94431, 94432, 94433, 94440, 94441, 94442 Mathematics Workshop 1, 2, 3, 4, 5, 6

94482 Quantitative Research Support

Individual assistance

It is possible for students to arrange individual assistance with mathematics if recommended by a Counsellor from Student Services. This is particularly appropriate if a student has a record of failure in mathematics subjects or suffers from low self-confidence. It is also appropriate for students with disabilities. If required, arrangements may be made for a student to have an individual tutorial each week.

Mathematica, Minitab and SPSS

The University operates a site license for the computer algebra system *Mathematica*. This software permits the integration of symbolic, graphical and numerical computation with a modern programming environment. It is ideally suited to teaching and research in any mathematically based area of interest. The system is used in many of the subjects offered by the Department of Mathematical Sciences.

The statistical software packages, *Minitab* and *SPSS* are used in statistical subjects taught around the University. Students who have difficulty using these packages can enrol in one of the Mathematics Study Centre subjects.

Contact details

For further information students should contact:

Director, Mathematics Study Centre
Leigh Wood
telephone (02) 9514 2268
email Leigh.Wood@uts.edu.au

www.science.uts.edu.au/maths/msc.htm

Kuring-gai campus:

Judyth Hayne
telephone (02) 9514 5168
email Judyth.Hayne@uts.edu.au

Jane Ewing
telephone (02) 9514 5168
email Jane.Ewing@uts.edu.au

Physics Learning Centre

The Applied Physics Department operates a drop-in Physics Learning Centre on level 11 of the Tower Building on the City campus. Academic staff members are available at convenient times during the week to assist students with any problems they have associated with their first-year physics studies. In addition to the fixed schedule for personal tutorial assistance, there is a computer laboratory adjoining the Physics Learning Centre in which assistance can be obtained whenever the Physics Laboratory Office is open (normally 9.00 a.m. – 5.30 p.m.). There are also computer-aided learning programs and simulated textbook problems available for study by all first-year physics students. For further information contact:

Associate Professor Peter Logan
telephone (02) 9514 2194
fax (02) 9514 2219
email Peter.Logan@uts.edu.au

www.science.uts.edu.au/physics/plc.html

Bridging Courses

Chemistry Bridging Course

For first-year Chemistry subjects in 2003 it is strongly recommended that students have either HSC chemistry or some other suitable prior knowledge.

UTS Bridging Chemistry is a bridging course designed to introduce students to the language, symbols, and basic concepts on which to build a meaningful study of chemistry at the tertiary level. The format of the course includes lectures and demonstrations, tutorial and problem sessions, self-paced learning, and laboratory experiences. Students in Science enrol for two weeks in February, and are supported by comprehensive learning materials. Further information can be obtained from:

Dr John Kalman
UTS Bridging Chemistry
Department of Chemistry Materials and Forensic Science
telephone (02) 9514 1728
email John.Kalman@uts.edu.au

Rosemary Ward
telephone (02) 9514 1729
fax (02) 9514 1460
email Rosemary.Ward@uts.edu.au

Mathematics Bridging Courses

The Mathematics Study Centre provides bridging subjects for students who need mathematics, statistics and basic computing skills for their degree studies at UTS. If groups of students have particular needs, Centre staff can design a bridging subject specifically to meet these needs.

94450
Introduction to Statistics

This subject is run over four evenings in February and July. It is designed for students about to enter introductory statistics or research methods subjects. We cover statistical concepts and statistical computing, usually *SPSS*. Students also use Excel if they require knowledge of Excel for their studies. This subject is free of HECS charges and carries no credit-point value.

94470
Introduction to Computers for Beginners

This subject is usually run on Saturdays in February and March for new students and at other times if requested by faculties or student groups. It is designed for students who are not familiar with computers and aims to develop confidence, an understanding of terminology and some basic skills. It covers Microsoft Word, Excel, PowerPoint, how to use UTS systems and the Internet. This subject is free of HECS charges and carries no credit-point value.

94480
Bridging Mathematics

This intensive subject is run day and evening over two weeks in February and July. It provides prerequisite mathematical skills at 2/3-unit HSC level and is aimed at mature-age students, students who have studied mathematics overseas and students who have not studied a high enough level of mathematics at school for their needs. It is recommended for students entering Business, Engineering, Science, Design, Architecture and Building and Information Technology. This subject is free of HECS charges and carries no credit-point value.

94490
Mathematics Preparation for Nursing

This subject is run day and evening in February. It gives a general introduction to mathematics and science for students entering Nursing. This subject is free of HECS charges and carries no credit-point value.

Insearch Limited – Foundation Program

Insearch Limited, which is wholly owned by UTS, offers a Foundation Studies Certificate in Science. The program is designed by staff of the Faculty of Science for students that are not currently qualified for direct university entry. While the University cannot guarantee admission to its degree programs (for local students), students who have completed the program may apply for admission to the first year of most science degree programs offered by the Faculty. For further information contact:

The Registrar
Insearch Limited
Ground Floor
10 Quay Street
Haymarket
telephone (02) 9281 8688
fax (02) 9281 9875
email courses@insearch.edu.au

www.insearch.edu.au

Mathematics Study Centre Foundation Course

35010
Foundation Mathematics

Foundation Mathematics runs in Spring semester on two nights per week. The course covers the content of the HSC 2-unit mathematics course and prepares students for entry into courses that require some mathematical skills, such as Engineering, Science, Information Technology, Design, Architecture and Building and Business. Students who wish to enrol at the University in the following year are encouraged to take the subject as a non-award subject. In many cases the subject can then be credited as an elective in their degree program.

Students completing this course have had success in gaining entry to university and in completing their degree studies.

Physics Bridging Course

The Physics Bridging course is for students that have not completed HSC Physics and intend to undertake a tertiary course in which HSC Physics is recommended. Additionally, this course is recommended for students returning to study after a long time.

UTS Bridging Physics is a short introductory and refresher course in Physics suitable for all students entering courses with a Physics component. The course does not attempt to cover all of HSC Physics, however, it does provides the necessary knowledge to assist with tertiary study.

The format of the course includes lectures and problem solving tutorials. The two-day course is held late in January, and is supported by comprehensive learning materials. Further information can be obtained from:

Associate Professor Peter Logan
telephone (02) 9514 2194
fax (02) 9514 2219
email Peter.Logan@uts.edu.au

www.science.uts.edu.au/physics/plc.html

PRIZES AND SCHOLARSHIPS

Prizes and scholarships are awarded each year to students in the Faculty for meritorious work. These are made available through the generosity of private individuals and public organisations. They are offered each semester, annually or biennially. In rare instances, a prize or scholarship is offered only when funds permit. Most prizes and scholarships are offered subject to the provision that they will be awarded only when a student has attained a mark or level of achievement considered by the Faculty Board to be sufficiently high. In addition to these official University prizes and scholarships, it should be noted that there are available a number of prizes and scholarships from external sources for which University students can compete. Information about these prizes and scholarships appears from time to time on official noticeboards. Students should note that the conditions of the awards listed in this handbook are being reviewed and may be subject to change.

University medals

Students who meet the minimum requirement for the award of a University Medal are considered by the Faculty Medals Committee. According to University policy, the number of medals awarded in any one year by the Faculty is limited.

Dean's Merit List for Academic Excellence

The Faculty wishes to formally recognise outstanding performance by its students through the awarding of prizes, medals and the grading of degrees. The Dean's Merit List endeavours to formally acknowledge academic achievement throughout a student's course of study. The Faculty publishes a list of students who have been placed on the Dean's Merit List. Each student also receives a certificate to this effect. To be listed, a student usually needs to undertake a normal load, achieve an average mark for the year of 85 per cent or above and be recommended by the relevant Examination Review Committee in December each year.

3M Australia Prize

This prize is awarded annually to the student who obtains the highest aggregate mark in the subject 65410 Chemical Safety and Legislation. The Prize is in the form of a suitably worded certificate together with a cash prize of $250

Australasian Association of Clinical Biochemists (NSW/ACT Branch) Prize

This prize was established in 1995 by the NSW/ACT Branch of the Australasian Association of Clinical Biochemists, initially for students in a postgraduate course. It is now offered annually to the student in an undergraduate course in the Faculty of Science who has gained the highest weighted average mark in the subjects 91313 Biochemistry 1, 91320 Biochemistry 2, 91326 Analytical Biochemistry, 91344 Medical and Diagnostic Biochemistry and 91345 Biochemistry, Genes and Disease, provided that the weighted average mark is not less than 70 per cent. The prize consists of a suitably inscribed plaque, a cash award of $200 and one year's membership of the Australasian Association of Clinical Biochemists.

The Australian Acupuncture and Chinese Medicine Association Prize

This prize is awarded to the graduating student from the Bachelor of Health Science in Traditional Chinese Medicine course who obtains the highest weighted average mark for all subjects in the course. The prize is in the form of a suitably worded certificate, together with a book allowance to the value of $250, plus one year's complimentary membership of the Australian Acupuncture Association Limited.

The Australian Ceramic Society Award

The Australian Ceramic Society Award was established in 1986 and is awarded annually to the student enrolled in the Materials Science degree course who, when undertaking a research project in the area of ceramics, obtains the highest average mark in Stages 1, 2, 3 and 4. The cash value of the award is $400.

Australian Institute of Medical Scientists' Prize in Clinical Bacteriology

This prize was established in 1983 by the New South Wales Branch of the Australian Institute of Medical Laboratory Scientists. It is offered annually to students enrolled in the Biomedical Science course who take the AIMS Accredited Program of Study, and is awarded to the student who obtains the highest mark in the subject 91338 Clinical Bacteriology. The prize consists of a cash award of $250 and a one year's subscription to Path Report.

Australian Institute of Medical Scientists' Prize in Haematology

This prize was established in 1983 by the New South Wales Branch of the Australian Institute of Medical Laboratory Scientists. It is offered annually to students enrolled in the Biomedical Science course who take the AIMS Accredited Program of Study and is awarded to the student who obtains the highest mark in the subject 91358 Haematology 2. The prize consists of a cash award of $ 250 and a one year's subscription to Path Report.

Australian Institute of Physics Prize

The NSW Branch of the Australian Institute of Physics has made available an annual award to a student in the fourth year of the Physics degree who obtains the best results in completing the final stage of the course. The prize is a cash award of $200 plus one year's free membership of the Australian Institute of Physics.

Australian Society for Parasitology Prize

This prize was established in 2001 and is awarded to the student enrolled in an undergraduate degree at the University who achieves the highest mark for the subject 91352 Parasitology, provided that the grade obtained is not lower than Distinction. The prize is in the form of a suitably worded certificate and a cash award of $400.

Biotechnology Prize

This prize was established in 2000 by Dr Ian Stevenson, former Course Director of the Biotechnology degree, and is awarded annually to the graduating student from the Biotechnology degree courses offered by the University who achieves the highest weighted average mark in 91314 General Microbiology, 91330 Epidemiology and Public Health Microbiology and 91369 Biobusiness and Environmental Biotechnology, provided that the weighted average mark is at Distinction level or higher. The prize consists of a suitably worded certificate and a cash award of $250.

Cathay Herbal Laboratories Prize

This prize is awarded annually to the graduating student from the Bachelor of Health Science in Traditional Chinese Medicine course who obtains the highest aggregate mark in the final-year clinical subjects. The prize is in the form of a suitably worded certificate, together with Cathay Herbal

Laboratories products such as textbooks, acupuncture supplies, herbal medicines and educational services, to the value of $1,000.

Chemistry Department Prize

This prize was established in 1986. It is awarded annually to the student enrolled in the Applied Chemistry degree course who, having completed Stage 2 of the course, obtains the best performance in the Stage 2 chemistry subjects. The prize is valued at $250.

CIBA Specialty Chemicals – Industrial Training Scholarship

The purpose of this scholarship is to allow students currently undertaking the Diploma of Scientific Practice to obtain full-time training at CIBA Specialty Chemicals for up to 12 months. The scholarship is valued at $20,000 and is available from time to time.

Colin Field Prize

This prize was established in 1989 by Emeritus Professor Colin Field, former Dean of the Faculty of Life Sciences and Head of the School of Biological and Biomedical Sciences. The prize is awarded annually to the Biomedical Science, Environmental Biology or Biotechnology student who obtains the highest overall average mark from all subjects undertaken in Stages 1 and 2. The prize has a cash value of $250.

CSL (Commonwealth Serum Laboratories) Prize

This prize was established in 1990. It is awarded to the graduating student from the Faculty of Science who attains the highest aggregate mark in the subject 91340 Transfusion Science, with a mark at Distinction level or higher. The prize has a cash value of $250.

Department of Land and Water Conservation Prize

This prize was first established as the Department of Water Resources Prize in 1990. It is awarded annually to the student enrolled in the Biological and Biomedical Sciences courses who obtains the highest average mark in the subjects 91121 Aquatic Ecology, 91119 Terrestrial Ecosystems, and 91120 Mapping and Remote Sensing, provided that the average mark is of Distinction grade. The prize has a cash value of $250.

DFC Thompson Memorial Prize

This prize is awarded annually to the student who, upon completion of Stage 5 in the Applied Chemistry degree course, obtains the highest weighted average mark for subjects in Stages 3, 4 and 5 of the course. The prize consists of a suitably worded certificate, together with a cash prize of $1,000.

The Environmental Biology Prize

This prize was established anonymously in 1984. The prize has a cash value of $250 and is awarded to the student enrolled in the Bachelor of Science in Environmental Biology degree course who obtains the highest average mark in Stages 3 to 6 of the degree course.

Foseco Prize in Materials Science

This prize was established in 1982 by Foseco Pty Ltd as an incentive to students engaged in studies in the field of Materials Science. The prize is offered annually to students enrolled in the Materials Science degree course and is awarded to the student who achieves the highest aggregate mark in the subject 67407 Physical Properties of Materials. The prize consists of a cash award of $200.

Foundation for Australian Resources Prizes

The Foundation for Australian Resources is an independent nonprofit organisation whose nominated beneficiary is the Faculty of Science. The Foundation has made available three prizes to students enrolled in courses run by the Department of Mathematical Sciences. One prize, valued at $250, is for the best graduating student from the Bachelor of Science (Honours) in Mathematics degree. The other two, valued at $100 each, are awarded to the outstanding first-year, full-time student enrolled in either the Bachelor of Science in Mathematics or the Bachelor of Mathematics and Finance program, and to the outstanding part-time student enrolled in Stage 1 of either of these programs.

Francis E Feledy Memorial Prize

This award was established by the staff of the British Motor Corporation as a memorial to the late Francis E Feledy for his work as an architect and engineer with that company. The award was first made available in 1966 through the then Department of Technical Education. In 1974, the then Institute became the Trustee of the fund. At the discretion of the Trustee, the prize is awarded annually to an outstanding part-time student entering his/her final year in each of the Faculties of Engineering; Science; and Design, Architecture and Building. Each prize is valued at $600.

Hampson Sugerman Macquarie Prize in Biomedical Science

This prize was established in 1984 by Macquarie Pathology Services Pty Ltd. It is awarded annually to the student who obtains the highest average mark in Stages 3–6 of the degree course leading to the award of Bachelor of Science in Biomedical Science. The prize includes a cash award of $375 and a medal.

Hampson Sugerman Macquarie Prize in Pathology

This prize was established in 1982 by Dr David Sugerman. The prize is awarded annually to the student enrolled in the Biomedical Science degree course who obtains the highest aggregate in the subjects 91354 Anatomical Pathology, 91351 Immunology 1 and 91355 Haematology 1, provided that the student reaching the highest aggregate has an average mark of not less than the standard of Credit. The prize consists of a cash award of $375 and a medal.

Hatrick-Jotun Prize

This prize (formerly the Hatrick Fiberfil Prize in Design and Materials Selection) was re-established in 1986. It is awarded to the student in the Materials Science degree course who achieves the best performance in the subject 67608 Composites. The prize has a cash value of $250.

Hatrick Reichhold Prize in Polymer Technology

This prize was established in 1984 by A C Hatrick Chemicals Pty Ltd as an incentive to students studying in the field of polymers and resin technology. The prize is awarded to the student who achieves the best performance in the subject 67409 Polymer Technology. The cash value of the prize is $250.

Helio Supply Co. Prize

This prize is awarded to the graduating student from the Bachelor of Health Science in Traditional Chinese Medicine course who obtains the highest weighted average mark for Traditional Chinese Medicine subjects in the final year. The prize is in the form of a suitably worded certificate, together with a cash prize of $250 and a $250 credit account with Helio Supply Co.

The Institute of Materials Engineering Australasia Prize

This prize, established in 1983, is offered annually to students in the Materials Science degree course, and is awarded to the student who achieves the highest mark in the subject 67304 Physical Metallurgy. The prize consists of a cash award of $200 and one year's membership of the Institute of Materials Engineering Australasia.

Leonard J Lawler Prize

This prize is presented by the Australian Institute of Medical Scientists (AIMS) in dedication to the past services of Leonard J Lawler to the New South Wales Branch of the AIMS. Over a long period Mr Lawler has shown great interest in the education of clinical chemists. The prize has been awarded annually since 1976. It is awarded to the student enrolled in the Biomedical Science course who attains the best aggregate in the subjects 91344 Medical and Diagnostic Biochemistry and 91345 Biochemistry, Genes and Disease. The prize consists of a cash award of $250 and a one year's subscription to Path Report.

Loctite Australia Prize in Adhesion Science

This prize was established in 1983. It is awarded annually to the student enrolled in the Materials Science degree course who achieves the best performance in the subject 67508 Surface Chemistry of Materials. The prize has a cash value of $150.

M Y Ali Prize in Cytopathology (previously known as M Y Ali Prize in Diagnostic Cytology)

This prize was established in 1978 by Dr M Y Ali, former Associate Head of the School of Life Sciences at NSWIT, who was responsible for the introduction and initial development of studies in diagnostic cytology. It is awarded annually to the student enrolled in the Biomedical Science degree course who achieves the highest mark in the subject 91130 Cytopathology Part A and 91131 Cytopathology Part B, provided that the mark is not less than Credit level. The prize consists of a cash award of $200 and a suitably worded certificate.

The New South Wales Police Service Prize

This prize was established in 1997 by the New South Wales Police Service Education and Training Command. It is awarded to the student enrolled in the Bachelor of Science (Honours) in Applied Chemistry – Forensic Science who obtains the highest weighted average mark for the Forensic Examination of Physical Evidence subjects. The prize consists of a suitably worded certificate together with a cash award of $500.

Pasminco Prize in Extractive Metallurgy

This prize was established in 1990. It is awarded to the student enrolled in the Physical Sciences courses who obtains the highest aggregate mark in the subject 65062 Extractive Metallurgy. The prize has a cash value of $250.

Pfizer Achievement Award

This prize was established in 1997 by Pfizer Pty Ltd. It is awarded to the student enrolled in either the Applied Chemistry degree course or the Bachelor of Science (Honours) in Applied Chemistry – Forensic Science course who achieves the highest mark in the subject 65508 Organic Chemistry 2 (Structure, Elucidation and Synthesis), provided that the grade obtained is not lower than Distinction. The prize has a cash value of $1,000.

Physics Staff Prize

This prize was established in 1985. It is awarded each year to the student in the Applied Physics degree course who obtains the highest average mark in Stages 1–3 of the course. The prize has a cash value of $250.

RACI Industrial Chemistry Group Prize for Environmental Chemistry

This prize, established in 2001, is awarded to the student enrolled in an undergraduate degree at the University who achieves the highest mark for the subject 65621 Environmental Chemistry, provided that the grade obtained is not lower than Distinction. The prize is in the form of a suitably worded certificate and a cash award of $500.

R F G MacMillan Award

This prize was established in 1991. It is awarded to a Materials Science degree student for participation and involvement in Materials Science activities beyond the normal academic requirements. The prize has a cash value of $500.

Robert K Murphy Research Fund

To perpetuate the name of Dr R K Murphy, who was for 25 years Lecturer-in-Charge of the Chemistry Department and subsequently Principal of Sydney Technical College, the Sydney Technical College Science Association sponsored a fund to be known as the Robert K Murphy Research Fund, to which a number of chemical industries also subscribed. The income from the fund has been applied to set up the following prizes and a scholarship:

1. Robert K Murphy Research Prize

This prize is awarded annually to the student in the Applied Chemistry degree course who submits the best original chemistry project. The prize has a cash value of $250.

2. Robert K Murphy Prize

This prize is awarded annually to the student in the Applied Chemistry degree course who entered the course on completion of Chemistry Certificate of the TAFE Commission and who achieves the best overall performance in the Applied Chemistry degree. The prize has a cash value of $250.

3. Robert K Murphy Research Scholarship

This scholarship is awarded annually to the student in the Applied Chemistry degree course who satisfies the Trustees that such a scholarship is warranted to assist the student in research, investigation or advanced study. The prize has a cash value of $250.

Safety Institute of Australia Ratcliffe Prize

Awarded for the best aggregate result of the Master of Occupational Health and Safety Management course. This prize has a cash value of $250.

Sam Huxham Memorial Prize

This prize was established in 1994 in memory of Samuel Hugh Huxham, who joined the NSW Institute of Technology in 1971 and was Head of the Statistics and Operations Research Unit at the time of his death in May 1994. It is awarded each year for the best performance in the Statistics major by a student completing the Bachelor of Science in Mathematics degree in the preceding year. The prize has a cash value of $250.

Schering Plough Prize

This prize was established in 1990. It is awarded to the student enrolled in an Advanced Chemistry project in the Applied Chemistry course who presents the best project seminar (in terms of both technical merit and presentation). The prize has a cash value of $250.

St Joe Mineral Deposits Prize

St Joe Australia Pty Ltd established this prize in 1984. The prize is awarded to the student who obtains the highest mark in the subject 66408 Earth Resources. The prize has a cash value of $50.

Stanton Coalstad Prize

This prize is awarded annually to the student who obtains the highest mark in the subject 67101 Introduction to Materials at his or her first attempt. The prize is valued at $500 and comprises a cash award and a book voucher.

Sydney Environmental and Soil Laboratory Prize in Urban Horticulture

This prize is awarded to the graduating student from the Bachelor of Science in Environmental and Urban Horticulture course who obtains the highest weighted average mark in Stages 3–6 of the course, at Credit level or above. The prize is in the form of a suitably worded certificate, together with a cash prize of $300.

Western Mining Corporation Prize

This prize was established in 1986. It is awarded annually to the student enrolled in the Bachelor of Science in Earth and Environmental Science course who obtains the highest average mark of all students undertaking the Field Project in the year for which the award is made. The successful student will preferably demonstrate an interest in metalliferous exploration geology. The prize has a cash value of $200.

Western Mining Corporation Junior Studies Prize

This is a cash prize of $150 awarded annually to the student who has shown the most significant improvement in the quality of academic work at the completion of Stage 4 in the Materials Science degree course. The prize was awarded for the first time in 1979.

Western Mining Corporation Senior Studies Prize

This is a cash prize of $150 awarded annually, subject to a suitable recipient being nominated by the Head of the Department of Chemistry, Materials and Forensic Science, for distinguished performance in the final year (Stages 5 and 6) of the Materials Science degree course. The prize was awarded for the first time in 1979.

Workcover Authority Prize

Awarded for the highest aggregate mark in the first year of study in the Master of Occupational Health and Safety Management course, this prize is in the form of a suitably worded certificate, together with a cash prize of $500.

Yakult Student Award in Biotechnology

This prize was established in 1996. It is awarded to the graduating student in the Biotechnology degree courses offered by the university who obtains the highest weighted average mark for the specialist biotechnology subjects 91368 Bioreactors and Bioprocessing and 91369 Biobusiness and Environmental Biotechnology, provided that the average mark is at Credit level or higher. The prize is valued at $250.

Faculty of Science Doctoral Research scholarships

A number of Doctoral Research scholarships may be offered to permanent residents by the Faculty for full-time study towards a PhD. The awards which may be up to the value of approximately $17,000 per annum over three years are available for study in the following areas:

- Analytical and Organic Chemistry
- Applied Physics including Image Processing and Analysis
- Cell and Molecular Biology
- Ecotoxicology and Horticulture
- Environmental Sciences including Environmental Biology and Earth Science
- Forensic Science
- Groundwater Management
- Health Science and Health Science Technology

- Materials Science and Technology
- Mathematics
- Medical and Biomedical Science
- Quantitative Finance
- Statistics.

Other scholarships for special purposes, including industrial training, are offered from time to time. Information and application forms can be obtained from the Office of the Associate Dean (Research). The closing date is normally the end of October in the year prior to award.

For further information on prizes and scholarships administered by the Faculty of Science contact (02) 9514 1756.

INTERNATIONAL STUDIES ELECTIVES

The Institute for International Studies at UTS offers electives in language studies and in the study of contemporary societies in parts of the non-English-speaking world. All subjects are taught over one semester and have a value of 8 credit points.

Language Studies

The Institute for International Studies organises and coordinates the teaching of languages other than English to all UTS students. All students intending to take language studies as part of their degree need to enrol through the Institute, even if the language concerned is not taught on UTS campuses. With the permission of their faculty, students may study languages other than English as electives in any UTS degree.

The Institute is offering Language programs in Chinese, French, German, Italian, Japanese and Spanish on UTS campuses through arrangements with the Insearch Language Centre. Greek, Indonesian, Malaysian, Russian and Thai are offered to UTS students through arrangements that have been made with other universities.

In addition, it is always possible for individual arrangements to be made to enable UTS students to study at higher levels than those offered at UTS or to study additional languages depending on availability.

In all cases, classes are only taught at UTS if student numbers permit. In some cases, students may need to travel to other campuses in the Sydney area.

Students intending to take International Studies subjects as electives are advised to contact the Institute at the earliest opportunity.

Further information is available in the 2003 handbook for the Institute for International Studies, or by contacting the Institute for International Studies on telephone (02) 9514 1574.

Contemporary Society

The Institute also offers a series of subjects that provides an introduction to the contemporary societies, politics, economics and culture of China, Japan and the countries of South-East Asia, Latin America and Europe that are the areas of specialisation of the Institute.

There are no prerequisites for any of the Contemporary Society subjects. All subjects are taught in English and are available, with the permission of their faculties, to all UTS students. Further information is available in the 2003 handbook for the Institute for International Studies, or by contacting the Institute for International studies on telephone (02) 9514 1574.

UNDERGRADUATE COURSES

PASS DEGREE COURSES

Continuing students

All students who commenced before 1997 should refer to the 1998 handbook for the Faculty of Science for old course and subject descriptions and transitional arrangements.

Printed copies of the 1998 handbook for the Faculty of Science are available for viewing in all Department offices and from the Faculty Offices at the St Leonards and City campuses.

Admission requirements

Applicants are considered for admission in accordance with the Rules and By-law of UTS as set out in the *UTS: Calendar*, and on the basis of meeting the general requirements in one of the following categories:

- the NSW Higher School Certificate
- an appropriate TAFE award – Diploma, Associate Diploma or completion of a Tertiary Preparation Course (TPC)
- equivalent qualifications
- mature age or non-recent school leavers (see *UTS: Calendar* for details)
- accumulated matriculation (see *UTS: Calendar* for special circumstances).

Assumed knowledge / course prerequisites

There are no mandatory prerequisite subjects from the Higher School Certificate. However, it is assumed that all students entering the medical, biomedical and biotechnological sciences courses have studied at least any two units of English, any two units of mathematics plus any two units of science. It is strongly recommended that they complete studies in two science subjects. Common combinations include chemistry/physics or chemistry/biology. For students entering programs in Applied Chemistry, Applied Physics, Forensic Science, and Environmental Biology, Nanotechnology and Mathematics it is assumed that they have studied at least any two units of English, two-unit mathematics plus two-unit physics, or two-unit chemistry or three-/four-unit science. For students entering the Traditional Chinese Medicine program it is assumed that they have studied at least any two units of English, and any two units of mathematics or science. The minimum University Admissions Index (UAI) varies from year to year depending on the number of applications for entry and the number of places available. For students entering the Traditional Chinese Medicine program it is assumed that they have studied at least any two units of English, and mathematics or science.

Requirements for award of Bachelor's degree

A degree is awarded to students who complete satisfactorily the following requirements:

1. Credit points[1]

A minimum of 144 credit points, accumulated by:

- full-time attendance in Bachelor's degree courses involving satisfactory completion of the prescribed core subjects and other approved subjects to the value of 48 credit points for each of three years, or
- part-time attendance in Bachelor's degree courses involving satisfactory completion of the prescribed core subjects and other approved subjects to the value of 24 credit points for each of six years, or
- any other approved combination of full-time and part-time attendance.

Students who have failed subjects cannot be guaranteed a complete program or normal progression. However, in some courses a subject failed with a mark of 40 per cent or more may allow progression into subjects for which the failed subject is a prerequisite. All prescribed subjects must be successfully completed for award of a degree.

Students having difficulty devising a program should contact the Student Administrative

[1] Attendance patterns: the terms 'full-time' and 'part time' refer to the number of credit points being undertaken and do not imply attendance at any particular time of day. The Faculty of Science normally schedules classes between 9.00 a.m. and 10.00 p.m., and students may be required to attend any scheduled class regardless of their attendance pattern. It is unavoidable that full-time students will be required to attend some evening classes and that part-time students will be required to attend some daytime classes.

Officer or an academic adviser. Contact details of all course directors are listed at the end of the entry for each course. Where a student experiences legitimate difficulty enrolling in sufficient credit points to make up a full-time load, a minimum of 75 per cent of a normal full-time program is deemed adequate to maintain designation as a full-time student provided the whole degree is completed within 150 per cent of the normal progression period. Thus, a three-year full-time degree should be completed in or under four-and-a-half years. Similarly, there is no minimum number of credit points for a part-time program for any one semester, but the whole degree should be completed within 150 per cent of the normal progression period, i.e. a six-year, part-time degree should be completed in or under nine years.

2. Professional / industrial experience

Students enrolled in science courses have the option to undertake industrial training or other relevant professional experience additional to the normal academic requirements of their course. In most cases this involves spending up to 12 months working in a relevant industry. This experience is normally gained prior to completing the academic requirements of the course and earns the student extra academic credit which is recognised by the award of a Diploma in Scientific Practice. Further details appear below.

General structure of the Bachelor of Science, Bachelor of Biotechnology, Bachelor of Medical Science and Bachelor of Mathematics degrees.

In 1997, the structures of all undergraduate courses, with the exception of the Bachelor of Health Science courses, were extensively revised with the aim of increasing the study options available to students. As a result, the general structure of these courses now comprises four components:

1. a **core discipline (major) strand** (approximately 72 credit points) consisting of the prescribed subjects that define the course and form the basis for professional recognition
2. a variable number of prescribed **core support** subjects (normally 24–36 credit points in Stages 1–3) which underpin the core discipline strand though may not contribute directly to the requirements for professional recognition
3. a **second major** component (normally 24 credit points) comprising a coherent set of non-prescribed subjects offered by the Faculty of Science, another faculty of the University or the Institute for International Studies
4. **free elective** subjects (12–24 credit points), selected from anywhere in the University or cross-institutionally.

Details of recommended science strands (see page 143) and second majors (see page 146) offered by the Faculty of Science and other parts of the University are given at the end of the Undergraduate Courses section of this handbook.

Graduate Diploma in Education

Overview

The Graduate Diplom in Education offers a science education program and is intended to prepare students for a career in secondary school science education. In addition to a Bachelor of Science, Bachelor of Biotechnology or Bachelor of Medical Science program, students complete the Graduate Diploma in Education, which consists of two semesters of study.

Admission requirements

Students enrolled in a Bachelor of Science, Bachelor of Biotechnology or Bachelor of Medical Science program may apply to enter the Graduate Diploma in Education after the completion of at least 96 credit points of study. The selection process includes a formal interview. Students who seek to enter the Graduate Diploma in Education before the completion of the Bachelor program are normally expected to have obtained a Credit average in the core science subjects.

Course structure

Students complete two semesters of studies in Education, not necessarily in the same year. The Graduate Diploma is not awarded until the completion of the Bachelor of Science or Bachelor of Medical Science program.

Other information

For further information contact:

Office of the Associate Dean
(Teaching and Learning)
Faculty of Science
telephone (02) 9514 4044
fax (02) 9514 4095

Diploma in Scientific Practice

- UTS course code: C20038 (pre-2003: N005)
- Testamur title: Diploma in Scientific Practice
- Abbreviation: DipScPrac
- Course Director: Associate Professor Rod Buckney
- Course fee: HECS (local)[1]
- Total credit points: 48

Overview

The Faculty of Science offers a Diploma in Scientific Practice, which can be taken in combination with any Science, Biotechnology or Medical Science course. The Diploma study consists of a minimum of 30 weeks of Industrial Training and two 6-credit-point subjects. Students undergo workplace assessment and must also pass both subjects to graduate with the combined Bachelor of Science/Biotechnology/Medical Science, Diploma in Scientific Practice. The combined program is designed to ensure that graduates have enhanced practical skills and a mature understanding of the workplace environment.

Admission requirements

Students enrolled in a Bachelor of Science, Bachelor of Biotechnology or Bachelor of Medical Science program may apply to enter the combined program after completion of at least 48 credit points of study; in some programs a later entry is recommended. Places are not guaranteed because industrial training providers are not necessarily in a position to offer places in any one year.

Course program

The following general pattern is followed, though students in particular Bachelor courses may undertake the Diploma components at a different stage or sequence.

Full-time program

Year 1

Autumn semester		
xxxxx	Bachelor program subjects	24cp
Spring semester		
xxxxx	Bachelor program subjects	24cp

1 This course is not offered to international students.

Year 2

Autumn semester

xxxxx	Bachelor program subjects	24cp

Spring semester

xxxxx	Bachelor program subjects	24cp

Year 3

Autumn semester

xxxxx	Industrial Training	0cp
60811	Professional Scientific Practice A	6cp

Spring semester

xxxxx	Industrial Training	0cp
60812	Professional Scientific Practice B	6cp

Year 4

Autumn semester

xxxxx	Bachelor program subjects	24cp

Spring semester

xxxxx	Bachelor program subjects	24cp

Students enrolled in the combined program will normally complete the Bachelor program after the Scientific Practice subjects are completed, though there may be circumstances with part-time students, where concurrent completion would occur.

Other information

For further information contact:

Office of the Associate Dean
(Teaching and Learning)
Faculty of Science
telephone (02) 9514 4044
fax (02) 9514 4095

Bachelor of Science

- UTS course code: C10166 (pre-2003: N010)
- UAC code: 607011
- Testamur title: Bachelor of Science
- Abbreviation: BSc
- Course Director: Associate Professor Rod Buckney
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

This course is designed for future scientists wanting to develop skills and knowledge in a range of scientific disciplines. Students enrol in introductory subjects in many areas of science and may later focus on a specific area of interest. This program is flexible enough to allow students to nominate their own first-year subjects if they so wish and guidance is provided to assist in this process. Students are encouraged to undertake a professional/ industrial experience program that leads to the award of the Diploma in Scientific Practice[1]. Study for the Diploma consists of a minimum of 30 weeks industrial training and two 6-credit-point subjects. For further information see separate entry for the Diploma in Scientific Practice on page 56 of this handbook.

1 The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional scientists with highly adaptable and practical scientific and field skills, accompanied by a thorough grounding in theory. Graduates can expect to find employment in a range of areas depending on their chosen specialisations. Graduates can expect to work in positions such as scientific officers with government agencies such as: the CSIRO; Environment Protection Authority; Sydney Water; Department of Urban Affairs and Planning; Department of Land and Water Conservation; Department of Fisheries; National Parks and Wildlife Service; and museums and herbaria. They may also work with local government authorities; as technical and research officers with universities and colleges; or as biotechnologists, communications specialists, pathologists and laboratory scientists or biological scientists in private enterprise.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International Students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English Language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, they may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

Students can complete the course in:

- three years, full time
- six years, part time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

Subjects currently offered by the University have been classified as Introductory (normally taken in Stages 1 and 2), Intermediate (Stages 3 and 4) and Advanced (Stages 5 and 6 or later). In the Bachelor of Science, a student completes:

- a minimum of 12 credit points of Mathematics/Statistics and Computing subjects, normally in their first year
- at least 96 credit points of Science subjects, of which 24 credit points must be at Advanced level, and
- at least an additional 12 credit points of Advanced level subjects from any area.

The Faculty recommends that students choose from one of four Introductory level programs, depending on whether their areas of specialisation lie in the Physical Sciences (Physics, Chemistry, Materials Technology, Forensic Chemistry, Nanotechnology and related areas), Environmental Sciences (Biology, Earth Sciences), Medical and Biomedical (Medical and Medical Laboratory Science, Biotechnology, Forensic Biology) or Computational Science (Mathematics).

The above structure is recommended, rather than prescriptive. Students with sound academic reasons for choosing other pathways to the award of the Bachelor of Science should contact the Associate Dean (Teaching and Learning). Provided that the above constraints are met and a student's proposed program can be timetabled, approval will be granted for variation from the above 'typical' structure. Part-time students can take subjects at about half the rate specified above.

Students are advised to think carefully about their choice of Advanced subjects during their first year of study. The prerequisites of Advanced-stage subjects are generally at a much higher level than basic stage subjects. Consequently, Advanced-stage subjects effectively define Intermediate stage subjects which students will need. Students who meet, or anticipate, prerequisite 'blockages' should consult with the Associate Dean (Teaching and Learning) or other academic staff to identify areas of assumed knowledge that the prerequisite subjects provide.

Course program

A typical full-time program that includes the minimum science component is shown below:

Physical Sciences

Stage 1

65101	Chemistry 1C	6cp
68101	Foundations of Physics	6cp
67101	Introduction to Materials	6cp
33190	Mathematical Modelling for Science	6cp

Stage 2

65201	Chemistry 2C	6cp
68201	Physics in Action (Physics 2)	6cp
67303	Mechanical Properties of Materials	6cp
33290	Computing and Mathematics for Science	6cp

Environmental Sciences

Stage 1

33116	Statistical Design and Analysis	6cp
91101	Cells, Genetics and Evolution	6cp
65012	Chemistry 1A	6cp
66101	Earth Science 1	6cp
	or	
91246	Plant Structure, Function and Culture	6cp
	or	
xxxxx	Other approved subject	6cp

Stage 2

33101	Mathematics 1 (Life Sciences)	3cp
91395	Biocomputing	3cp
91102	Functional Biology	6cp
65022	Chemistry 2A	6cp
66204	Field Studies 1	6cp
	or	
91247	Landscape Design and Plant Culture	6cp
	or	
xxxxx	Other approved subject	6cp

Medical and Biosciences

Stage 1

33116	Statistical Design and Analysis	6cp
91701	Medical Science 1	6cp
91101	Cells, Genetics and Evolution	6cp
65012	Chemistry 1A	6cp

Stage 2

91313	Biochemistry 1	6cp
91702	Medical Science 2	6cp
65022	Chemistry 2A	6cp
68041	Physical Aspects of Nature	6cp

Computational Science

Stage 1

35101	Mathematics 1	6cp
35170	Introduction to Computing	6cp
68101	Foundations of Physics	6cp
xxxxx	Elective	6cp

Stage 2

35102	Mathematics 2	6 cp
68xxx	Introduction to Computational Science	6 cp
68201	Physics in Action (Physics 2)	6 cp
xxxxx	Elective	6 cp

Generic: Stages 3–6

Stage 3

xxxxx	Science specialisation subjects	12cp
xxxxx	Electives[1]	12cp

Stage 4

xxxxx	Science specialisation subjects	12cp
xxxxx	Electives[1]	12cp

Stage 5

xxxxx	Science specialisation subjects	12cp
xxxxx	Electives[1, 2]	12cp

Stage 6

xxxxx	Science specialisation subjects	12cp
xxxxx	Electives[1, 2]	12cp

1 At least 12 credit points of the electives must be from the Faculty of Science.

2 At least 12 credit points of electives must be at Advanced level.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, seminar presentations and reports based on field and laboratory work. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Professional recognition

Depending on the subjects and specialisations chosen, graduates may be eligible to join the relevant professional and industry associations. Contact the Course Director for further details.

Other information

All students are encouraged to consult the Faculty website at:

www.science.uts.edu.au

All academic inquiries, including advice on subject and specialisation selection, exemptions and variations in program, should be made to:

Associate Dean (Teaching and Learning)
Associate Professor Rod Buckney
telephone (02) 9514 4044
fax (02) 9514 4095
email Rod.Buckney@uts.edu.au

Bachelor of Science in Applied Chemistry

- UTS course code: C10179 (pre-2003: NC05)
- UAC code: 607105
- Testamur title: Bachelor of Science in Applied Chemistry
- Abbreviation: BSc
- Course Director: Dr John Kalman
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

This course provides a firm foundation in the study of science, with an in-depth study in applied chemistry. Major areas of study include analytical, inorganic, organic and physical chemistry, and materials science (see Second Majors section of this handbook for more details). Minor studies or electives may be undertaken in a wide range of areas offered within the Faculty of Science or within the University. Students are strongly encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field.

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional chemists with highly adaptable and practical scientific skills, accompanied with a thorough grounding in theory. Graduates can expect to find employment in a range of industries including foods, pharmaceuticals, industrial chemicals, plastics, paints, metals and alloys, solvents, petroleum, health and environmental monitoring. Recent graduates are working in a range of positions in industry, government research laboratories and universities as research scientists, industrial chemists, environmental chemists, and scientific officers.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, Physics and Chemistry. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE. Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University during the first year (Stages 1 and 2) and about 20 hours per week in the second and third years (Stages 3–6). This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University in Stages 1–2 and approximately ten hours per week in Stages 3–6. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

Students can complete the course in:

- three years, full time
- six years, part time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

The course consists of six academic stages but may include a period of industrial training that extends the minimum completion time to four years leading to the additional award of Diploma in Scientific Practice (see page 56).

Course program

Full-time program

Stage 1

Autumn semester

33190	Mathematical Modelling for Science	6cp
65101	Chemistry 1C	6cp
67101	Introduction to Materials	6cp
	and either	
68101	Foundations of Physics[1]	6cp
	or one of	
66101	Earth Science 1	6cp
91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp

Stage 2

Spring semester

33290	Computing and Mathematics for Science	6cp
65201	Chemistry 2C	6cp
68201	Physics in Action (Physics 2)	6cp
	or	
68041	Physical Aspects of Nature[2]	6cp
	plus	
xxxxx	Approved Science subject	6cp

Stage 3

Autumn semester

65202	Organic Chemistry 1	6cp
65410	Chemical Safety and Legislation	6cp
65307	Physical Chemistry 1	6cp
xxxxx	Elective/second major	6cp

Stage 4

Spring semester

65508	Organic Chemistry 2 (Structure Elucidation and Synthesis)	6cp
65411	Inorganic Chemistry 1 (Transition Metal Chemistry)	6cp
65306	Analytical Chemistry 1	6cp
xxxxx	Elective/second major	6cp

Stage 5

Autumn semester

65409	Analytical Chemistry 2	6cp
65509	Inorganic Chemistry 2 (New Inorganic Materials)	6cp
xxxxx	Electives/second major	12cp

Stage 6

Spring semester

65606	Analytical Chemistry 3	6cp
65607	Physical Chemistry 2	6cp
xxxxx	Electives/second major	12cp

1 Strongly recommended.

2 Not available to students who have completed 68101 Physics 1C.

Note: See the list of second majors on page 146.

Part-time program

Stage 1

Autumn semester

33190	Mathematical Modelling for Science	6cp
67101	Introduction to Materials	6cp

Spring semester

65101	Chemistry 1C	6cp
68101	Foundations of Physics[1]	6cp
	or	
68041	Physical Aspects of Nature[2]	6cp

Stage 2

Autumn semester

65201	Chemistry 2C	6cp
	and either	
68201	Physics in Action (Physics 2)	6cp
	or one of	
66101	Earth Science 1	6cp
91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp

Spring semester

33290	Computing and Mathematics for Science	6cp
xxxxx	Elective/second major	6cp

Stage 3

Autumn semester

65202	Organic Chemistry 1	6cp
65410	Chemical Safety and Legislation	6cp

Spring semester

65411	Inorganic Chemistry (Transition Metal Chemistry)	16cp
65306	Analytical Chemistry 1	6cp

Stage 4

Autumn semester

65307	Physical Chemistry 1	6cp
xxxxx	Elective/second major	6cp

Spring semester

65508	Organic Chemistry 2 (Structure Elucidation and Synthesis)	6cp
xxxxx	Elective/second major	6cp

Stage 5

Autumn semester

65409	Analytical Chemistry 2	6cp
xxxxx	Elective/second major	6cp

Spring semester

65606	Analytical Chemistry 3	6cp
xxxxx	Elective/second major	6cp

Stage 6

Autumn semester

65509	Inorganic Chemistry 2 (New Inorganic Materials)	6cp
xxxxx	Elective/second major	6cp

Spring semester

65607	Physical Chemistry 2	6cp
xxxxx	Elective/second major	6cp

1 Strongly recommended.

2 Not available to students who have completed 68101 Physics 1C.

Note: See the list of second majors on page 146.

Electives

Electives which may be offered by the Department of Chemistry, Materials and Forensic Science include:

65521	Applied Organic Chemistry	6cp
65621	Environmental Chemistry	6cp
65062	Extractive Metallurgy/ Metallurgical Chemistry	6cp
67306	Industrial Ceramics	6cp
67508	Surface Chemistry of Materials	6cp
67305	Polymer Science	6cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assesment tasks may be based on individual or group work. For further details, see the Subject Descriptions section or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in chemistry. It allows selected students to continue with postgraduate studies if desired and enhances their employment prospects. For further information see Bachelor of Science (Honours) in Applied Chemistry (C09026) on page 112.

Professional recognition

With appropriate choice of electives, the course meets the requirements for entry to corporate membership of the Royal Australian Chemical Institute.

Other information

All academic inquiries should be made to:

Course Director, Applied Chemistry
Dr John Kalman
Department of Chemistry,
Materials and Forensic Science
telephone (02) 9514 1728
fax (02) 9514 1628
email John.Kalman@uts.edu.au

Bachelor of Science in Applied Physics

- UTS course code: C10192 (pre-2003: NP05)
- UAC code: 607145
- Testamur title: Bachelor of Science in Applied Physics
- Abbreviation: BSc
- Course Director: Associate Professor Kendal McGuffie
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

This course provides a firm foundation in the study of science, with an in-depth study in applied physics. Major areas of study include electronics, optics, vacuum techniques, computers, and practical applications for measurement and control of the physical environment. Minor studies or electives may be undertaken in a wide range of areas offered within the Faculty of Science or within the University. Students should refer to the Second Majors section in this handbook and contact the Course Director. Students are encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field.

The development of modern technology and its application in a wide variety of industries has created a demand for scientists who have a confident approach to applied problem solving, a deep understanding of the physical principles underlying systems, who are able to utilise modern equipment for measurement and control, and are flexible and adaptable to changing job needs. Applied physics graduates meet this demand and find employment in a wide range of private industries and public authorities.

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional physicists with highly adaptable and practical scientific skills, accompanied by a thorough grounding in theory. Graduates can expect to find employment in a range of industries including telecommunications, technical consulting, medical and health sciences, energy, defense systems, mineral exploration and meteorology. Recent graduates are working in a range of positions in industry, government research laboratories, and universities as research scientists, computer modellers, communications experts, energy consultants and laser and optics specialists.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, Physics and Chemistry. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes. All students are strongly encouraged to undertake the additional year of industrial experience, through enrolling in the Diploma in Scientific Practice (see page 56).

Course duration

This course can be completed in:

- three years, full time
- six years, part time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

The course consists of six academic stages but students are strongly encouraged to include a period of industrial training that extends the minimum completion time to four years leading to the additional award of Diploma in Scientific Practice.

Course program

Full-time program

Stage 1

Autumn semester

33190	Mathematical Modelling for Science	6cp
65101	Chemistry 1C	6cp
68101	Foundations of Physics	6cp
67101	Introduction to Materials	6cp

Stage 2

Spring semester

33290	Computing and Mathematics for Science	6cp
65201	Chemistry 2C	6cp
68201	Physics in Action (Physics 2)	6cp
xxxxx	Other approved subject	6cp

Stage 3

Autumn semester

68314	Electronics	6cp
33xxx	Mathematics for Physical Science	6cp
35170	Introduction to Computing	6cp
68xxx	Imaging Science	6cp

Stage 4

Spring semester

68312	Electrotechnology and Data Analysis	6cp
68411	Vibrations, Quanta and Nucleons (Physics 4)	6cp
68xxx	Quantum Technology	6cp
68xxx	Introduction to Computational Science	6cp
68412	Energy Science and Technology	6cp
xxxxx	Elective/second major	6cp

Stage 5

Autumn semester

68512	Research Methods in Applied Physics	6cp
68511	Quantum and Solid-state Physics	6cp
xxxxx	Elective/second major	12cp

Stage 6

Spring semester

68514	Electronics and Interfacing	6cp
68611	Electromagnetics and Optics	6cp
xxxxx	Elective/second major	12cp

Part-time program

Stage 1

Autumn semester

33190	Mathematical Modelling for Science	6cp
67101	Introduction to Materials	6cp

Spring semester

65101	Chemistry 1C	6cp
68101	Foundations of Physics	6cp

Stage 2

Autumn semester

65201	Chemistry 2C	6cp
xxxx	Other approved subject	6cp

Spring semester

33290	Computing and Mathematics for Science	6cp
68201	Physics in Action (Physics 2)	6cp

Stage 3[1]

Autumn semester

33xxx	Mathematics for Physical Science	6cp
68xxx	Imaging Science	6cp

Spring semester

68411	Vibrations, Quanta and Nucleons (Physics 4)	6cp
68xxx	Quantum Technology	6cp

Stage 4

Autumn semester

35170	Introduction to Computing	6cp
68314	Electronics	6cp

Spring semester

68312	Electrotechnology and Data Analysis	6cp
68xxx	Introduction to Computational Science	6cp

[1] At this point students study subjects in a different order depending on whether they enter Stage 3 in an even or an odd numbered year. Above is shown the program for entry in an odd year. For the other program refer to the Applied Physics Student Coordinator, Kendal McGuffie or Head of the Applied Physics Department, Geoff Anstis.

Stage 5

Autumn semester

68511	Quantum and Solid-state Physics	6cp
xxxxx	Elective/second major	6cp

Spring semester

68611	Electromagnetics and Optics	6cp
xxxxx	Elective/second major	6cp

Stage 6

Autumn semester

68512	Research Methods in Applied Physics	6cp
xxxxx	Elective/second major	6cp

Spring semester

68514	Electronics and Interfacing	6cp
xxxxx	Elective/second major	6cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in applied physics. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information see Bachelor of Science (Honours) in Applied Physics (C09035) on page 113.

Professional recognition

Graduates are eligible for membership of the Australian Institute of Physics.

Other information

All academic inquiries should be made to:

Course Director, Applied Physics
Associate Professor Kendal McGuffie
Department of Applied Physics
telephone (02) 9514 2072
fax (02) 9514 2219
email Kendal.McGuffie@uts.edu.au

Bachelor of Science (Honours) in Applied Chemistry – Forensic Science

- UTS course code: C09025 (pre-2003: NC04)
- UAC code: 607110
- Testamur title: Bachelor of Science (Honours) in Applied Chemistry – Forensic Science
- Abbreviation: BSc(Hons)
- Course Director: Associate Professor Claude Roux
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 192

Overview

This course provides a program of instruction that, together with a research project, prepares students for entry to professional work in the field of applied chemistry or as specialists in the forensic science area. The course includes a firm foundation of studies in the basic sciences, with in-depth development of the discipline of chemistry, emphasising its forensic applications.

Course aims

This course aims to produce professional forensic scientists and chemists with highly adaptable and practical scientific skills, accompanied by a thorough grounding in theory. Graduates can expect to find employment in a range of fields including private investigation, forensic science with the police service, drug enforcement and detection, environmental chemistry, pharmaceuticals and chemical industries. This degree program has an excellent record of graduate employment, with students highly demanded for their analytical and problem-solving skills.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, Physics and Chemistry. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University during the first year (Stages 1 and 2) and 18 hours per week in the second and third years (Stages 3–8). This enables a full stage of the course to be completed in one semester.

Course duration

This course is offered on a four-year, full-time basis (including Honours).

Course structure

The course consists of eight academic stages, including one stage for Honours. Stages 1–4 (first two years) of the program are similar, though not identical to the Bachelor of Science in Applied Chemistry course. Stages 5–8 (final two years) are strongly focused on forensic studies. Stage 8 comprises the Forensic Research Project necessary to graduate with this Honours program.

Course program

Each stage corresponds to one semester of full-time attendance.

Stage 1

Autumn semester

33190	Mathematical Modelling for Science	6cp
65101	Chemistry 1C	6cp
68101	Foundations of Physics	6cp
	and either	
91101	Cells, Genetics and Evolution	6cp
	or	
91701	Medical Science 1	6cp

Stage 2

Spring semester

33290	Computing and Mathematics for Science	6cp
65201	Chemistry 2C	6cp
65241	Principles of Forensic Science	6cp
	and one of	
67101	Introduction to Materials	6cp
68201	Physics in Action (Physics 2)	6cp
91702	Medical Science 2	6cp

Stage 3

Autumn semester

65202	Organic Chemistry 1	6cp
65410	Chemical Safety and Legislation	6cp
65341	Forensic Imaging	6cp
65307	Physical Chemistry 1	6cp

Stage 4

Spring semester

65508	Organic Chemistry 2 (Structure Elucidation and Synthesis)	6cp
65411	Inorganic Chemistry 1 (Transition Metal Chemistry)	6cp
65306	Analytical Chemistry 1	6cp
91141	Biological Evidence	6cp

Stage 5

Autumn semester

65409	Analytical Chemistry 2	6cp
65543	Crime Scene Investigation	6cp
65542	Forensic Toxicology 1	6cp
65541	Physical Evidence 1	6cp

Stage 6

Spring semester

65606	Analytical Chemistry 3	6cp
65607	Physical Chemistry 2	6cp
65642	Forensic Toxicology 2	6cp
65641	Physical Evidence 2	6cp

Stage 7

Autumn semester

65741	Chemistry and Pharmacology of Illicit Drugs	6cp
65742	Fire and Explosion Investigation	6cp
65743	Complex Forensic Cases (Chemistry)	6cp
79024	Complex Forensic Cases (Law)	6cp

Stage 8

Spring semester

65856	Forensic Research Project	24cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

This course is an Honours program. If the required standard for Honours is not achieved at the end of Stage 4 (i.e. a Credit average or better in Stage 3 and 4 subjects), students' enrolment in the course is discontinued and they are offered the option of full-credit transfer to the Bachelor of Science in Applied Chemistry or to the Bachelor of Science.

Professional recognition

The course has been designed to meet the academic requirements for entry to corporate membership of the Royal Australian Chemical Institute.

Other information

All academic inquiries should be made to:

Course Director, Forensic Science
Associate Professor Claude Roux
Department of Chemistry, Materials and Forensic Science
telephone (02) 9514 1718
fax (02) 9514 1628
email Claude.Roux@uts.edu.au

Bachelor of Science in Biomedical Science in Forensic Biology

- UTS course code: C10174 (pre-2003: NA05)
- UAC code: 607115
- Testamur title: Bachelor in Biomedical Science in Forensic Biology
- Abbreviation: BSc
- Course Director: Dr Tamara Sztynda
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

The Bachelor of Science in Biomedical Science in Forensic Biology provides a firm foundation in biomedical sciences and their applications to forensic investigations of human evidence. Specialist forensic science subjects and legal subjects dealing with the presentation of forensic evidence are integrated into the course. Emphasis is placed on the use of modern scientific methods and instrumentation for forensic investigation and on the validation of forensic evidence. Graduates are prepared for entry to professional work as specialists in the forensic sciences area or in the field of biomedical science. Major areas of study include forensic investigations of human evidence (DNA and tissues), molecular biology, biochemistry, microbiology, immunology, and haematology. Students acquire familiarity with advanced instruments and technology, data processing and evaluation, reporting of scientific information and are encouraged to participate in seminar activities. Furthermore, students gain an understanding of the legal and ethical aspects of biological Forensic Science, including privacy considerations, record keeping and legal reporting of evidence. In second and third year, students may also take approved electives to extend their knowledge in specific areas of interest. Students are also encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field. Progression to Honours is also strongly recommended for students.

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional forensic scientists with highly adaptable and practical scientific skills, accompanied by a thorough grounding in biological and biomedical theory. Students gain a sound body of knowledge in biomedical science and its forensic applications, and understand, and are able to apply, the scientific method to problems. Students develop skills in the use of scientific instrumentation and technology, data processing and evaluation, and the reporting of scientific information. Students will be capable of contributing creatively and constructively to scientific practice. They gain an understanding of the legal and ethical aspects of biological forensic science, including privacy considerations, record keeping and legal reporting of evidence. Graduates can expect to find employment as forensic biologists associated with the police services and in private investigative laboratories, quarantine laboratories and environmental agencies. Other career opportunities for graduates are in Commonwealth and State health departments, CSIRO, universities, medical research institutes, pharmaceutical and biomedical industries, and private pathology laboratories. These industries are dependent on a high level of professional competence in experimental techniques in disciplines such as biochemistry, molecular biology, microbiology and pathology. The student's personal choice of electives ensures a broader range of employment options in addition to forensic biology. In particular, the course provides the underpinning knowledge and experimental skills for graduates to progress further to a career in biomedical research by undertaking an Honours degree (see page 111). The course also provides an excellent preparation for entry to graduate medical degrees.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International Students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, they may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Learning and Teaching) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester.

Course duration

Students can complete the course in:

- three years, full time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Course structure

Subjects are divided into core subjects and elective subjects, some of which may form a coherent second major strand. All students enrolled in the degree must satisfactorily complete all core subjects for award of the degree and, in addition, must satisfactorily complete the required number of credit points of elective/second major subjects. Students generally choose these subjects with a particular theme or area of expertise in mind. Electives that are highly relevant or complementary to forensic science are listed in the Recommended electives for the Biomedical Science Forensic Biology course table (see page 70). Students should also refer to the section on second majors in this handbook and contact the Forensic Biology Course Director for advice on selecting second majors and electives. It should be noted that timetable constraints may prevent the undertaking of some elective combinations.

Course program

Full-time program

Stage 1

Autumn semester		
91701	Medical Science 1	6cp
65101	Chemistry 1C	6cp
68041	Physical Aspects of Nature	6cp
91101	Cells, Genetics and Evolution	6cp

Stage 2

Spring semester		
91313	Biochemistry 1	6cp
91702	Medical Science 2	6cp
65241	Principles of Forensic Science	6cp
65201	Chemistry 2C	6cp

Stage 3

Autumn semester		
91314	General Microbiology	6cp
91320	Biochemistry 2	6cp
33116	Statistical Design and Analysis	6cp
xxxxx	Approved elective[1]	6cp

Stage 4

Spring semester		
91132	Molecular Biology 1A	6cp
91326	Analytical Biochemistry	6cp
3xxxx	Forensic Statistics	6cp
xxxxx	Approved elective[1]	6cp

Stage 5

Autumn semester		
91137	DNA Profiling	6cp
91138	Investigation of Human Remains	6cp
65543	Crime Scene Investigation	6cp
xxxxx	Approved elective[1]	6cp

Stage 6

Spring semester		
79024	Complex Forensic Cases (Law)	6cp
91139	Complex Forensic Cases (Biology)	6cp
xxxxx	Approved elective[1]	6cp
xxxxx	Approved elective[1]	6cp

1 See table of recommended electives (see page 70). Students must get approval from the Forensic Biology Course Director when choosing electives.

Recommended electives for the Biomedical Science Forensic Biology course[1]

Subject number	Subject name	Credit points	Recommended stage for subject: Semester offered	Forensic Biology
91129	Transfusion Science	8	S	6
91330	Epidemiology and Public Health Microbiology	6	S	4
91335	Molecular Biology 2	8	S	6
91338	Clinical Bacteriology	8	A	5
91344	Medical and Diagnostic Biochemistry	8	A	5
91345	Biochemistry, Genes and Disease	8	S	6
91351	Immunology 1	3	S	4
91352	Parasitology	8	S	6
91354	Anatomical Pathology	6	A	3
91355	Haematology 1	3	S	4
91358	Haematology 2	8	A	5
91359	Immunology 2	8	S	6
91703	Physiological Systems	6	A	3
91706	Neuroscience	8	A	5
91707	Pharmacology 1	8	A	5
91709	Pharmacology 2	8	S	6
65341	Forensic Imaging	6	A	3

A = Autumn semester S = Spring semester

1 Elective choices must be approved by the Forensic Biology Course Director.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to research work relating to forensic biology. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information, see Bachelor of Science (Honours) in Biomedical Science (see page 118).

Professional recognition

Graduates of this course are eligible for membership of the Australian & New Zealand Forensic Science Society and the Register of Forensic Practitioners.

Other information

All academic inquiries should be made to:

Course Director, Forensic Biology
Dr Tamara Sztynda
Department of Cell and Molecular Biology
telephone (02) 9514 4157
fax (02) 9514 4026
email Tamara.Sztynda@uts.edu.au

Bachelor of Science in Mathematics

- UTS course code: C10154 (pre-2003: MM01)
- UAC code: 605020 (FT); 605021 (PT)
- Testamur title: Bachelor of Science in Mathematics
- Abbreviation: BSc
- Course Director: Dr Geoff Smith
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 144

Course aims

This degree aims to prepare students for employment in industry, commerce and government and to provide the foundation for higher studies in mathematics. It is designed to provide great flexibility by allowing students to follow a course of study which best suits their interests and aspirations. It aims to help students acquire sufficient experience and understanding in a broad range of mathematical disciplines to enable them to apply mathematical and computing techniques to industrial and commercial problems.

Attendance

Most 6-credit-point mathematics subjects involve four hours of class contact per week (typically, three hours of lectures and a one-hour tutorial), although some first-year subjects have a higher contact load of six hours. Some subjects have additional laboratory hours.

Part-time students are accommodated by the provision of evening classes for most subjects. It is expected that part-time students are able to attend classes on one afternoon and three evenings per week during the first two years of the course, and on one afternoon and two evenings per week during later years.

As a general rule, for any given subject, it is wise to devote to home study the same number of hours per week as are allocated to lectures and tutorials in the case of first-year subjects, and twice the number of hours associated with lectures and tutorials per week for more senior subjects.

Course duration

This course is offered on a three-year, full-time, or six-year, part-time basis.

Course structure

The course consists of subjects worth a total of 144 credit points. The standard full-time load is 24 credit points per semester (typically, four subjects each worth 6 credit points) and the standard part-time load is 12 credit points per semester (typically, two subjects both worth 6 credit points).

Details of individual subjects can be found in the Subject Descriptions section in this handbook.

Core subjects

This provides a thorough grounding in the elements of mathematics, statistics, operations research and computing, and introduces their applications. This component occupies 84 credit points of the Pass degree and is taught predominantly during the first two years of the full-time program.

Majors

All majors are offered subject to demand.

This component occupies half of Year 3 of the full-time course (or Years 5 and 6 of the part-time course) and may be taken in the areas of Operations Research, Statistics or Mathematics. This framework provides for specialised study of a particular area.

The **Operations Research major** develops mathematical methods, which may be applied to problems involving planning and decision making. Production scheduling and investment analysis are just two examples of the areas where these methods are applicable.

Many problems in the modern world, in areas as diverse as market research and environmental assessment, give rise to large amounts of data. The **Statistics major** develops the tools required for the collection and analysis of such data, and studies their application to a variety of problems.

The **Mathematics major** develops further geometric, analytic and algebraic tools which underlie solutions to problems in more advanced contexts. These tools are applied in a variety of complex and practical situations.

Electives

Electives total 36 credit points and are chosen by students to strengthen their understanding of areas in which they are interested. At least 24 credit points must be taken as a coherent sequence of subjects, usually an approved sub-major. The remaining 12 credit points may comprise subjects from any faculty of the University, subject to certain restrictions.

Course program

Full-time program

Stage 1

Autumn semester

35100	Mathematical Practice	6cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp
35170	Introduction to Computing	6cp

Stage 2

Spring semester

35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp
3xxxx	Electives	approx. 12cp

Stage 3

Autumn semester

35111	Discrete Mathematics	6cp
35212	Linear Algebra	6cp
35231	Differential Equations	6cp
3xxxx	Electives	approx. 6cp

Stage 4

Spring semester

35232	Advanced Calculus	6cp
35241	Optimisation 1	6cp
35252	Statistics 2	6cp
35281	Numerical Methods	6cp

Stage 5

Autumn semester

35321	Analysis 1	6cp
3xxxx	Major subject 1	6cp
3xxxx	Major subject 2	6cp
3xxxx	Electives	approx. 6cp

Stage 6

Spring semester

3xxxx	Major subject 3	6cp
3xxxx	Major subject 4	6cp
3xxxx	Electives	approx. 12cp

Part-time program

Stage 1

Autumn semester

35100	Mathematical Practice	6cp
35140	Operations Research Modelling	6cp

Spring semester

35101	Mathematics 1	6cp
35151	Statistics 1	6cp

Stage 2

Autumn semester

35102	Mathematics 2	6cp
3xxxx	Electives	approx. 6cp

Spring semester

35170	Introduction to Computing	6cp
35111	Discrete Mathematics	6cp

Stage 3

Autumn semester

35252	Statistics 2	6cp
3xxxx	Electives	approx. 6cp

Spring semester

35212	Linear Algebra	6cp
35231	Differential Equations	6cp

Stage 4

Autumn semester

35241	Optimisation 1	6cp
3xxxx	Electives	approx. 6cp

Spring semester

35232	Advanced Calculus	6cp
3xxxx	Electives	approx. 6cp

Stage 5

Autumn semester

35281	Numerical Methods	6cp
3xxxx	Major subject 1	6cp

Spring semester

35321	Analysis 1	6cp
3xxxx	Major subject 2	6cp

Stage 6

Autumn semester

3xxxx	Major subject 3	6cp
3xxxx	Electives	approx. 6cp

Spring semester

3xxxx	Major subject 4	6cp
3xxxx	Electives	approx. 6cp

Operations Research major: Stages 5–6

Full-time program

Stage 5 (Year 3)

Autumn semester

35342	Optimisation 2	6cp
35363	Simulation Modelling	6cp

Stage 6 (Year 3)

Spring semester

35340	Operations Research Practice	6cp
35361	Probability and Stochastic Processes	6cp

Part-time program

Stage 5 (Year 5)

Autumn semester

35342	Optimisation 2	6cp

Spring semester

35361	Probability and Stochastic Processes	6cp

Stage 6 (Year 6)

Autumn semester

35363	Simulation Modelling	6cp

Spring semester

35340	Operations Research Practice	6cp

Statistics major: Stages 5–6

Full-time program

Stage 5 (Year 3)

Autumn semester

35356	Design and Analysis of Experiments	6cp
35353	Regression Analysis	6cp

Stage 6 (Year 3)

Spring semester

35355	Quality Control	6cp
35361	Probability and Stochastic Processes	6cp

Part-time program

Stage 5 (Year 5)

Autumn semester

35356	Design and Analysis of Experiments	6cp

Spring semester

35353	Regression Analysis	6cp

Stage 6 (Year 6)

Autumn semester

35361	Probability and Stochastic Processes	6cp

Spring semester

35355	Quality Control	6cp

Mathematics major

Two sequences, one in Pure Mathematics and one in Applied Mathematics, are offered, although it is not expected that all subjects in both sequences would be taught in any one year. Students may be required to choose a program combining subjects from both sequences. Students interested in the Mathematics major should discuss their enrolment with the Course Director for the Bachelor of Science in Mathematics, late in the year preceding their intended enrolment. The Mathematics major may not be offered if there is insufficient demand.

Pure Mathematics sequence

Full-time program

Stage 5 (Year 3)

Autumn semester

35313	Pure Mathematics 3A	6cp
35335	Mathematical Methods	6cp

Stage 6 (Year 3)

Spring semester

35314	Pure Mathematics 3B	6cp
35322	Analysis 2	6cp

Part-time program

Stage 5 (Year 5)

Autumn semester

35313	Pure Mathematics 3A	6cp

Spring semester

35314	Pure Mathematics 3B	6cp

Stage 6 (Year 6)

Autumn semester

35335	Mathematical Methods	6cp

Spring semester

35322	Analysis 2	6cp

Applied Mathematics sequence

Full-time program

Stage 5 (Year 3)

Autumn semester

35333	Applied Mathematics 3A	6cp
35335	Mathematical Methods	6cp

Stage 6 (Year 3)

Spring semester

35334	Applied Mathematics 3B	6cp
35382	Numerical Analysis 2	6cp

Part-time program

Stage 5 (Year 5)

Autumn semester

35333	Applied Mathematics 3A	6cp

Spring semester

35334	Applied Mathematics 3B	6cp

Stage 6 (Year 6)

Autumn semester

35335	Mathematical Methods	6cp

Spring semester

35382	Numerical Analysis 2	6cp

Sub-majors

Students may elect to do a sub-major offered by the Faculty of Science or another faculty. It is necessary to discuss the choice with the Electives Coordinator in the Department of Mathematical Sciences, and to obtain appropriate approval from the faculty concerned. The following are possible suggestions for sub-majors. In all cases, full details are available from the Faculty Office (refer also to page 146).

Aboriginal Studies sub-major

The Faculty of Education offers a range of Aboriginal Studies subjects that may be taken as a sub-major, or as elective subjects, as appropriate, within any undergraduate course.

The sub-major provides Aboriginal and non-Aboriginal students with an opportunity to study subjects that are culturally appropriate to an understanding of Aboriginal culture, history and social/political structures. These initial studies serve as a basis for applying critical analysis skills to Aboriginal and non-Aboriginal perspectives on issues and trends which affect the cultural and social integrity of Aboriginal peoples. Consideration is also given to other indigenous people, including Torres Strait Islanders.

Computing sub-major

Note: Students will need to be able to use a Unix system for later subjects in the submajor. A self-teaching package is available

31060	Information Systems Principles	6cp

Programming and Design Strand

Choose three subjects from

31465	Object-oriented Programming	6cp
31469	Object-oriented Design	6cp
31466	Principles of Distributed Computing	6cp
31470	Distributed Computing Architecture	6cp
31473	Data Structures and Procedural Programming	6cp
31475	Requirements Engineering	6cp

Distributed and Network Computing Strand

Choose three subjects from

31466	Principles of Distributed Computing	6cp
31465	Object-oriented Programming	6cp
31470	Distributed Computing Architecture	6cp
31467	Networking 1	6cp
31471	Networking 2	6cp
31474	Database Fundamentals	6cp

Finance sub-major

22107	Accounting for Business	6cp
25115	Economics for Business	6cp
25300	Fundamentals of Business Finance	6cp
25905	Capital Budgeting and Valuation (Advanced)	6cp
25906	Portfolio Theory and Investment Analysis (Advanced)	6cp
25620	Derivative Securities	6cp

This sequence will exhaust all elective options for students taking this sub-major.

Physics sub-majors

The Department of Applied Physics has two sub-majors, one in Physics and one in Electronics. Both contain two compulsory subjects. The remaining subjects, with a total of at least 12cp must be chosen from a selection of subjects appropriate to the interests of the students, in consultation with the Department of Applied Physics.

68101	Foundations of Physics	6cp
68201	Physics in Action (Physics 2)	6cp

Subjects in the Bachelor of Science in Mathematics

Subject number	Subject name	Semester offered	Credit points	Prerequisites
33401	Introductory Mathematical Methods[1]	A	6	Nil
35010	Foundation Mathematics[1]	A,S	6	Nil
35100	Mathematical Practice	A	6	Nil
35101	Mathematics 1	A,S	6	Nil
35102	Mathematics 2	A,S, Summer	6	35101, 35140c
35106	Mathematics in Sport[1]	subject to demand	6	Nil
35111	Discrete Mathematics	A,S	6	Nil
35140	Operations Research Modelling	A,S	6	Nil
35151	Statistics 1	A,S	6	Nil
35170	Introduction to Computing	A,S	6	Nil
35205	History of Mathematics[1]	subject to demand	6	Nil
35212	Linear Algebra	A,S	6	35140
35231	Differential Equations	A,S	6	35102 , 35212c
35232	Advanced Calculus	S	6	35102
35241	Optimisation 1	A,S	6	35102, 35140
35252	Statistics 2	A,S	6	35102, 35151
35254	Health Statistics[1]	S	6	35151
35281	Numerical Methods	A,S	6	35102, 35151 and either 35170 or 31465
35292-6	Project	A,S	2-6	By arrangement
35313	Pure Mathematics 3A	subject to demand	6	35231, 35232
35314	Pure Mathematics 3B	subject to demand	6	35111
35321	Analysis 1	A,S	6	35102
35322	Analysis 2	S	6	35321, 35212
35333	Applied Mathematics 3A	subject to demand	6	35232, 35335c
35334	Applied Mathematics 3B	subject to demand	6	35333, 35335
35335	Mathematical Methods	subject to demand	6	35231
35340	Operations Research Practice	S	6	35241, 35252
35342	Optimisation 2	A	6	35241
35344	Network Optimisation	subject to demand	6	35241
35353	Regression Analysis	A,S	6	35252
35355	Quality Control	S	6	35252
35356	Design and Analysis of Experiments	A	6	35212, 35252
35361	Probability and Stochastic Processes	A,S	6	35252
35363	Simulation Modelling	A	6	35170
35382	Numerical Analysis 2	subject to demand	6	35281
35384	Financial Modelling	S	6	35102, 35151
35391	Seminar (Mathematics)	subject to demand	6	By arrangement
35392	Seminar (Operations Research)	subject to demand	6	By arrangement
35393	Seminar (Statistics)	subject to demand	6	By arrangement
35394	Seminar (Computing)	subject to demand	6	By arrangement

A = Autumn semester **S** = Spring semester **c** = Corequisite

[1] These are not core or major subjects.

Electives

Electives occupy 36 credit points of the degree and are split into **free electives** and **structured electives**.

Free electives

Free electives, whose total weight cannot exceed 12 credit points, provide students with an opportunity to select subjects which accommodate their various interests and needs in a less formal manner than is the case for structured electives. These subjects can be taken from any faculty within the University, or from another university if the subject area is not represented at UTS.

Subjects offered by the Department of Mathematical Sciences and not included in a student's chosen major may also be taken as free electives. In particular, the following subjects may be offered, subject to demand:

35106	Mathematics in Sport	6cp
35205	History of Mathematics	6cp
35254	Health Statistics	6cp
35292–6	Project	2–6cp
35344	Network Optimisation	6cp
35384	Financial Modelling	6cp
35391	Seminar (Mathematics)	6cp
35392	Seminar (Operations Research)	6cp
35393	Seminar (Statistics)	6cp
35394	Seminar (Computing)	6cp

Note: The subject 35384 Financial Modelling is not available to students taking the Operations Research major or the Finance sub-major.

Languages and other subjects from the Faculties of Humanities and Social Sciences, Science and Business are also common choices for free electives. The choice of free electives must be discussed with academic advisers and must be approved by the Electives Coordinator, who will ensure that no subjects specifically prohibited by the Department are included. The prohibited list includes subjects of a mathematical nature which are taught elsewhere in the University, and which provide coverage of material that is already incorporated in subjects offered by this Department.

Structured electives

At least 24 credit points must be taken as a coherent sequence of subjects. This provides an opportunity for students to systematically develop knowledge of some discipline of their choice. The possibilities are:

- a second major within the Bachelor of Science in Mathematics degree
- the Computing sub-major offered by the Faculty of Information Technology
- existing majors or sub-majors within the University, that have been approved by the Faculty as appropriate for use as structured electives, or
- subject sequences which provide for the systematic development of a topic but which are not recognised formally as either a major or sub-major. These sequences must be negotiated between the students and the Electives Coordinator.

Honours

Students contemplating taking Honours are advised to consult the Course Director for Mathematics (Honours) or the Course Director for the Bachelor of Science in Mathematics, upon completing the core of the Bachelor of Science in Mathematics degree (see page 113).

Other information

All inquiries should be made to:

Course Director, Bachelor of Science in Mathematics
Dr Geoff H Smith
Department of Mathematical Sciences
telephone (02) 9514 2236
fax (02) 9514 1512
email Geoff.H.Smith@uts.edu.au

Bachelor of Mathematics and Finance

- UTS course code: C10155 (pre-2003: MM03)
- UAC code: 609040 (FT); 609041 (PT)
- Testamur title: Bachelor of Mathematics and Finance
- Abbreviation: BMathFin
- Course Director: Dr Layna Groen
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 144

Overview

The years since deregulation of the Australian financial system have witnessed many sweeping changes and a considerable increase in the financial and economic activity of many Australian corporations. During this same period there has been an increasing use by major financial institutions of the sophisticated quantitative techniques that have been developed since the early 1970s. As a consequence, there is a demand for graduates trained in both mathematics and finance.

To meet this need, the Bachelor of Mathematics and Finance degree is offered jointly by the Department of Mathematical Sciences and the School of Finance and Economics in the Faculty of Business.

Students graduating from the Bachelor of Mathematics and Finance will have undertaken an integrated sequence of subjects in mathematics, statistics, finance, economics, accounting, and computing, and will therefore have sound training in both the traditional theory of finance and the mathematical aspects of modern portfolio management techniques. As a result, graduates should find interesting and rewarding employment in major financial institutions such as merchant banks, insurance companies and government instrumentalities. The Bachelor of Mathematics and Finance is offered as a Pass degree, with an additional year for an Honours degree. All students eligible to receive the Bachelor of Mathematics and Finance are awarded the degree at the same level.

Note: Due to minor changes in subjects and subject sequences, students who commenced this degree prior to 2002 may need to consult the Course Director regarding subject choices (see also pages 143–151).

Attendance

In the first four years of the course, part-time students are expected to be able to attend classes on one afternoon and two or three evenings per week. The final two years may require attendance at morning classes because some subjects, which form parts of other degrees, are not offered at night. Programs are arranged individually for part-time students to spread the eight subjects of Year 3 of the full-time course over two years.

Course duration

The degree is offered both as a full-time course over three years and as a part-time course over six years.

Course program

Full-time program

Stage 1

Autumn semester

22107	Accounting for Business	6cp
25115	Economics for Business	6cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp

Stage 2

Spring semester

79203	Business Law and Ethics	6cp
25300	Fundamentals of Business Finance	6cp
35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp

Stage 3

Autumn semester

25556	The Financial System	6cp
35170	Introduction to Computing	6cp
35212	Linear Algebra	6cp
35111	Discrete Mathematics	6cp

Stage 4

Spring semester

25906	Portfolio Theory and Investment Analysis (Advanced)	6cp
25410	Corporate Financial Analysis	6cp
35241	Optimisation 1	6cp
35252	Statistics 2	6cp

Stage 5

Autumn semester

25620	Derivative Securities	6cp
35231	Differential Equations	6cp
35321	Analysis 1	6cp
35353	Regression Analysis	6cp

Stage 6

Spring semester

25905	Capital Budgeting and Valuation (Advanced)	6cp
25606	Financial Time Series	6cp
35361	Probability and Stochastic Processes	6cp
35281	Numerical Methods[1]	6cp
	or	
35322	Analysis 2[1]	6cp

1 Students not intending to proceed to Honours must take 35281 Numerical Methods in their Year 3 program. Students intending to proceed to the Honours degree must take 35322 Analysis 2 in their Year 3 program.

Part-time program

Stage 1

Autumn semester

22107	Accounting for Business	6cp
35140	Operations Research Modelling	6cp

Spring semester

35101	Mathematics 1	6cp
35151	Statistics 1	6cp

Stage 2

Autumn semester

25115	Economics for Business	6cp
35102	Mathematics 2	6cp

Spring semester

25300	Fundamentals of Business Finance	6cp
35170	Introduction to Computing	6cp

Stage 3

Autumn semester

25556	The Financial System	6cp
35252	Statistics 2	6cp

Spring semester

25906	Portfolio Theory and Investment Analysis (Advanced)	6cp
35212	Linear Algebra	6cp

Stage 4

Autumn semester

25620	Derivative Securities	6cp
35241	Optimisation 1	6cp

Spring semester

35111	Discrete Mathematics	6cp
35353	Regression Analysis	6cp

Stage 5

Autumn semester

35281	Numerical Methods[1]	6cp
79203	Business Law and Ethics	6cp

Spring semester

35321	Analysis 1	6cp
35231	Differential Equations	6cp

Stage 6

Autumn semester

25410	Corporate Financial Analysis	6cp
35361	Probability and Stochastic Processes	6cp

Spring semester

25905	Capital Budgeting and Valuation (Advanced)	6cp
25606	Financial Time Series	6cp

1 Should a part-time student wish to enrol in the Bachelor of Mathematics and Finance (Honours) program, they may undertake reading to satisfy the prerequisite requirements equivalent to 35322 Analysis 2.

Honours

Honours degree graduates are particularly sought after and their skills enable them to compete for high-entry-level jobs in the banking sector. It is expected that most students will opt to undertake this additional year. For further information see Bachelor of Mathematics and Finance (Honours), on page 116.

Other information

All inquiries should be made to:

Course Director, Bachelor of Mathematics and Finance
Dr Layna Groen
Department of Mathematical Sciences
telephone (02) 9514 2266
fax (02) 9514 2248
email Layna.Groen@uts.edu.au

Core subjects in the Bachelor of Mathematics and Finance

Subject number	Subject name	Semester offered	Credit points	Prerequisites
22107	Accounting for Business	A,S	6	Nil
79203	Business Law and Ethics	A,S	6	Nil
25115	Economics for Business	A,S	6	Nil
25300	Fundamentals of Business Finance	A,S	6	22107, 25115, 35151
25410	Corporate Financial Analysis	A,S	6	22107, 25300
25606	Financial Time Series	S	6	25906, 35151
25620	Derivative Securities	A,S	6	25906
25556	The Financial System	A,S	6	25300
25905	Capital Budgeting and Valuation (Advanced)	S	6	25556, 25620c
25906	Portfolio Theory and Investment Analysis	S	6	35102, 25300
35101	Mathematics 1	A,S	6	Nil
35102	Mathematics 2	A,S	6	35101, 35140c
35111	Discrete Mathematics	A,S	6	Nil
35140	Operations Research Modelling	A,S	6	Nil
35151	Statistics 1	A,S	6	Nil
35170	Introduction to Computing	A,S	6	Nil
35212	Linear Algebra	A,S	6	35140
35231	Differential Equations	A,S	6	35102
35241	Optimisation 1	A,S	6	35102, 35140
35252	Statistics 2	A,S	6	35102, 35151
35281	Numerical Methods	A,S	6	35102, 35151, 35170
35321	Analysis 1	A,S	6	35102
35322	Analysis 2	S	6	35321, 35212
35353	Regression Analysis	A,S	6	35252
35361	Probability and Stochastic Processes	A,S	6	35252

A = Autumn semester **S** = Spring semester **c** = Corequisite

Bachelor of Mathematics and Computing

- UTS Course code: C10158 (pre-2003: MM07)
- UAC code: 609045
- Testamur title: Bachelor of Mathematics and Computing
- Abbreviation: BMathComp
- Course Director: Dr Tim Langtry
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

The increasing dependence of society on information technology has brought with it an increasing requirement for graduates with both computational and analytic skills. This degree is designed for students who are interested in both mathematics and computing, and offers the prospect of careers in fields which require a sound knowledge of computing together with the ability to analyse and model practical situations. Demand for these skills is increasing as quantitative analysis becomes more widespread in dealing with commercial and industrial problems. At the same time, there is a growing need for teachers with skills in computing as well as mathematics, and graduates of this course are well qualified to fill this role.

Course duration

The degree is offered as a full-time course over three years and as a part-time course over six years.

Course structure

The Bachelor of Mathematics and Computing is offered jointly with the Faculty of Information Technology as a Pass degree requiring the completion of subjects with a total value of 144 credit points.

The course consists of an integrated sequence of subjects in the mathematical sciences and information technology. The course program given below describes three variants: a generic program, a program which articulates with the Operations Research specialisation of the Bachelor of Science (Honours) in Mathematics and a program which articulates with the Statistics specialisation of the Bachelor of Science (Honours) in Mathematics. All three variants articulate with the Bachelor of Science (Honours) in Information Technology. In the latter two variants, the mathematics elective subject in the generic program is specified to satisfy prerequisite requirements either in Operations Research or in Statistics. Refer to Recommended subject strands on page 143.

Course program

The generic course program is outlined below. However, students wishing to do so may modify this program in order to specialise their studies in one of the mathematical sciences of Operations Research or Statistics. Students who perform sufficiently well may then choose to proceed to an Honours program in one of these specialisations, or in Information Technology. The course programs specialising in Operations Research and Statistics also articulate with the corresponding strands of the Bachelor of Science (Honours) in Mathematics course (see page 113).

Full-time program

Stages 1–2

Stage 1

Autumn semester

31465	Object-oriented Programming	6cp
31466	Principles of Distributed Computing	6cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp

Stage 2

Spring semester

31469	Object-oriented Design	6cp
31472	Introduction to Collaborative Systems	6cp
35140	Operations Research Modelling	6cp
35102	Mathematics 2	6cp

Generic: Stages 3–6

Stage 3

Autumn semester

31473	Data Structures and Procedural Programming	6cp
31474	Database Fundamentals	6cp
31475	Requirements Engineering	6cp
	plus one of	
31468	Information Classification and Control	6cp
31470	Distributed Computing Architecture	6cp

Stage 4

Spring semester

31476	Systems Development Project	12cp
35252	Statistics 2	6cp
35281	Numerical Methods	6cp

Note: Students wishing to take 31468 Information Classification and Control in Autumn semester of Year 2 should complete 35281 Numerical Methods in Spring semester of Year 2. Students wishing to take 31470 Distributed Computing Architecture in Spring semester of Year 2 should complete 35281 Numerical Methods in Autumn semester of Year 2.

Stage 5

Autumn semester

31478	Project Management and Quality Assurance	6cp
35241	Optimisation 1	6cp
35363	Simulation Modelling	6cp
35383	High Performance Computing	6cp

Stage 6

Spring semester

31479	IT Professional and Society	6cp
35111	Discrete Mathematics	6cp
35344	Network Optimisation	6cp
35xxx	Mathematics Elective	6cp

Operations Research specialisation: Stages 3–4

Stage 3

Autumn semester

31473	Data Structures and Procedural Programming	6cp
31474	Database Fundamentals	6cp
31475	Requirements Engineering	6cp
	plus one of	
31468	Information Classification and Control	6cp
31470	Distributed Computing Architecture	6cp

Stage 4

Spring semester

31476	Systems Development Project	12cp
35241	Optimisation 1	6cp
35281	Numerical Methods	6cp

Note: Students wishing to take 31468 Information Classification and Control in Autumn semester of Year 2 should complete 35281 Numerical Methods in Spring semester of Year 2. Students wishing to take 31470 Distributed Computing Architecture in Spring semester of Year 2 should complete 35281 Numerical Methods in Autumn semester of Year 2.

Operations Research specialisation: Stages 5–6 (for students not intending to proceed to the Bachelor of Science (Honours) in Mathematics)

Stage 5

Autumn semester

31478	Project Management and Quality Assurance	6cp
35383	High Performance Computing	6cp
35252	Statistics 2	6cp
35363	Simulation Modelling	6cp

Stage 6

Spring semester

31479	IT Professional and Society	6cp
35111	Discrete Mathematics	6cp
	plus two of	
35340	Operations Research Practice	6cp
35344	Network Optimisation	6cp
35361	Probability and Stochastic Processes	6cp

Operations Research specialisation: Stages 5–6 (for students intending to proceed to the Bachelor of Science (Honours) in Mathematics)

Stage 5

Autumn semester

31478	Project Management and Quality Assurance	6cp
35383	High Performance Computing	6cp
35252	Statistics 2	6cp
35342	Optimisation 2	6cp

Stage 6

Spring semester

31479	IT Professional and Society	6cp
35111	Discrete Mathematics	6cp
35340	Operations Research Practice	6cp
35361	Probability and Stochastic Processes	6cp

Statistics specialisation: Stages 3–6

Stage 3

Autumn semester

31473	Data Structures and Procedural Programming	6cp
31474	Database Fundamentals	6cp
31475	Requirements Engineering	6cp
35281	Numerical Methods	6cp

Stage 4

Spring semester

31476	Systems Development Project	12cp
35212	Linear Algebra	6cp
35252	Statistics 2	6cp

Stage 5

Autumn semester

31478	Project Management and Quality Assurance	6cp
35383	High Performance Computing	6cp
35361	Probability and Stochastic Processes	6cp
35356	Design and Analysis of Experiments	6cp

Stage 6

Spring semester

31479	IT Professional and Society	6cp
35111	Discrete Mathematics	6cp
35353	Regression Analysis	6cp
	plus one of	
31468	Information Classification and Control	6cp
31470	Distributed Computing Architecture	6cp

Note: Students wishing to take 31468 Information Classification and Control in Autumn semester of Year 3 should complete 35361 Probability and Stochastic Processes in Spring semester of Year 3. Students wishing to take 31470 Distributed Computing Architecture in Spring semester of Year 3 should complete 35361 Probability and Stochastic Processes in Autumn semester of Year 3.

Part-time program

Stages 1–6

Stage 1

Autumn semester

31465	Object-oriented Programming	6cp
35140	Operations Research Modelling	6cp

Stage 2

Spring semester

35101	Mathematics 1	6cp
35151	Statistics 1	6cp

Stage 3

Autumn semester

31472	Introduction to Collaborative Systems	6cp
35102	Mathematics 2	6cp

Stage 4

Spring semester

31469	Object-oriented Design	6cp
35111	Discrete Mathematics	6cp

Stage 5

Autumn semester

31475	Requirements Engineering	6cp
35252	Statistics 2	6cp

Stage 6

Spring semester

31474	Database Fundamentals	6cp
31466	Principles of Distributed Computing	6cp

Generic: Stages 7–12

Stage 7

Autumn semester

31473	Data Structures and Procedural Programming	6cp
35363	Simulation Modelling	6cp

Stage 8

Spring semester

31476	Systems Development Project	12cp

Stage 9

Autumn semester

35281	Numerical Methods	6cp
35241	Optimisation 1	6cp

Stage 10

Spring semester

35344	Network Optimisation	6cp
	plus one of	
31470	Distributed Computing Architecture	6cp
31468	Information Classification and Control	6cp

Stage 11

Autumn semester

31478	Project Management and Quality Assurance	6cp
35383	High Performance Computing	6cp

Stage 12

Spring semester

31479	IT Professional and Society	6cp
35xxx	Mathematics elective	6cp

Operations Research specialisation: Stages 7–12

Stage 7

Autumn semester

31473	Data Structures and Procedural Programming	6cp
35241	Optimisation 1	6cp

Stage 8

Spring semester

31476	Systems Development Project	12cp

Stage 9

Autumn semester

35281	Numerical Methods	6cp
35363	Simulation Modelling	6cp

Stage 10

Spring semester

35xxx	Operations Research Elective 1	6cp
	plus one of	
31470	Distributed Computing Architecture	6cp
31468	Information Classification and Control	6cp

Stage 11

Autumn semester

31478	Project Management and Quality Assurance	6cp
35383	High Performance Computing	6cp

Stage 12

Spring semester

31479	IT Professional and Society	6cp
35xxx	Operations Research Elective 2	6cp

Note: For students not intending to proceed to the Bachelor of Science (Honours) in Mathematics, the Operations Research elective subjects must be chosen from 35344 Network Optimisation, 35340 Operations Research Practice and 35361 Probability and Stochastic Processes. For students intending to proceed to the Honours course, the Operations Research elective subjects must be 35340 Operations Research Practice and 35361 Probability and Stochastic Processes, and the subject 35342 Optimisation 2 should replace 35363 Simulation Modelling in Autumn semester of Year 5.

Statistics specialisation: Stages 7–12

Stage 7

Autumn semester

31473	Data Structures and Procedural Programming	6cp
	plus one of	
31470	Distributed Computing Architecture	6cp
31468	Information Classification and Control	6cp

Stage 8

Spring semester

31476	Systems Development Project	12cp

Stage 9

Autumn semester

35281	Numerical Methods	6cp
35361	Probability and Stochastic Processes	6cp

Stage 10

Spring semester

35212	Linear Algebra	6cp
31478	Project Management and Quality Assurance	6cp

Stage 11

Autumn semester

35356	Design and Analysis of Experiments	6cp
35383	High Performance Computing	6cp

Stage 12

Spring semester

31479	IT Professional and Society	6cp
35353	Regression Analysis	6cp

Electives

The Generic course program allows for a 6-credit-point elective subject in mathematics. This must be taken from the list of subjects below, ensuring that prerequisites are satisfied.

35212	Linear Algebra	6cp
35231	Differential Equations	6cp
35232	Advanced Calculus	6cp
35321	Analysis 1	6cp
35340	Operations Research Practice	6cp
35342	Optimisation 2	6cp
35353	Regression Analysis	6cp
35355	Quality Control	6cp
35361	Probability and Stochastic Processes	6cp

Other information

All inquiries should be made to:

Course Director, Bachelor of Mathematics and Computing
Dr Tim Langtry
Department of Mathematical Sciences
telephone (02) 9514 2261
fax (02) 9514 1537
email Tim.Langtry@uts.edu.au

Core subjects in the Bachelor of Mathematics and Computing

Subject number	Subject name	Semester offered	Credit points	Prerequisites
31465	Object-oriented Programming	A,S	6	Nil
31466	Principles of Distributed Computing	A,S	6	Nil
31468	Information, Classification and Control[1]	A	6	Nil
31469	Object-oriented Design	S	6	31465
31470	Distributed Computing Architecture[1]	S	6	31465, 31466
31472	Introduction to Collaborative Systems	S	6	Nil
31473	Data Structures and Procedural Programming	A,S	6	31469
31474	Database Fundamentals	A,S	6	Nil
31475	Requirements Engineering	A	6	31472
31476	Systems Development Project	S	12	31474, 31475
31478	Project Management and Quality Assurance	A	6	31476
31479	IT Professional and Society	S	6	31476
35101	Mathematics 1	A,S	6	Nil
35102	Mathematics 2	A,S	6	35101, 35140c
35111	Discrete Mathematics	A,S	6	Nil
35140	Operations Research Modelling	A,S	6	Nil
35151	Statistics 1	A,S	6	Nil
35212	Linear Algebra[1]	A,S	6	35140
35241	Optimisation 1	A,S	6	35102, 35140
35252	Statistics 2	A,S	6	35102, 35151
35281	Numerical Methods	A,S	6	35102, 35151 and either 35170 or 31465
35340	Operations Research Practice[1]	S	6	35241, 35252
35342	Optimisation 2[1]	A	6	35241
35344	Network Optimisation[1]	S	6	35241
35353	Regression Analysis[1]	A,S	6	35252
35356	Design and Analysis of Experiments[1]	A	6	35212, 35252
35361	Probability and Stochastic Processes[1]	A,S	6	35252
35363	Simulation Modelling[1]	A	6	35170
35383	High Performance Computing	A	6	35281

A = Autumn semester **S** = Spring semester **c** = Corequisite

[1] These are elective subjects.

Bachelor of Health Science in Traditional Chinese Medicine

- UTS course code: C10186 (pre-2003: NH06)
- UAC code: 607005
- Testamur title: Bachelor of Health Science in Traditional Chinese Medicine
- Abbreviation: BHlthSc
- Course Director: Mr Peter Meier
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 192

Note: It is expected a revised course will replace the current course in 2003.

Overview

This course provides graduates with a professional entry level for the practice of acupuncture and Chinese patent herbal medicine, the two major branches of Traditional Chinese Medicine. Major areas of study include Traditional Chinese Medicine theory and philosophical foundations; acupuncture techniques; Chinese materia medica and clinical herbal prescriptions; moxibustion and *tuina* (Chinese massage); diagnosis; clinical skills; western medical sciences appropriate to a primary contact health care practitioner; practice management; and research methods. Students have the opportunity to transfer into the combined degree, Bachelor of Health Science in Traditional Chinese Medicine, Bachelor of Arts in International Studies (China major). This involves an additional two years of language and culture training in Australia and in China.

Course aims

This course aims to produce professional Chinese medicine practitioners with highly adaptable and practical clinic skills accompanied by a thorough grounding in theory. Most graduates go on to work in private practice, either setting up their own business or joining one of the many growing Chinese medicine practices throughout Australia. Important to the learning environment of this course are the working clinics where students gain first-hand, practical experience treating patients under the guidance of qualified health professionals.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC English and studies in Mathematics or Science. Non-recent school leavers must apply through UAC in addition to submitting a Personal Statement to UTS. Applications for non-recent school leavers close on September 30

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Learning and Teaching) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. This also involves students practising their skills in the UTS Acupuncture and Herbal Medicine Clinics as required during the course.

Course duration

This course can be completed over:

- four years, full time
- six years, full time for the combined degree with Bachelor of Arts in International Studies, or
- five years, full time with Honours.

Course structure

The course consists of eight academic stages, taken over four years, full time.

Course program

Stage 1

Autumn semester

99560	Introduction to TCM	6cp
99502	Foundations of TCM	6cp
99563	Health Sciences 1	6cp
99642	Clinic Theory and Clinic Level 1	4cp

Stage 2

Spring semester

99564	The Physiology of *Qi*	4cp
99617	Point Location 1	8cp
99570	Health Sciences 2	6cp
92167	Foundations of Helping and Caring	4cp
99643	Clinic Theory and Clinic Level 2	4cp

Stage 3

Autumn semester

99618	Chinese Diagnostic System 1	6cp
99567	Introduction to Chinese Herbal Medicine	6cp
99636	Essentials of Pathophysiology	6cp
99644	Clinic Theory and Clinic Level 3	4cp

Stage 4

Spring semester

99620	History and Philosophy of TCM	4cp
99621	Chinese Diagnostic System 2	6cp
99622	Pharmacology of Traditional Chinese Medicine	6cp
99579	Chinese Massage (*Tuina*)	6cp
99645	Clinic Theory and Clinic Level 4	4cp

Stage 5

Autumn semester

99623	Chinese Herbal Formulae	8cp
99584	Clinical Features of Disease	6cp
99646	Clinic Theory and Clinic Level 5	6cp

Stage 6

Spring semester

99625	Research Methods	6cp
99626	Microsystems and Advanced Treatment Techniques	8cp
99627	Clinical Practicum	8cp
99647	Clinic Theory and Clinic Level 6	6cp

Stage 7

Autumn semester

99629	Chinese Medical Classics	4cp
99630	Clinical Practice 1	12cp
99637	TCM Disease States 1	4cp

Stage 8

Spring semester

99591	Practice Management	4cp
99590	Special Topics in TCM (Intermodal and Professional)	8cp
99631	Clinical Practice 2	12cp
99638	TCM Disease States 2	4cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, seminar presentations, and clinic practice evaluations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in Traditional Chinese Medicine. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. Further information on Honours can be found on page 111.

Professional recognition

Graduates of this course qualify for professional membership of most Australasian Chinese medicine professional associations.

Other information

All academic inquiries should be made to:

Course Director, Traditional Chinese Medicine
Mr Peter Meier
Department of Health Sciences
Faculty of Science
telephone (02) 9514 7858 or (02) 9514 2500
fax (02) 9514 7866
email Peter.Meier@uts.edu.au

Bachelor of Medical Science

- UTS course code: C10184 (pre-2003: NH04)
- UAC code: 607050
- Testamur title: Bachelor of Medical Science
- Abbreviation: BMedSc
- Course Director: Associate Professor Graham Nicholson
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

The Bachelor of Medical Science degree is designed to educate and train graduates for careers in medical and health-related sciences. Major areas of study include anatomy, physiology, behavioural science, neuroscience, and pharmacology. Emphasis is placed on medical and preclinical science areas structured to provide knowledge and understanding of the human body, targeting its structure, function and disease processes both at a cellular, whole organ and behavioural level. In the later stages of the degree, students also select elective subjects to provide a major specialised strand. Elective strands focus on either additional medical science areas such as molecular biology, immunology, haematology and clinical biochemistry, or electives from a wide range of areas offered within the Faculty of Science or within the University. See the Recommended electives for Biomedical and Medical Science courses table on page 93, the Second majors section on page 146, or the Course Director for more details. Students are encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field (see page 56).

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional medical scientists with highly adaptable and practical scientific skills accompanied by a thorough grounding in theory. Graduates can expect to find employment in a range of areas including pharmaceutical, pathology and biomedical industries; biotechnology companies; medical research in research institutes, hospitals, industry and universities; and other health-related professions at both State and Commonwealth levels. In addition to employment in these areas, graduates also have the background knowledge and skills that are necessary for entry into graduate medical and dentistry degrees as well as for preparing them for other vocationally-oriented courses in the areas of occupational health and safety, biomedical engineering, nutrition and dietetics, osteopathy, audiology, public health and health administration.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester.

Course duration

This course is offered over:

- three years, full time

- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

The course consists of six stages offered on a full-time attendance basis only. Subjects are divided into core subjects and elective subjects, some of which may form a coherent second major strand. All students enrolled in the course must satisfactorily complete a total of 40 credit points of elective/second major subjects for award of the degree. Students generally choose these subjects with a particular theme or area of expertise in mind, such as a particular area of study, through subjects available within the biological and biomedical sciences, or by way of subjects from other parts of the Faculty of Science or other faculties of UTS. Examples of electives are given in the Recommended electives for the Biomedical Science and Medical Science courses table on page 93. Students may be eligible to take a second major in the biomedical science area (provided that they fulfil all of the prerequisites for subjects listed in the recommended biomedical subject strands).

Course program

Stage 1

Autumn semester

33116	Statistical Design and Analysis	6cp
65101	Chemistry 1C	6cp
91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp

Stage 2

Spring semester

91313	Biochemistry 1	6cp
65201	Chemistry 2C	6cp
91702	Medical Science 2	6cp
68041	Physical Aspects of Nature	6cp

Stage 3

Autumn semester

91703	Physiological Systems	6cp
91314	General Microbiology	6cp
xxxxx	Electives/second major	12cp

Stage 4

Spring semester

91704	Behavioural Sciences	6cp
91705	Medical Devices and Diagnostics	6cp
xxxxx	Electives/second major	12cp

Stage 5

Autumn semester

91706	Neuroscience	8cp
91707	Pharmacology 1	8cp
xxxxx	Electives/second major	8cp

Stage 6

Spring semester

91708	Psychophysiology	8cp
91709	Pharmacology 2	8cp
xxxxx	Electives/second major	8cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in medical science. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information see Bachelor of Medical Science (Honours) (C09031) on page 117.

Other information

All academic inquiries should be made to:

Course Director, Medical Science
Associate Professor Graham Nicholson
Department of Health Sciences
telephone (02) 9514 2230, (02) 9514 2234
fax (02) 9514 2228
email Graham.Nicholson@uts.edu.au

Bachelor of Science in Biomedical Science

- UTS course code: C10115 (pre-2003: KB02)
- UAC code: 607013
- Testamur title: Bachelor of Science in Biomedical Science
- Abbreviation: BSc
- Course Director: Dr Mary Davey
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

This course provides an in-depth understanding of biological processes with emphasis on human biomedical science and laboratory experimentation. Major areas of study include biochemistry, molecular biology, microbiology, immunology, haematology and pathology. Research skills are encouraged in the final stages of the course through project assignments. Students acquire familiarity with advanced instruments and technology and are encouraged to participate in seminar activities. In third year, students complete a number of elective subjects, totaling a minimum of 48 credit points. At least one half of these must be designated biomedical science electives, however students wishing to obtain a solid grounding in biomedical science are advised to choose their additional electives from the table of Recommended electives for the Biomedical Science and Medical Science courses on page 93. Electives may, however, be taken from a wide range of areas offered within the Faculty of Science or within the University. See the Second majors section of this handbook on page 146 and your Course Director for more details. Students are also encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field (see page 56).

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to provide an understanding of how the body functions at a cellular and whole organ level; how this function is disturbed by trauma, or inherited, or acquired by infectious disease; and how disease states are diagnosed by clinical laboratory tests. Students also gain an understanding of current medical research aimed at improving diagnosis, prevention and treatment of disease. The aim is to produce professional biomedical scientists with highly adaptable and practical scientific skills accompanied by a thorough grounding in theory. It encompasses a number of interface areas between modern technology, biology and medicine. Graduates can expect to find employment in a range of areas including working with clinical pathologists, surgeons and other medical specialists in the control and elimination of disease. The course also provides an excellent preparation for entry to graduate medical degrees. Other career opportunities for biomedical scientists are in Commonwealth and State health departments, forensic biology laboratories, the Repatriation Department, CSIRO, universities, medical research institutes, pharmaceutical and biomedical industries, biotechnology companies, private pathology laboratories and veterinary laboratories. These industries are dependent on a high level of professional competence in experimental techniques in disciplines such as biochemistry, microbiology and pathology. The course also provides the underpinning knowledge and experimental skills for graduates to progress further to a career in biomedical research by undertaking an Honours degree (see page 118).

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only).

Once a student's application to study has been accepted, they may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

Students can complete the course in:

- three years, full time
- six years, part time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

Subjects are divided into core subjects and elective subjects, some of which may form a coherent second major strand. All students enrolled in the degree must satisfactorily complete all core subjects for award of the degree and, in addition, must satisfactorily complete the required number of credit points of elective/second major subjects. Students generally choose these subjects with a particular theme or area of expertise in mind. Several recommended subject strands, which provide strengths in specific disciplines within biomedical science, are listed following the course program outline on page 92. Electives that are highly relevant or complementary to biomedical science are also listed in the table of Recommended electives for the Biomedical Science and Medical Science courses on page 93. Students should also refer to the section on recommended science strands and second majors in this handbook on pages 143–151 and contact the Biomedical Science Course Director for advice on selecting second majors and electives. It should be noted that timetable constraints may prevent the undertaking of some elective combinations.

Course program

Full-time program

Stage 1

Autumn semester

33116	Statistical Design and Analysis	6cp
65012	Chemistry 1A	6cp
91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp

Stage 2

Spring semester

91313	Biochemistry 1	6cp
65022	Chemistry 2A	6cp
91702	Medical Science 2	6cp
68041	Physical Aspects of Nature	6cp

Stage 3

Autumn semester

91314	General Microbiology	6cp
91320	Biochemistry 2	6cp
91354	Anatomical Pathology	6cp
xxxxx	Elective/second major[1]	6cp

Stage 4

Spring semester

91326	Analytical Biochemistry	6cp
91330	Epidemiology and Public Health Microbiology	6cp
91132	Molecular Biology 1A	6cp
xxxxx	Elective/second major[1]	6cp

Stage 5

Autumn semester

	Choose at least two of the following Designated Biomedical Science electives	
91332	Molecular Biology 1	8cp
91338	Clinical Bacteriology	8cp
91344	Medical and Diagnostic Biochemistry	8cp
91130	Cytopathology Part A[2]	8cp
91358	Haematology 2	8cp
	plus	
xxxxx	Elective/second major[1]	6cp

[1] For details of electives recommended for the Biomedical Science degree, see table of Recommended electives for the Biomedical Science and Medical Science courses on page 93. Students can also choose electives/second majors from Designated Biomedical electives listed above.

[2] This subject will only be offered in block mode in Summer session 2002/3.

Stage 6

Spring semester

	Choose at least one of the following Designated Biomedical Science electives	
91345	Biochemistry, Genes and Disease	8cp
91129	Transfusion Science	8cp
91335	Molecular Biology 2	8cp
91359	Immunology 2	8cp
91352	Parasitology	8cp
91131	Cytopathology Part B[2]	8cp
	plus	
xxxxx	Elective/second major[1]	6cp

1 For details of electives recommended for the Biomedical Science degree, see table of Recommended electives for the Biomedical Science and Medical Science courses on page 93. Students can also choose electives/second majors from Designated Biomedical electives listed above.

2 This subject will only be offered in block mode in Summer session 2002/3.

Part-time program

Stage 1

Autumn semester

65012	Chemistry 1A	6cp
91701	Medical Science 1	6cp

Spring semester

65022	Chemistry 2A	6cp
91702	Medical Science 2	6cp

Stage 2

Autumn semester

33116	Statistical Design and Analysis	6cp
91101	Cells, Genetics and Evolution	6cp

Spring semester

91313	Biochemistry 1	6cp
xxxxx	Elective/second major[1]	6cp

Stages 3 and 4 — in 2003 and odd years[2]

Autumn semester

91314	General Microbiology	6cp
91354	Anatomical Pathology	6cp

Spring semester

91330	Epidemiology and Public Health Microbiology	6cp
	or	
91351	Immunology 1	3cp
91355	Haematology 1	3cp
xxxxx	Elective/second major[1]	6cp

Stages 3 and 4 — in 2004 and even years[2]

Autumn semester

91320	Biochemistry 2	8cp
xxxxx	Elective/second major[1]	6cp

Spring semester

91132	Molecular Biology 1A	6cp
	or	
91326	Analytical Biochemistry	6cp
xxxxx	Elective/second major[1]	6cp

Stage 5

Autumn semester

	Choose at least two of the following Designated Biomedical Science electives	
91332	Molecular Biology 1	8cp
91338	Clinical Bacteriology	8cp
91344	Medical and Diagnostic Biochemistry	8cp
91130	Cytopathology Part A[3]	8cp
91358	Haematology 2	8cp

Spring semester

	Choose at least one of the following Designated Biomedical Science electives	
91345	Biochemistry, Genes and Disease	8cp
91129	Transfusion Science	8cp
91335	Molecular Biology 2	8cp
91359	Immunology 2	8cp
91352	Parasitology	8cp
91131	Cytopathology Part B[3]	8cp

Stage 6

Autumn semester

xxxxx	Electives/second major[1]	8cp

Spring semester

xxxxx	Electives/second major[1]	16cp

1 For details of electives recommended for the Biomedical Science degree, see table of Recommended electives for the Biomedical Science and Medical Science courses on page 93. Students can also choose from Designated Biomedical electives listed in Stage 5.

2 The order in which part-time students undertake Stage 3, 4, 5 and 6 subjects, is determined by the fact that subjects are offered in appropriate time slots in alternate years only. Students entering the program in even and odd years will take their preferred combination of subjects in a different sequence.

3 This subject will only be offered in block mode in Summer session 2002/3.

Recommended subject strands

To fulfil the requirements of Stages 5 and 6 of the Biomedical Science degree course, students must complete at least two Designated Biomedical Science electives in Stage 5 and one in Stage 6 (or equivalent part-time Stages), totalling a minimum of 24 credit points, plus another 24 credit points of electives/second major subjects which may be drawn from the recommended biomedical science electives or from another part of the Faculty or elsewhere in the University. The following combinations constitute a cohesive strand of study in a particular discipline or related disciplines.

Biochemistry and Molecular Biology strand

Stage 5

91332	Molecular Biology 1	8cp
91344	Medical and Diagnostic Biochemistry	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

Stage 6

91335	Molecular Biology 2	8cp
91345	Biochemistry, Genes and Disease	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

Microbiology strand

Stage 5

91338	Clinical Bacteriology	8cp
91332	Molecular Biology 1	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

Stage 6

91352	Parasitology	8cp
91359	Immunology 2	8cp
	or	
91368	Bioreactors and Bioprocessing	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

[1] For list of Designated Biomedical Science electives see table of Recommended electives for the Biomedical Science and Medical Science courses on page 93 (denoted 'D').

[2] This subject will only be offered in block mode in Summer session 2002/3.

Pathology strand

Stage 5

91358	Haematology 2	8cp
91130	Cytopathology Part A[2]	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

Stage 6

91129	Transfusion Science	8cp
91131	Cytopathology Part B[2]	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

[1] For list of Designated Biomedical Science electives see table of Recommended electives for the Biomedical Science and Medical Science courses on page 93 (denoted 'D').

[2] This subject will only be offered in block mode in Summer session 2002/3.

Immunology and Molecular Biology strand

Stage 5

91332	Molecular Biology 1	8cp
xxxxx	Designated Biomedical Science elective[1]	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

Stage 6

91335	Molecular Biology 2	8cp
91359	Immunology 2	8cp
	plus	
xxxxx	Elective/second major[1]	8cp

[1] For a list of Designated Biomedical Science electives see table of Recommended electives for the Biomedical Science and Medical Science courses on page 93 (denoted 'D').

[2] This subject will only be offered in block mode in Summer session 2002/3.

AIMS Accredited Program of Study

Students wishing to meet the requirements for membership of the Australian Institute of Medical Scientists (AIMS) should select 91351 Immunology 1 and 91355 Haematology 1 as Stage 4 electives, and select all Stage 5 and 6 electives from the list of Designated Biomedical Science electives (denoted 'D' in the table of Recommended electives for the Biomedical Science and Medical Science courses on page 93).

Recommended electives for the Biomedical Science and Medical Science courses

Subject number	Subject name	Credit points	Semester offered	Recommended stage for subject[1] Biomedical Science	Medical Science
68041	Physical Aspects of Nature	6	A or S	C	2
91703	Physiological Systems	6	A	3	C
91142	Biotechnology	6	A	3	NR
91314	General Microbiology	6	A	C	3
91354	Anatomical Pathology	6	A	C	3
91351	Immunology 1	3	S	4	4
91355	Haematology 1	3	S	4	4
91320	Biochemistry 2	6	A	C	3
91326	Analytical Biochemistry	6	S	C	4
91330	Epidemiology and Public Health Microbiology	6	S	C	4
91132	Molecular Biology 1A	6	S	C	4
91344	Medical and Diagnostic Biochemistry	8	A	D5 e	5
91358	Haematology 2	8	A	D5 o	5
91338	Clinical Bacteriology	8	A	D5 e	5
91130	Cytopathology Part A[2]	8	Summer (block mode)	D5	5
91369	Biobusiness and Environmental Biotechnology	8	A	5	NR
91706	Neuroscience	8	A	5	C
91707	Pharmacology 1	8	A	5	C
91332	Molecular Biology 1	8	A	D5 o	5
91335	Molecular Biology 2	8	S	D6 o	6
91345	Biochemistry, Genes and Disease	8	S	D6 e	6
91129	Transfusion Science	8	S	D6 o	6
91352	Parasitology	8	S	D6 o	6
91359	Immunology 2	8	S	D6 e	6
91131	Cytopathology Part B[2]	8	Summer (block mode)	D6 e	6
91368	Bioreactors and Bioprocessing	8	S	6	NR
91709	Pharmacology 2	8	S	6	C
91398	Special Reading Assignment – Life Sciences[3]	4	A and S	5 or 6	5 or 6
91399	Individual Project – Life Sciences[3]	8	A and S	5 or 6	NR
xxxxx	Miscellaneous elective[4]	4/8	A and S	5 or 6	5 or 6
69323	Human Factors/Ergonomic Design	3	A or S[5]	NR	3
69312	Occupational Hazard Analysis	6	A	NR	3
69338	Biological Hazards and Toxicology	3	A or S[5]	NR	3 or 4
69336	Evaluating Occupational Health and Safety (Construction Industry)	6	A or S[5]	NR	3 or 4
69341	Risk Management	6	A or S[5]	NR	3 or 4
69332	Chemical Safety (Management)	3	S	NR	4
69335	People and the Physical Environment	3	S	NR	4
69342	Legal Aspects of Occupational Health and Safety	3	S	NR	4
69345	Occupational Health and Safety Management	6	S	NR	4

A = Autumn semester **S** = Spring semester **Y** = Full-year subject **C** = Core subject for that course
D = Designated elective for Biomedical Science (At least 24 credit points of these subjects are required for this degree.)
NR = Not recommended

1 The Stage 5 and 6 subjects marked (o) will run in part-time mode in odd years only; those marked (e) will run in part-time mode in even years only. All electives are offered in full-time mode every year.

2 This subject will only be offered in block mode in Summer session 2002/3.

3 Supervision form must be completed and approved by the relevant Course Director.

4 This may include subjects from other courses within the biological and biomedical sciences, subjects from another UTS school or faculty, or subjects from another university undertaken on a concurrent study basis, e.g. Viruses and Disease at University of NSW. Appropriate subjects from other universities may be counted as designated 3rd year electives for Biomedical Science if approved by the Course Director. For recommended science strands see page 143.

5 These subjects are offered in different semesters in some years.

Note: Subjects recommended for particular stages may be undertaken by part-time students when programmable, provided the prerequisites are met. Owing to timetable constraints, not all electives may be available to students in any given semester.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to research work in biomedical science. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information see Bachelor of Science (Honours) in Biomedical Science (C09023) on page 118.

Professional recognition

Graduates of this course who have completed studies in relevant clinical areas (see Recommended subject strands above) are eligible for membership of the Australian Institute of Medical Scientists (AIMS).

Other information

All academic inquiries should be made to:

Course Director, Biomedical Science
Dr Mary Davey
Department of Cell and Molecular Biology
telephone (02) 9514 4065
fax (02) 9514 4026
email Mary.Davey@uts.edu.au

Bachelor of Biotechnology

- UTS course code: C10172 (pre-2003: NA01)
- UAC code: 607001
- Testamur title: Bachelor of Biotechnology
- Abbreviation: BBiotech
- Course Director: Associate Professor Kevin Broady
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points:144

Overview

The UTS Bachelor of Biotechnology provides students with a professional qualification in biological science with emphasis on DNA technology and its applications, and a firm basis in the industrial aspects of biotechnology. The course involves a thorough grounding in biochemistry, microbiology, immunology and molecular biology; these being the principal areas that together comprise the multidisciplinary science that we now term 'biotechnology'. The methods of biotechnology find application in almost every area of biological and medical science. For example, areas as diverse as the development of new vaccines and therapeutic substances, improving the quality of foods and beverages, pest control in agriculture, and studies of the causation of cancer, all make use of the methods of biotechnology. Major areas of study include food, agricultural, environmental and medical biotechnology.

Electives may be taken from a wide range of areas offered within the Faculty of Science (see pages 143–151) or within the University. See the Elective options for the Biotechnology course table on page 98, the Second majors section on page 146, or the Course Director for more details. Students are encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field (see page 56).

1 The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional biotechnologists with highly adaptable and practical scientific skills, accompanied by a thorough grounding in theory. Graduates can expect to find employment in a range of areas including food, beverage, chemical, pharmaceutical and fermentation industries, particularly in production, quality control, or research and development areas. These industries depend on a high level of professional competence in standard techniques of microbiology and biochemistry. An increasing number of products involve the application of some of the molecular or other aspects of biotechnology in their manufacture. Good employment opportunities also exist with State and federal government scientific instrumentalities, and in research and other laboratories in tertiary institutions, hospitals and industry. In recent years a number of smaller, specialised development and consulting companies have developed from biotechnology research programs. These organisations require graduates with a strong grounding in biotechnology and applied microbiology. Many employers in the biotechnology field, being themselves active in research and development, have close links with tertiary education institutions, and can offer graduates the possibility of higher degree studies in conjunction with employment.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English and at least one science subject, preferably Mathematics Extension 1 and Chemistry. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

This course is offered over:

- three years, full time
- six years, part time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

Subjects are divided into core subjects and elective or second major subjects. For the award of the degree, students must satisfactorily complete all core subjects and 28 credit points of elective or second major subjects. Elective subjects may be combined to form a cohesive strand comprising either subjects allied to biotechnology or a second major in a field of interest to the student. Examples of appropriate combinations of elective/second major subjects are given following the course program outline (see page 97). The second major may consist entirely of subjects chosen from the Elective options for the Biotechnology course table on page 98, or other subjects from the Faculty of Science (see pages 143–151). Some students may wish to undertake subjects from other faculties or institutes of UTS or from other universities. The Biotechnology Course Director can advise students on selection of second majors and electives.

Course program

Full-time program

Stage 1

Autumn semester

33116	Statistical Design and Analysis	6cp
65012	Chemistry 1A	6cp
91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp

Stage 2

Spring semester

65022	Chemistry 2A	6cp
91702	Medical Science 2	6cp
68041	Physical Aspects of Nature[1]	6cp
91313	Biochemistry 1	6cp

Stage 3

Autumn semester

91320	Biochemistry 2	6cp
91314	General Microbiology	6cp
91142	Biotechnology	6cp
xxxxx	Elective/second major	6cp

Stage 4

Spring semester

91132	Molecular Biology 1	6cp
91326	Analytical Biochemistry	6cp
91351	Immunology 1	3cp
91128	Plant Biotechnology	3cp
xxxxx	Electives[1]/second major	6cp

Stage 5

Autumn semester

91335	Molecular Biology 2	8cp
91369	Biobusiness and Environmental Biotechnology	8cp
xxxxx	Electives[1]/second major	8cp

Stage 6

Spring semester

91368	Bioreactors and Bioprocessing	8cp
xxxxx	Electives/second major	16cp

[2] See Elective options for the Biotechnology course table on page 98 for details of suitable electives offered by the Faculty of Science (refer to pages 143–151).

Part-time program

Stage 1

Autumn semester

65012	Chemistry 1A	6cp
91701	Medical Science 1	6cp

Spring semester

65022	Chemistry 2A	6cp
91702	Medical Science 2	6cp

Stage 2

Autumn semester

33116	Statistical Design and Analysis	6cp
91101	Cells, Genetics and Evolution	6cp

Spring semester

91313	Biochemistry 1	6cp
68041	Physical Aspects of Nature	6cp

Stages 3 and 4 – in 2003 and odd years

Autumn semester

91314	General Microbiology	6cp
91142	Biotechnology	6cp

Spring semester

91351	Immunology 1	3cp
91128	Plant Biotechnology	3cp
xxxxx	Electives[1]/second major	6cp

Stages 3 and 4 – in 2004 and even years

Autumn semester

91320	Biochemistry 2	6cp
xxxxx	Elective/second major	6cp

Spring semester

91132	Molecular Biology 1	6cp
91326	Analytical Biochemistry	6cp

or

Stage 5

Autumn semester

91335	Molecular Biology 2	8cp
xxxxx	Electives[1]/second major	8cp

Spring semester

xxxxx	Electives[1]/second major	8cp

Stage 6

Autumn semester

91369	Biobusiness and Environmental Biotechnology	8cp

Spring semester

91368	Bioreactors and Bioprocessing	8cp
xxxxx	Electives[1]/second major	8cp

[1] See Elective options for the Biotechnology course table on page 98 for details of suitable electives offered by the Faculty of Science (refer to pages 143–151).

Note: Some core subjects and electives for part-time students are offered in alternate years only. Students entering the program in odd and even years will take their core subjects and electives in a different sequence. The order in which part-time students undertake Stage 3, 4, 5 and 6 subjects is determined by the fact that subjects are offered in appropriate time slots in alternate years only.

Recommended subject strands

Each student chooses 36 credit points of electives which may be drawn from the Elective options for the Biotechnology course table on page 98, from another part of the Faculty, from other faculties in the University or from other universities by an approved concurrent study program. A variety of subject combinations may be chosen, appropriate to a wide range of career options. Some examples of elective groupings are given below.

Medical Biotechnology (Immunology or Microbiology)

91703	Physiological Systems	6cp
91330	Epidemiology and Public Health Microbiology	6cp
91338	Clinical Bacteriology	8cp
91359	Immunology 2	8cp
	or	
91352	Parasitology	8cp
	or	
UNSW	Viruses and Disease	8cp

Medical Biotechnology (Biochemistry or Pharmacology)

91703	Physiological Systems	6cp
91330	Epidemiology and PublicHealth Microbiology	6cp
91344	Medical and Diagnostic Biochemistry	8cp
	or	
91707	Pharmacology 1	8cp
91345	Biochemistry, Genes and Disease	8cp
	or	
91709	Pharmacology 2	8cp

Plant Biotechnology

91233	Plant Production and Growing Systems	6cp
91237	Plant Pathology	6cp
91270	Plant Physiology	6cp
91249	Plant Population Genetics and Biodiversity	6cp
xxxxx	Other elective	4cp

Environmental Biotechnology

91111	Pollution Assessment	6cp
91121	Aquatic Ecology	6cp
91114	Toxicity Assessment	6cp
91113	Pollution Ecology	6cp
	or	
91117	Freshwater Ecology	6cp
xxxxx	Other elective	4cp

In addition, a number of the optional second majors, listed separately in this handbook provide appropriate study programs to be taken in conjunction with the Biotechnology degree course. The following second majors may be worthy of consideration for Biotechnology students having specific career interests (refer to page 146 for more information):

- Neurophysiology
- Small and Medium Enterprise Management
- Public Communication.

It should be noted that timetable constraints might prevent the undertaking of some combinations of core and elective subjects in a particular semester. The inclusion of subjects presented by another faculty or at a different campus requires close attention to timetabling.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Other information

All academic inquiries should be made to:

Course Director, Biotechnology
Associate Professor Kevin Broady
Department of Cell and Molecular Biology
telephone (02) 9514 4101
fax (02) 9514 4026
email Kevin.Broady@uts.edu.au

Elective options for the Biotechnology course (Biological, Biomedical and Environmental Science subjects)

Subject number	Subject name	Credit points	Semester offered	Recommended stage for subject[1]
91102	Functional Biology	6	S	2
91703	Physiological Systems	6	A	3
91111	Pollution Assessment	6	A	3
91233	Plant Production and Growing Systems	6	A	3
91330	Epidemiology and Public Health Microbiology	6	S	4 o
91704	Behavioural Sciences	6	S	4
91237	Plant Pathology	6	S	4
91121	Aquatic Ecology	6	A	5
91270	Plant Physiology	6	A	3 or 5
91338	Clinical Bacteriology	8	A	5 e
91707	Pharmacology 1	8	A	5
91706	Neuroscience	8	A	5
91344	Medical and Diagnostic Biochemistry	8	A	5 e
91114	Toxicity Assessment	6	S	6
91117	Freshwater Ecology	6	S	6
91249	Plant Population Genetics and Biodiversity	6	S	6
91113	Pollution Ecology	6	S	6
91352	Parasitology	8	S	6 o
91359	Immunology 2	8	S	6 e
91709	Pharmacology 2	8	S	6
91345	Biochemistry, Genes and Disease	8	S	6 e
91708	Psychophysiology	8	S	6
91122	Environmental Management	6	S	6
91398	Special Reading Assignment – Life Sciences[2]	4	A and S	5 or 6
91399	Individual Project – Life Sciences[2]	8	A and S	5 or 6
xxxxx	Miscellaneous elective[3]	4/6/8	A and S	3–6

A = Autumn semester S = Spring semester

1 The subjects marked (o) will run in part-time mode in odd years only; those marked (e) will run in part-time mode in even years only. All electives are offered in full-time mode every year.

2 Supervision form must be completed and approved by the relevant Course Director.

3 This may include subjects from other courses within the biological and biomedical sciences, subjects from another UTS school or faculty, or subjects from another university undertaken on a concurrent study basis, e.g. Viruses and Disease at University of NSW.

Note: Subjects recommended for particular stages may be undertaken by part-time students when programmable, provided the prerequisites are met. Owing to timetable constraints and student numbers, not all electives may be available to students in any given semester.

Bachelor of Biotechnology Innovation[1,2]

- UTS course code: C10173 (pre-2003: NA04)
- UAC code: 607002
- Testamur title: Bachelor of Biotechnology Innovation
- Abbreviation: BBiotechIn
- Course Director, Innovation Programs: Associate Professor Graeme Sheather
- Course Director, Biotechnology: Associate Professor Kevin Broady
- Course fee: HECS (local)
- Total credit points: 144

Overview

The Bachelor of Biotechnology Innovation is one of four related technology innovation courses offered at UTS. The innovation program embodies a transdisciplinary team-based approach to course curriculum and delivery and offers students the opportunity to develop knowledge and skills in biotechnology and the know-how to apply this knowledge in the context of any organisation. Students study across the major areas of biotechnology and molecular biosciences, learning how to develop and commercialise new technologies and initiatives. The course combines the study of science with the key ideas of innovation, business, capital management and sustainability, and students learn the fundamentals of making ideas work.

Course aims

The overall course aim is to combine an in-depth study of biotechnology with the knowledge of how to develop and commercialise new technologies and initiatives in the biotechnology industries.

The entrepreneurial component of the program aims to equip students with an entrepreneurial attitude and appropriate business skills to transform new ideas, knowledge and technologies into new products and processes. This enables graduates to bring to industry a greatly improved capacity to manage risk and to create an environment conducive to innovation.

The science component of the program aims to provide a sound education in biotechnology for students who intend to make a career in the profession, as well as providing a pathway to Honours, postgraduate study and a research career. Graduates are committed to lifelong learning built on the foundations provided by their course of study.

The course provides a sound study of science and its applications together with related business skills that enable graduates to take a leading role in the entrepreneurial activities of an organisation. Graduates are also equipped to start up their own companies.

Admission requirements

This course is only offered to Australian students who are recent school leavers. The number of students admitted each year is limited to a strict quota based on the availability of resources.

For local recent school leavers, selection into the course is based on the HSC UAI or equivalent. There are no prerequisites for entry, however, the assumed knowledge is Mathematics Extension 1, Chemistry and any two units of English. As students commence their studies in science at an intermediate level in this course, applicants that do not meet assumed knowledge requirements are strongly recommended to do a relevant bridging course. Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). Applications are taken from September to December each year.

Advanced standing

Due to the special nature of this course, and the acceptance of only recent school leaver applications, no advanced standing for previous study is possible.

Attendance

Full-time attendance during Spring and Autumn semesters involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester.

Course duration

The Bachelor of Biotechnology Innovation is three years, full time. The course consists of six academic semesters of full-time study, and

1 At the time of printing, the Innovation program is yet to be finalised and may be subject to change. Consult the online handbook for the latest information at:

www.uts.edu.au/div/publications/sci/index.html

2 This course is not offered to international students and non-recent school leavers.

a minimum period of eight weeks of industry experience. Suitably qualified students are able to apply to undertake and additional year of Honours study (see page 118). This course is not offered in part-time mode.

Course structure

The Bachelor of Biotechnology Innovation requires students to complete 144 credit points of subjects, divided into two streams: the Disciplinary Stream and the Entrepreneurial Stream. The Disciplinary Stream consists of 88 credit points of biotechnology subjects (see page 98 for electives). The Entrepreneurial Stream consists of 56 credit points of subjects introducing basic concepts in entrepreneurship, innovation, information technology, business and sustainability. Also in the Entrepreneurial Stream, students undertake a 6-credit-point Capstone Project, which involves drawing on scientific, innovation, and venture capital expertise in the University and its partners. Subjects in the Entrepreneurial Stream are drawn from several faculties. Recommended science strands can be found on page 143.

Industrial experience

Students normally undertake a minimum of eight weeks of entrepreneurial experience in the Summer session between the second and third years of study. Students are linked with industry partners who provide industrial experience in the biotechnology industry in an environment conducive to innovation and entrepreneurship. The goal is to provide a period of targeted industrial experience that is structured to link with the subjects studied at university and to reinforce students' learning in a workplace setting. Specific arrangements for entering the entrepreneurial experience will be published by the Faculty of Science in 2003.

Course program

Full-time program

Stage 1

Autumn semester

D	91314	General Microbiology	6cp
D	65012	Chemistry 1A[1]	6cp
E	xxxxx	IT Fundamentals	6cp
E	24108	Marketing Foundations	6cp

Stage 2

Spring semester

D	65022	Chemistry 2A[1]	6cp
D	91313	Biochemistry 1	6cp
E	48210	Engineering for Sustainability	6cp
E	22107	Accounting for Business	6cp

Stage 3

Autumn semester

D	91142	Biotechnology	6cp
D	91320	Biochemistry 2	6cp
E	25559	New Start Financing and Valuation	6cp
E	24307	Electronic Business	6cp

Stage 4

Spring semester

D	91132	Molecular Biology 1	6cp
D	91326	Analytical Biochemistry	6cp
D	91351	Immunology 1	3cp
D	91128	Plant Biotechnology	3cp
E	21193	Introduction to Corporate Strategy	6cp

Entrepreneurial experience

Summer session

Students normally undertake a minimum of eight weeks' industrial experience during this period.

Stage 5

Autumn semester

D	xxxxx	Technical Project	4cp
D	91335	Molecular Biology 2	8cp
D	91369	Biobusiness and Environmental Biotechnology	8cp
E	21227	Innovation and Small Venture Management	6cp

D = Disciplinary Stream subject
E = Entrepreneurial Stream subject

[1] The Course Director, Biotechnology may allow a student to enrol in 911101 Cells, Genetics and Evolution or 91701 Medical Science 1 in place of 65012 Chemistry 1A; and 91702 Medical Science 2 in place of 65022 Chemistry 2A, depending on the student's prior knowledge.

Stage 6

Spring semester

D	91368	Bioreactors and Bioprocessing	8cp
E	2xxxx	Capstone Project (Business Planning)	6cp
D	xxxxx	Biotechnology elective	8cp

D = Disciplinary Stream subject
E = Entrepreneurial Stream subject

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to research work in biotechnology. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information consult the Course Director and refer to page 111.

Other information

All academic inquiries should be made to:

Director, Innovation Programs
Associate Professor Graeme Sheather
Faculty of Business
telephone (02) 9514 5442
fax (02) 9514 5583
email Graeme.Sheather@uts.edu.au

Course Director, Biotechnology
Associate Professor Kevin Broady
Department of Cell and Molecular Biology
telephone (02) 9514 4101
fax: (02) 9514 4026
email Kevin.Broady@uts.edu.au

Bachelor of Science in Environmental Biology

- UTS course code: C10117 (pre-2003: KB05)
- UAC code: 607023
- Testamur title: Bachelor of Science in Environmental Biology
- Abbreviation: BSc
- Course Director: Dr Alex Pulkownik
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

This course provides a degree in biological and environmental science and the technological skills to tackle complex environmental problems, such as an ability to apply sampling and measurement methods for such purposes as pollution monitoring, or the preparation of environmental assessments, etc. After foundation studies in the basic sciences, students specialise in the ecology and physiology of plants and animals, and in freshwater, marine and terrestrial ecosystems. Several non-compulsory specialised second majors are available (see Course structure below).

During their studies, students have the opportunity to take part in field trips to many parts of eastern Australia, for example, north and south coast areas, Snowy Mountains, Murrumbidgee Irrigation Area, the far west, Jervis Bay and Heron Island. Students should note, however, that excursions for field study elective subjects may be held in the weeks prior to semester and in other non-teaching weeks of the year, including weekends. The major field trips are elective subjects listed separately below. The timetable for field trips scheduled to run in 2003 will be available prior to enrolment in late 2002.

Course aims

This course aims to produce professional environmental scientists with highly adaptable and practical scientific and field skills accompanied by a thorough grounding in theory. Graduates can expect to find employment as scientific officers with government agencies such as Sydney Water; Environment Protection Authority; Departments of Urban Affairs and Planning, Land and Water Conservation, and Fisheries; National Parks and Wildlife Service; museums and herbaria. They may also find employment with local government authorities; as technical and research officers with universities and colleges; as environmental consultants, or environmental, toxicological or biological scientists in private enterprise. Many organisations provide opportunities for graduates to undertake research projects for a higher degree in the Faculty.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English and at least one science subject, preferably Mathematics Extension 1 and Chemistry. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

This course is offered over:

- three years, full time
- six years, part time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. Contact the Course Director for advice.

Course structure

The course consists of six academic stages but may include a period of industrial training that extends the minimum completion time to four years leading to the additional award of Diploma in Scientific Practice (see page 56). The Environmental Biology degree is divided into a major area of study, consisting of core environmental biology (72 credit points) (see page 144) and core support subjects (mathematics, statistics, computing and chemistry) (30 credit points), and a second major or other elective area of study (42 credit points) which can constitute a second major (see page 146).

For students wanting a greater focus in their major in environmental biology, there are four specialist second majors available: Pollution Ecology, Wildlife Ecology, Freshwater Ecology or Coastal and Marine Sciences. The subject program for each of these is indicated below. Students should be aware that second majors in other science degree programs (see page 146), or any combination of subjects from within the University, can alternatively be studied to complete the 42 credit points outside the major area. Elective subjects can be chosen from any program elsewhere within the Department, Faculty or University, provided students can satisfy the prerequisites. Information on prerequisites and subject timetables, etc., can be found in the Subject Descriptions section.

Course program

Full-time major program

Stage 1

Autumn semester

33116	Statistical Design and Analysis	6cp
65012	Chemistry 1A	6cp
91101	Cells, Genetics and Evolution	6cp
xxxxx	Elective/second major	6cp

Stage 2

Spring semester

33101	Mathematics 1 (Life Sciences)	3cp
65022	Chemistry 2A	6cp
91102	Functional Biology	6cp
91395	Biocomputing	3cp
xxxxx	Elective/second major	6cp

Stage 3

Autumn semester

91110	Experimental Design and Sampling	6cp
91111	Pollution Assessment	6cp
91270	Plant Physiology	6cp
xxxxx	Elective/second major	6cp

Stage 4

Spring semester

91112	Ecological Principles and Modelling	6cp
91309	Australian Biota	6cp
91363	Animal Ecophysiology	6cp
xxxxx	Elective/second major	6cp

Stage 5

Autumn semester

91119	Terrestrial Ecosystems	6cp
91120	Mapping and Remote Sensing	6cp
91121	Aquatic Ecology	6cp
xxxxx	Elective/second major	6cp

Stage 6

Spring semester

91122	Environmental Management	6cp
79004	Environmental Law and Science	6cp
xxxxx	Elective/second major	6cp
xxxxx	Elective/second major	6cp

Part-time major program

Stage 1

Autumn semester

65012	Chemistry 1A	6cp
91101	Cells, Genetics and Evolution	6cp

Spring semester

65022	Chemistry 2A	6cp
91102	Functional Biology	6cp

Stage 2

Autumn semester

33116	Statistical Design and Analysis	6cp
xxxxx	Elective/second major	6cp

Spring semester

33101	Mathematics 1 (Life Sciences)	3cp
91395	Biocomputing	3cp
xxxxx	Elective/second major	6cp

Stage 3

Autumn semester

91110	Experimental Design and Sampling	6cp
91270	Plant Physiology	6cp

Spring semester

91112	Ecological Principles and Modelling	6cp
91309	Australian Biota	6cp

Stage 4

Autumn semester

91111	Pollution Assessment	6cp
xxxxx	Elective/second major	6cp

Spring semester

91363	Animal Ecophysiology	6cp
xxxxx	Elective/second major	6cp

Stage 5

Autumn semester

91119	Terrestrial Ecosystems	6cp
91120	Mapping and Remote Sensing	6cp

Spring semester

79004	Environmental Law and Science	6cp
91122	Environmental Management	6cp

Stage 6

Autumn semester

91121	Aquatic Ecology	6cp
xxxxx	Elective/second major	6cp

Spring semester

xxxxx	Electives/second major	12cp

Full-time electives/second major in Pollution Ecology

Stage 1

Autumn semester

66101	Earth Science 1	6cp
	or	
68041	Physical Aspects of Nature	6cp
	or	
91246	Plant Structure, Function and Culture	6cp

Stage 2

Spring semester

66204	Field Studies 1	6cp
	or	
68041	Physical Aspects of Nature	6cp
	or	
68201	Physics in Action (Physics 2)	6cp

Stage 3

Autumn semester

65621	Environmental Chemistry	6cp

Stage 4

Spring semester

91114	Toxicity Assessment[1]	6cp

Stage 5

Autumn semester

xxxxx	Elective[2]	6cp

Stage 6

Spring semester

91113	Pollution Ecology	6cp
xxxxx	Elective[2]	6cp

1 This subject is next available in Spring semester 2003.

2 Students may choose any subject from within the Department, Faculty or University provided they meet the prerequisite and/or corequisite requirements.

Full-time electives/second major in Wildlife Ecology

Stage 1

Autumn semester

66101	Earth Science 1	6cp
	or	
68041	Physical Aspects of Nature	6cp
	or	
91246	Plant Structure, Function and Culture	6cp

Stage 2

Spring semester

66204	Field Studies 1	6cp
	or	
68041	Physical Aspects of Nature	6cp
	or	
68201	Physics in Action (Physics 2)	6cp

Stage 3

Autumn semester

xxxxx	Elective[1]	6cp

Stage 4

Spring semester

xxxxx	Elective[1]	6cp

Stage 5

Autumn semester

91116	Wildlife Ecology	6cp

Stage 6

Spring semester

91113	Pollution Ecology	6cp
	or	
91117	Freshwater Ecology	6cp
xxxxx	Elective[1]	6cp

1 Students may choose any subject from within the Department, Faculty or University provided they meet the prerequisite and/or corequisite requirements.

Full-time electives/second major in Freshwater Ecology

Stage 1

Autumn semester

66101	Earth Science 1	6cp
	or	
68041	Physical Aspects of Nature	6cp
	or	
91246	Plant Structure, Function and Culture	6cp

Stage 2

Spring semester

66204	Field Studies 1	6cp
	or	
68041	Physical Aspects of Nature	6cp
	or	
68201	Physics in Action (Physics 2)	6cp

Stage 3

Autumn semester

91118	Fisheries Resources[1]	6cp
	or	
xxxxx	Elective[2]	6cp

Stage 4

Spring semester

91114	Toxicity Assessment[3]	6cp

Stage 5

Autumn semester

91314	General Microbiology	6cp

Stage 6

Spring semester

91117	Freshwater Ecology	6cp
xxxxx	Elective[2]	6cp

[1] This subject is offered in Autumn semester in alternate years. Next available in Autumn 2004.

[2] This subject is next available in Spring semester 2003.

[3] Students may choose any subject from within the Department, Faculty or University provided they meet the prerequisite and/or corequisite requirements.

Full-time electives/second major in Coastal and Marine Sciences

Stage 1

Autumn semester

66101	Earth Science 1	6cp

Stage 2

Spring semester

66204	Field Studies 1	6cp

Stage 3

Autumn semester

91118	Fisheries Resources[1]	6cp

Stage 4

Spring semester

xxxxx	Elective	6cp

Stage 5

Autumn semester

98711	Management of Coasts, Oceans and Catchments[2]	6cp

Stage 6

Spring semester

xxxxx	Electives[3]	12cp

[1] This subject is offered in Autumn semester in alternate years. Next available in Autumn 2004.

[2] This subject is offered in Autumn semester in alternate years. Next available in Autumn 2003.

[3] Students may choose any subject from within the Department, Faculty or University provided they meet the prerequisite and/or corequisite requirements. However, students undertaking the electives/second major in Coastal and Marine Science are strongly recommended to enrol in 91124 Coastal and Marine Ecosystems and 91126 Coral Reef Ecosystems.

Elective field subjects in Environmental Science

66612	Geological Mapping	6cp
91124	Coastal and Marine Ecosystems	6cp
91126	Coral Reef Ecosystems	6cp
91370	Semi-arid Ecology	6cp
91371	Forest and Mountain Ecology	6cp
66036	Identifying Groundwater Dependent Ecosystems	6cp
66037	Ecosystem Vulnerability and Valuation	6cp
66038	Policies and Management for Groundwater Dependent Ecosystems	6cp
66039	Professional Practice (Environmental)	6cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, seminar presentations and reports based on field and laboratory work. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in geosciences. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information, contact the Course Director and refer to page 111.

Professional recognition

The Bachelor of Science in Environmental Biology is fully recognised for membership of the Australian Institute of Biology Inc. and fully qualifies graduates as biological scientists with specialisation in environmental science.

Other information

All academic inquiries, including requests for advice on subject and sub-major selection, exemptions and variations in program, should be made to:

Course Director, Environmental Biology
Dr Alex Pulkownik
Department of Environmental Science
telephone (02) 9514 4035
fax (02) 9514 4003, (02) 9514 4079
email Alex.Pulkownik@uts.edu.au

All students are encouraged to consult the departmental website:

www.science.uts.edu.au/des/des-home.html

Bachelor of Science in Nanotechnology

- UTS course code: C10170 (pre-2003: N014)
- UAC code: 607165
- Testamur title: Bachelor of Science in Nanotechnology
- Abbreviation: BSc
- Course Director: Associate Professor Mike Ford
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 144

Overview

The Bachelor of Science in Nanotechnology is designed to educate and train graduates for careers in the multidisciplinary field of nanotechnology, covering biological, chemical and physical processes at the micro-and nanoscale. Major areas of study include nanoscale sensors, devices, machines, optics, nanotubes, and nanomaterials. Emphasis is placed on industrial applications of this fast growing science, and students gain an understanding of the principles of nanotechnology, imaging and manipulation at the nanometre scale, and acquire valuable practical skills. Many applications of nanotechnology will benefit society in practical ways such as: reductions in manufacturing costs; reduced dependence on fossil fuels and environmental pollution; and improved medical and environmental technologies.

Minor studies or electives may be undertaken in a wide range of areas offered within the Faculty of Science or within the University. See the Second majors section of this handbook (see page 146) or contact the Course Director for more details. Students are encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field (see page 56).

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

This course aims to produce professional scientists with highly adaptable and practical scientific skills, accompanied by a thorough grounding in theory. Graduates can expect to find employment in a range of areas including research positions in: the development of patterned monolayers for a new generation of chemical and biological sensors; switching devices to improve computer storage capacity by a factor of a million; tiny medical probes that will not damage tissues; and entirely new drug and gene therapy systems and materials with greatly improved mechanical properties. Graduates also qualify for technical positions in manufacturing, quality control, sales and marketing of technical products.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC Mathematics, English, Physics and Chemistry, preferably Mathematics Extension 1. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, they may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

This course is offered over:

- three years, full time
- four years, full time with successful completion of the Diploma in Scientific Practice, or
- four years, full time with Honours.

Other patterns of attendance may also be permitted. For advice, contact the Course Director.

Course structure

This degree is structured to develop strong multidisciplinary skills in nanotechnology.

Course program[1]

Stage 1

Autumn semester

65101	Chemistry 1C	6cp
33190	Mathematical Modelling for Science	6cp
60103	Nanosciences 1	6cp
68101	Foundations of Physics	6cp

Stage 2

Spring semester

65201	Chemistry 2C	6cp
33290	Computing and Mathematics for Science	6cp
60104	Nanosciences 2	6cp
68201	Physics in Action (Physics 2)	6cp

Stage 3

Autumn semester

60xxx	Scanned Probe and Electron Microscopy	6cp
65307	Physical Chemistry 1	6cp
68xxx	Imaging Science	6cp
33xxx	Mathematics for Physical Sciences	6cp

Stage 4

Spring semester

60xxx	Nanomaterials	6cp
91313	Biochemistry 1	6cp
60xxx	Quantum Technology	6cp
xxxxx	Approved second major/elective	6cp

[1] At the time of printing, the final course program for Stages 3, 4, 5 and 6 has yet to go to Faculty Board. Consult the online handbook for the Faculty of Science for the latest information at:

www.uts.edu.au/div/publications/sci/index.html

Stage 5

Autumn semester

xxxxx Approved Nanotechnology subjects 24cp

Stage 6

Spring semester

xxxxx Approved Nanotechnology subjects 24cp

Recommended subject strands

Students may choose electives from Nanotechnology electives (see below) or relevant subjects from the Faculty of Science or other Faculty with approval from the Course Director.

Nanotechnology electives

At the time of printing, the nanotechnology electives are yet to go to Faculty Board. Consult the online handbook for the Faculty of Science for the latest information at:

www.uts.edu.au/div/publications/sci/index.html

Nanotechnology electives will include the following subject areas: Quantum Technology, Advanced Nanocharacterisation and Nanomanipulation, Molecular Devices, Molecular Modelling Methods, Molecular Biology, Transduction of Physical Stimuli by Organisms, Nanosensors and Biosensors, and Nanoengineering and Nanophotonics.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details of individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in medical science. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information, contact the Course Director.

Other information

All academic inquiries should be made to:

Course Director
Associate Professor Mike Ford
telephone (02) 9514 7956
fax (02) 9514 7553
email Mike.Ford@uts.edu.au

Bachelor of Science in Nanotechnology Innovation[1,2]

- UTS course code: C10171 (pre-2003: N015)
- UAC code: 607170
- Testamur title: Bachelor of Science in Nanotechnology Innovation
- Abbreviation: BScNanoIn
- Course Director, Innovation Programs: Associate Professor Graeme Sheather
- Course Director, Nanotechnology: Associate Professor Mike Ford
- Course fee: HECS (local)
- Total credit points: 144

Overview

The Bachelor of Science in Nanotechnology Innovation is one of four related technology innovation courses offered at UTS. The innovation program embodies a transdisciplinary team-based approach to course curriculum and delivery and offers students the opportunity to develop knowledge and skills in nanotechnology and the know-how to apply this knowledge in the context of any organisation. Students study across the major areas of nanosciences and nanotechnology, learning how to develop and commercialise new technologies and initiatives. The course combines the study of science with the key ideas of innovation, business, capital management and sustainability, and students learn the fundamentals of making ideas work.

Course aims

The overall course aim is to combine an in-depth study of nanotechnology with the knowledge of how to develop and commercialise new technologies and initiatives in nano-based sciences.

The entrepreneurial component of the program aims to equip students with an entrepreneurial attitude and appropriate business skills to transform new ideas, knowledge and technologies into new products and processes. This enables graduates to bring to industry a greatly improved capacity to manage risk and to create an environment conducive to innovation.

The science component of the program aims to provide a sound education in nanotechnology for students who intend to make a career in the profession, as well as providing a pathway to Honours, postgraduate study and a research career. Graduates are committed to lifelong learning built on the foundations provided by their course of study.

The course provides a sound study of science and its applications together with related business skills that enable graduates to take a leading role in the entrepreneurial activities of an organisation. Graduates are also equipped to start up their own companies.

Admission requirements

This course is only offered to Australian students who are recent school leavers. The number of students admitted each year is limited to a strict quota based on the availability of resources.

For local recent school leavers, selection into the course is based on the HSC UAI or equivalent. There are no prerequisites for entry, however, the assumed knowledge is Mathematics Extension 1, Physics, Chemistry and any two units of English. As students commence their studies in science at an intermediate level in this course, applicants that do not meet assumed knowledge requirements are strongly recommended to do a relevant bridging course.

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). Applications are taken from September to December each year.

Attendance

Full-time attendance during Spring and Autumn semesters involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester.

Advanced standing

Due to the special nature of this course, and the acceptance of only recent school leaver applications, no advanced standing for previous study is possible.

Course duration

Bachelor of Science in Nanotechnology Innovation is three years, full time. The course

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1 At the time of printing, the Innovation program is yet to be finalised and may be subject to change. Consult the online handbook for the latest information at:
www.uts.edu.au/div/publications/sci/index.html

2 This course is not offered to international students and non-recent school leavers.

consists of six academic semesters of full-time study, and a minimum period of eight weeks of industry experience. Suitably qualified students are able to apply to undertake and additional year of Honours study (see page 111).

This course is not offered in part-time mode.

Course structure

The Bachelor of Science in Nanotechnology Innovation requires students to complete 144 credit points of subjects, divided into two streams: the Disciplinary Stream and the Entrepreneurial Stream.

The Disciplinary Stream consists of 84 credit points of nanotechnology subjects. The subject choice identified in Stage 3 of the program allows students to choose either physical or biological streams, and may determine later elective choices. The Entrepreneurial Stream consists of 54 credit points of subjects introducing basic concepts in entrepreneurship, innovation, information technology, business and sustainability. Also in the Entrepreneurial Stream, students undertake a 6-credit-point Capstone Project which involves drawing on scientific, innovation, and venture capital expertise in the University and its partners. Subjects in the Entrepreneurial Stream are drawn from several faculties.

Course program[1]

Stage 1

Autumn semester

D	33190	Mathematical Modelling for Science	6cp
D	60103	Nanosciences 1	6cp
E	24108	Marketing Foundations	6cp
E	31060	Information Systems Principles	6cp

Stage 2

Spring semester

D	65201	Chemistry 2C	6cp
D	60104	Nanosciences 2	6cp
E	48210	Engineering for Sustainability	6cp
E	22107	Accounting for Business	6cp

Stage 3

Autumn semester

D	60xxx	Scanned Probe and Electron Microscopy	6cp
D	65307	Physical Chemistry 1	6cp
E	25559	New Start Financing and Valuation	6cp
E	24307	Electronic Business	6cp

Stage 4

Spring semester

D	60xxx	Nanomaterials	6cp
D	91313	Biochemistry	6cp
E	21193	Introduction to Corporate Strategy	6cp

Entrepreneurial experience

Summer session

Students normally undertake a minimum of eight weeks' industrial experience during this period.

Stage 5

Autumn semester

D	xxxxx	Nanotechnology Innovation elective	6cp
D	xxxxx	Approved Nanotechnology subjects	12cp
E	21227	Innovation and Small Venture Management	6cp

Stage 6

Spring semester

E	xxxxx	Nanotechnology Innovation elective	6cp
D	xxxxx	Approved Nanotechnology subjects	12cp
	2xxxx	Capstone Project (Business Planning)	6cp

D = Disciplinary Stream subject
E = Entrepreneurial Stream subject

1 At the time of printing, the final program for Stages 3, 4, 5 and 6 are yet to go to Faculty Board. Consult the online handbook for the Faculty of Science for the latest information at:

www.uts.edu.au/div/publications/sci/index.html

Recommended subject strands

Students may choose Nanotechnology Innovation electives from the elective options for the Nanotechnology course (see below) or relevant subjects from the Faculty of Science or Business. Students must obtain approval for the electives from the Course Director.

Nanotechnology electives

At the time of printing, the nanotechnology electives are yet to go to Faculty Board. Consult the online handbook for the Faculty of Science for the latest information at:

www.uts.edu.au/div/publications/sci/index.html

Nanotechnology electives will include the following subject areas: Quantum Technology, Advanced Nanocharacterisation and Nanomanipulation, Molecular Devices, Molecular Modelling Methods, Molecular Biology, Transduction of Physical Stimuli by Organisms, Nanosensors and Biosensors, and Nanoengineering and Nanophotonics.

Assessment

Depending on the subjects, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the subject description, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in medical science. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information, contact the Course Director.

Students normally undertake a minimum of eight weeks of entrepreneurial experience in the Summer session between the second and third years of study. Students are linked with industry partners who provide industrial experience in the nanotechnology industry in an environment conducive to innovation and entrepreneurship. The goal is to provide a period of targeted industrial experience that is structured to link with the subjects studied at university and to reinforce students' learning in a workplace setting. Specific arrangements for entering the entrepreneurial experience will be published by the Faculty of Science in 2003.

Other information

All academic inquiries should be made to:

Director, Innovation Programs
Associate Professor Graeme Sheather
Faculty of Business
telephone (02) 9514 5442
fax (02) 9514 5583
email Graeme.Sheather@uts.edu.au

Course Director
Associate Professor Mike Ford
Faculty of Science
telephone (02) 9514 7956
fax (02) 9514 7553
email Mike.Ford@uts.edu.au

HONOURS DEGREE COURSES

Honours programs provide basic training in research and introduce students to advanced areas of study in the relevant discipline. Graduates generally enter occupations for which an Honours degree is the minimum requirement, or continue with postgraduate research.

Admission requirements

Since 1999 all Honours courses, except the Bachelor of Science (Honours) in Applied Chemistry – Forensic Science and the Bachelor of Health Science in Traditional Chinese Medicine (Honours) courses, are one-year, full-time or equivalent part-time courses. They are open to students who possess or have fulfilled all the requirements for a relevant Bachelor's degree from UTS, or equivalent qualification, with at least an average Credit over the final third of the undergraduate program.

Application and selection

Prospective candidates should make an application to the Registrar by 31 October for entry to the Honours degree program in the first semester of the following year. There is provision for consideration of late applications. Applications for entry to Honours degree courses are reviewed by a relevant Faculty selection committee and the Registrar notifies applicants of the results of their applications.

Fees

Higher Education Contribution Scheme (HECS) fees normally apply to all students enrolled in Honours courses. All enrolled students are also required to pay the compulsory University Union and Students' Association charges on enrolment.

Commencement date

Students commencing their Honours course in Autumn semester are normally required to commence work on their Honours program on the first Monday in February. This applies even when formal enrolment is held after this date. Students should contact their supervisor for details.

Award

Honours degrees may be awarded in the following grades: First Class, Second Class Division 1, Second Class Division 2, and Third Class. They are referred to as Bachelor of Science (Honours) with the abbreviation BSc(Hons).

Attendance

Honours courses are offered as full-time programs over two semesters or part-time programs over four semesters. The major component is a research project which extends over the full duration of the course and normally takes the form of an experimental or analytical investigation, undertaken either in the laboratory or the field. Candidates may also be required to undertake one or more critical reviews of the scientific literature in designated areas and to attend formal classes devoted to advanced coursework. The results of the project are presented in an oral seminar and in a written thesis, both of which are formally assessed.

Other information

Interested students should discuss the program and possible research projects available with the relevant Head of Department or Honours Course Coordinator, or with individual members of academic staff.

Bachelor of Science (Honours) in Applied Chemistry

- UTS course code: C09026 (pre-2003: NC06)
- Testamur title: Bachelor of Science (Honours) in Applied Chemistry
- Abbreviation: BSc(Hons)
- Course Director: Dr Barbara Stuart
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 48

Overview

The Honours degree in Applied Chemistry is taken after completing the Bachelor of Science in Applied Chemistry or equivalent course with an average grade of at least Credit.

Course duration

The course is offered on a one-year, full-time, or equivalent part-time basis.

Course program

Stage 1

65861	Honours (Chemistry) 1	24cp

Stage 2

65862	Honours (Chemistry) 2	24cp

Other information

All academic inquiries should be made to:

Honours Program Co-ordinator, Applied Chemistry
Dr Barbara Stuart
Department of Chemistry, Materials and Forensic Science
telephone (02) 9514 1790
fax (02) 9514 1628
email Barbara.Stuart@uts.edu.au

Bachelor of Science (Honours) in Applied Physics

- UTS course code: C09035 (pre-2003: NP06)
- Testamur title: Bachelor of Science (Honours) in Applied Physics
- Abbreviation: BSc(Hons)
- Course Director: Dr Michael Braun
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 48

Overview

This course is taken after completing the Bachelor of Science in Applied Physics or an equivalent course with an average grade of at least Credit over the final third of the course.

Course duration

This course is offered on a one-year, full-time, or equivalent part-time basis.

Course program

Stage 1

68861	Honours (Physics) 1	24cp

Stage 2

68862	Honours (Physics) 2	24cp

Other information

All academic inquiries should be made to:

Course Director, Applied Physics
Dr Michael Braun
Department of Applied Physics
telephone (02) 9514 2202
fax (02) 9514 2219
email Michael.Braun@uts.edu.au

Bachelor of Science (Honours) in Mathematics

- UTS course code: C09020 (pre-2003: MM02)
- Testamur title: Bachelor of Science (Honours) in Mathematics
- Abbreviation: BSc(Hons)
- Course Director: Dr Peter Petocz
- Course fee: HECS (local) $7,000 per semester (international)
- Total credit points: 48

Course aims

The Honours degree provides the opportunity for students to develop their level of competence in the area of mathematics chosen as their major in the Bachelor of Science in Mathematics degree. The Honours degree consists of advanced coursework (comprising two-thirds of the program) and a thesis. This thesis allows students to use the expertise developed by their coursework in an area of application. Students who complete the Honours degree are well prepared to enter the workforce at a high level or to undertake graduate studies.

The precise selection of subjects to be offered in any particular year depends on the interests of students, and the interests and availability of staff. Students should contact the Course Director for Mathematics (Honours), who will assist them in planning their program. This is of particular importance for part-time students since few subjects are offered at night.

Admission requirements

Admission to the Honours degree is assessed individually according to the following criteria.

- Students who are eligible to graduate from the Bachelor of Science in Mathematics degree with an average mark of 65 or more in Year 2 (full-time) of the core and in their chosen major, are eligible for entry to the Honours degree.
- Students who have obtained qualifications equivalent to the Bachelor of Science in Mathematics degree are, upon application, considered for entry by the Head of the Department of Mathematical Sciences, on the basis of assessed potential to complete the Honours degree.

Course duration

The Honours degree is offered on a one-year, full-time, or two-year, part-time basis.

Course structure

The Honours program requires the completion of subjects comprising 48 credit points. Honours is offered in the Mathematics, Statistics and Operations Research majors, although some majors may not be offered in a given year. The program consists of eight coursework subjects, each of 4 credit points, and a thesis of 16 credit points.

Students contemplating taking Honours are advised to consult the Course Director for Mathematics (Honours) or the Course Director for the Bachelor of Science in Mathematics, on completing the core of the Bachelor of Science in Mathematics degree. This enables them to plan studies for the following years and make decisions at an early stage which will not close off options that otherwise would be available to them. Usually students decide to apply for Honours before the completion of the Bachelor of Science in Mathematics but, under the structure of the course, entry to Honours is possible even if the decision to do so is delayed until completion of the Bachelor of Science in Mathematics.

The Honours degree consists of:

- 24 credit points of Honours-level mathematics subjects (numbered as 354xx). These consist of six 4-credit-point subjects, at least five of which must be taken in the major area of study.
- A thesis consisting of a research project of 16 credit points, assessed by a written report and a seminar. A supervisor is appointed to monitor the progress of the thesis and to advise on its preparation. Full-time students must enrol in the subject 35498 Thesis (Honours) or 35493 Thesis (Honours) – Part A *and* 35494 Thesis (Honours) – Part B in the first semester of their program. Part-time students must enrol in one of these subjects at the beginning of their second year.
- 8 credit points consisting of the subjects 35496 Thesis Seminar A and 35497 Thesis Seminar B. These are reading courses designed to complement the research project or to provide additional foundation for graduate study in the area of the project. The thesis supervisor is responsible for designing and administering these subjects. In certain circumstances, these subjects may be replaced by Honours Seminar subjects.

Course program

Subjects offered in the various majors are as follows.

Operations Research major

35443	Advanced Mathematical Programming	4cp
35446	Scheduling Theory	4cp
35447	Discrete Optimisation	4cp
35448	Dynamic Optimisation	4cp
35466	Advanced Stochastic Processes	4cp
35485	Advanced Financial Modelling	4cp
35486	Optimal Control 1	4cp
35487	Optimal Control 2	4cp

Statistics major

35456	Nonlinear Statistical Models	4cp
35457	Multivariate Statistics	4cp
35458	Loglinear Modelling	4cp
35459	Linear Models and Experimental Design	4cp
35466	Advanced Stochastic Processes	4cp
35467	Time Series Analysis	4cp
35469	Statistical Consulting	4cp

Mathematics major

35418	Analytic Number Theory	4cp
35419	Advanced Algebra	4cp
35427	Functional Analysis	4cp
35428	Convexity and Optimisation	4cp
35436	Advanced Mathematical Methods	4cp
35437	Partial Differential Equations	4cp
35438	Nonlinear Dynamical Systems	4cp
35466	Advanced Stochastic Processes	4cp

Each major is augmented by two seminar subjects, 35491 Honours Seminar A and 35492 Honours Seminar B.

Subjects in the Bachelor of Science (Honours) in Mathematics

Subject number	Subject name	Semester offered	Credit points	Prerequisites
35418	Analytic Number Theory	A	4	35314, 35232
35419	Advanced Algebra	A	4	35314
35427	Functional Analysis	S	4	35322
35428	Convexity and Optimisation	A	4	35322
35436	Advanced Mathematical Methods	S	4	35334
35437	Partial Differential Equations	A	4	35335
35438	Nonlinear Dynamical Systems	A	4	35231, 35321
35443	Advanced Mathematical Programming	S	4	35342
35446	Scheduling Theory	S	4	35342, 35447
35447	Discrete Optimisation	A	4	35111, 35342
35448	Dynamic Optimisation	A	4	35241, 35361, 35447c
35456	Nonlinear Statistical Models	S	4	35353
35457	Multivariate Statistics	A	4	35353
35458	Loglinear Modelling	S	4	35353
35459	Linear Models and Experimental Design	S	4	35353, 35457, 35356
35466	Advanced Stochastic Processes	A	4	35322, 35361
35467	Time Series Analysis	A	4	35361
35469	Statistical Consulting	A or S	4	See subject description
35470	Statistical Consulting – Part A	A or S	2	See subject description
35471	Statistical Consulting – Part B	A or S	2	See subject description
35485	Advanced Financial Modelling	A	4	35340
35486	Optimal Control 1	A	4	35231, 35241
35487	Optimal Control 2	S	4	35466, 35486
35491	Honours Seminar A	A or S	4	By consent
35492	Honours Seminar B	A or S	4	By consent
35493	Thesis (Honours) – Part A	A or S	8	By consent
35494	Thesis (Honours) – Part B	A or S	8	By consent
35496	Thesis Seminar A	A	4	By consent
35497	Thesis Seminar B	S	4	By consent
35498	Thesis (Honours)	Y	6	By consent

A = Autumn semester S = Spring semester Y = Full-year subject c = Corequisite

Assessment

The assessment of students' results takes into account the Honours level coursework subjects, the thesis and the seminar. Honours is awarded for the successful completion of the course at the grades of First Class; Second Class, Division 1; Second Class, Division 2; and Third Class.

Other information

All academic inquiries should be made to:

Course Director, Bachelor of Science (Honours) in Mathematics
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Bachelor of Mathematics and Finance (Honours)

- UTS course code: C09021 (pre-2003: MM04)
- Testamur title: Bachelor of Mathematics and Finance (Honours)
- Abbreviation: BMathFin(Hons)
- Course Director: Dr Peter Petocz
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 48

Overview

Honours degree graduates are particularly sought after and their skills enable them to compete for high-entry-level jobs in the banking sector. It is expected that most students will opt to undertake this additional year.

Admission requirements

Admission to the Honours degree is assessed individually according to the following criteria.

- Students who are eligible to graduate from the Bachelor of Mathematics and Finance degree at UTS with an average mark of 65 or more over all subjects in Years 2 and 3 (full-time) are eligible for entry to the Honours degree, subject to the approval of the Head of the Department of Mathematical Sciences and the Head of the School of Finance and Economics.
- Students who have obtained qualifications equivalent to the Bachelor of Mathematics and Finance degree are considered for entry, upon application, by the Heads of the participating Department and School on the basis of their assessed potential to complete the Honours degree.

Course duration

The Bachelor of Mathematics and Finance (Honours) degree requires an additional one year of full-time advanced study.

Course structure

The Honours degree requires completion of subjects comprising 48 credit points. The year consists of coursework subjects of an advanced nature in mathematics, statistics and finance, together with a substantial project. The project involves a major investigation of some area of finance, and provides students with the opportunity to apply the skills developed in their coursework.

Course program

Year 4 of the BMathFin degree

Autumn semester

25921	Theory of Financial Decision Making	6cp
35483	Numerical Methods for Finance	4cp
35457	Multivariate Statistics	4cp
35466	Advanced Stochastic Processes	4cp
35486	Optimal Control 1	4cp

Spring semester

25923	Derivative Security Pricing	6cp
25910	Thesis	12cp
35456	Nonlinear Statistical Models	4cp
35487	Optimal Control 2	4cp

Note: Students are advised to commence preliminary work on their thesis in Autumn semester. The topic and adviser should be chosen and preliminary reading undertaken.

Core subjects in Bachelor of Mathematics and Finance (Honours)

Subject number	Subject name	Semester offered	Credit points	Prerequisites
25921	Theory of Financial Decision Making	A	6	By consent
25923	Derivative Security Pricing	S	6	By consent
25910	Thesis	S	12	By consent
35456	Nonlinear Statistical Models	S	4	35353
35466	Advanced Stochastic Processes	A	4	35322, 35361
35486	Optimal Control 1	A	4	35231, 35241
35487	Optimal Control 2	S	4	35466, 35486
35483	Numerical Methods for Finance	A	4	35102, 35151 and either 35170, 31465
35457	Multivariate Statistics	A	4	35353

A = Autumn semester S = Spring semester

Assessment

The project is assessed on the basis of a thesis and a seminar presented to the staff of the Department and the School.

The assessment of students' results takes into account the Honours level coursework subjects, the thesis and the seminar. Honours is awarded for the successful completion of the course at the grades of First Class; Second Class, Division 1; Second Class, Division 2; and Third Class.

Other information

All academic inquiries should be made to:

Course Director, Bachelor Mathematics and Finance (Honours)
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Bachelor of Medical Science (Honours)

- UTS course code: C09031 (pre-2003: NH07)
- Testamur title: Bachelor of Medical Science (Honours)
- Abbreviation: BMedSc(Hons)
- Course Director: Associate Professor Graham Nicholson
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 48

Overview

This course is taken after completing the Bachelor of Medical Science (see page 87) or equivalent course with an average grade of at least Credit over the final third of the course.

Course duration

The course is offered on a one-year, full-time, or equivalent part-time basis.

Course program

Full-time program

Stages 1 and 2 (Year 1)

Autumn semester

91103	Honours Full Time (Medical and Molecular Biosciences) 1	24cp

Spring semester

91104	Honours Full Time (Medical and Molecular Biosciences) 2	24cp

Other information

All academic inquiries should be made to:

Course Director, Medical Science
Associate Professor Graham Nicholson
Department of Health Sciences
telephone (02) 9514 2230, (02) 9514 2234
fax (02) 9514 2228
email Graham.Nicholson@uts.edu.au

Bachelor of Science (Honours) in Biomedical Science

- UTS course code: C09023 (pre-2003: NA03)
- Testamur title: Bachelor of Science (Honours) in Biomedical Science
- Abbreviation: BSc(Hons)
- Course Director: Associate Professor Graham Nicholson
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 96

Overview

This course is taken after completing the Bachelor of Science in Biomedical Science or Bachelor of Science in Biomedical Science in Forensic Biology with at least a Credit average over the last third of the course.

Course duration

The course is offered on a one-year, full-time, or equivalent part-time basis.

Course program

Full-time program

Stages 1 and 2 (Year 1)

Autumn semester

91103	Honours Full Time (Medical and Molecular Biosciences) 1	24cp

Spring semester

91104	Honours Full Time (Medical and Molecular Biosciences) 2	24cp

Other information

All academic inquiries should be made to:

Head of Department,
Cell and Molecular Biology
Associate Professor Anita Piper
telephone (02) 9514 4103
fax (02) 9514 4026
email Anita.Piper@uts.edu.au

Bachelor of Biotechnology (Honours)

- UTS course code: C09022 (pre-2003: NA02)
- Testamur title: Bachelor of Biotechnology (Honours)
- Abbreviation: BBiotech(Hons)
- Course Director: Associate Professor Kevin Broady
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 48

Overview

This course is taken after completing the Bachelor of Biotechnology or equivalent course with an average grade of at least Credit over the final third of the course.

Course duration

This course is offered on a one-year, full-time, or equivalent part-time basis.

Course program

Full-time program

Stages 1 and 2 (Year 1)

Autumn semester

91103	Honours Full Time (Medical and Molecular Biosciences) 1	24cp

Spring semester

91104	Honours Full Time (Medical and Molecular Biosciences) 2	24cp

Other information

All academic inquiries should be made to:

Head of Department,
Cell and Molecular Biology
Associate Professor Anita Piper
telephone (02) 9514 4103
fax (02) 9514 4026
email Anita.Piper@uts.edu.au

Bachelor of Science (Honours) in Geoscience

- UTS course code: C09028 (pre-2003: NG06)
- Testamur title: Bachelor of Science (Honours) in Geoscience
- Abbreviation: BSc(Hons)
- Course Director: Dr Ursula Munro
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 48

Bachelor of Science (Honours) in Environmental Science

- UTS course code: C09029 (pre-2003: NG07)
- Testamur title: Bachelor of Science (Honours) in Environmental Science
- Abbreviation: BSc(Hons)
- Course Director: Dr Ursula Munro
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 48

Bachelor of Science (Honours) in Biological and Biomedical Science

- UTS course code: C09013 (pre-2003: KB04)
- Testamur title: Bachelor of Science (Honours) in Biological and Biomedical Science
- Abbreviation: BSc(Hons)
- Course Director: Associate Professor Rod Buckley
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 48

Overview

These Honours degrees offer basic training in research and introduce students to advanced areas of study in either geoscience or environmental science (see page 101).

Course duration

Both of these programs are offered on a one-year, full-time, or equivalent part-time basis.

Course program

Full-time programs

Bachelor of Science (Honours) in Geoscience

Stage 1

66856	Honours (Geoscience) 1	24cp

Stage 2

66857	Honours (Geoscience) 2	24cp

Bachelor of Science (Honours) in Environmental Science

Stage 1

91105	Honours (Environmental Science) 1	24cp

Stage 2

91106	Honours (Environmental Science) 2	24cp

Part-time program

Bachelor of Science (Honours) in Biological and Biomedical Science

Year 1 – Stage 1

91133	Honours Part Time (Biological and Biomedical Sciences) Part 1	12cp

Stage 2

91134	Honours Part Time (Biological and Biomedical Sciences) Part 2	12cp

Year 2 – Stage 3

91135	Honours Part Time (Biological and Biomedical Sciences) Part 3	12cp

Stage 4

91136	Honours Part Time (Biological and Biomedical Sciences) Part 4	12cp

Other information

All academic inquiries should be made to:

Associate Professor Greg Skilbeck
Department of Environmental Sciences
telephone (02) 9514 1760
fax (02) 9514 1755
email Greg.Skilbeck@uts.edu.au

COMBINED DEGREE COURSES

Bachelor of Science, Bachelor of Laws

- UTS course code: C10126 (pre-2003: LL04)
- UAC code: 609060
- Testamur titles: Bachelor of Science
  Bachelor of Laws
- Abbreviation: BSc LLB
- Course Director (Science): Associate Professor Rod Buckney
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 240

Bachelor of Medical Science, Bachelor of Laws

- UTS course code: C10131 (pre-2003: LL09)
- UAC code: 609065
- Testamur titles: Bachelor of Medical Science
  Bachelor of Laws
- Abbreviation: BMedSc LLB
- Course Director (Medical Science): Associate Professor Graham Nicholson
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 240

Bachelor of Biotechnology, Bachelor of Laws

- UTS course code: C10140 (pre-2003: LL18)
- UAC code: 609067
- Testamur titles: Bachelor of Biotechnology
  Bachelor of Laws
- Abbreviation: BBiotech LLB
- Course Director (Biotechnology): Associate Professor Kevin Broady
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 240

Overview

Students from each of these degrees, subject to the fulfilment of the requirements described below, graduate with two testamurs. These combined degrees enable graduates to draw together the complex links between the sciences and law, increasing graduate opportunities in both fields. Students are encouraged to undertake the Diploma in Scientific Practice[1], a period of industrial training providing excellent preparation for employment in the field.

[1] The Diploma in Scientific Practice is not available to international students.

Course aims

These courses aim to produce graduates with professional qualifications in science, medical science or biotechnology and in law and who are well prepared to pursue a career in either field. Such graduates may choose to practice law in areas such as environmental, patents and mining law where a strong background in science is of advantage. Alternatively they may choose to enter scientific careers, particularly as advisers, consultants or managers in industries where a knowledge of the law is of particular value.

The law is of special importance in many areas of medical science and biotechnology including medical and health practice, medical and biological research, and industrial and commercial enterprise. Hence, graduates could choose to practise in areas of law, such as certain types of litigation or criminal proceedings, where a strong scientific background in human biology, behavioural science, neuroscience, pharmacology, and molecular biology and biotechnology, is particularly advantageous.

Admission requirements

Local students are required to apply for admission through the NSW Universities Admissions Centre (UAC). For school leavers, admission is based on UAI scores. Non-recent school leavers should apply through UAC in addition to sending a Personal Statement to UTS. Applications are taken from August to end of October each year. Considerations for admission as a non-recent school leaver takes into account the following:

- English proficiency and written expression
- previous legal study
- tertiary study
- legal experience or related employment
- motivation and the reason for wanting to study law (and other discipline in the case of a combined or double degree)
- commitment to study law, and

- supporting material such as professional and personal references and/or letter of employer's support.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, they may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Office of the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester.

Course duration

Each of these courses is offered over:

- five years, full time (students may be expected to attend some evening lectures)
- six years, full time with successful completion of the Diploma in Scientific Practice, or
- six years, full time with Honours.

Course structure

The study components and the requirements for course completion are as follows:

1. The law component comprises at least 144 credit points of study approved by the Faculty of Law.
2. The science component comprises at least 96 credit points of study approved by the Faculty of Science, as outlined below.

   For a student to be eligible for the Bachelor of Science degree, the science component must meet the additional criteria specified in (a)–(c) below.

   (a) The science component must be sufficiently focused to enable the student to command a coherent and integrated body of theoretical and practical knowledge in at least one field of science.

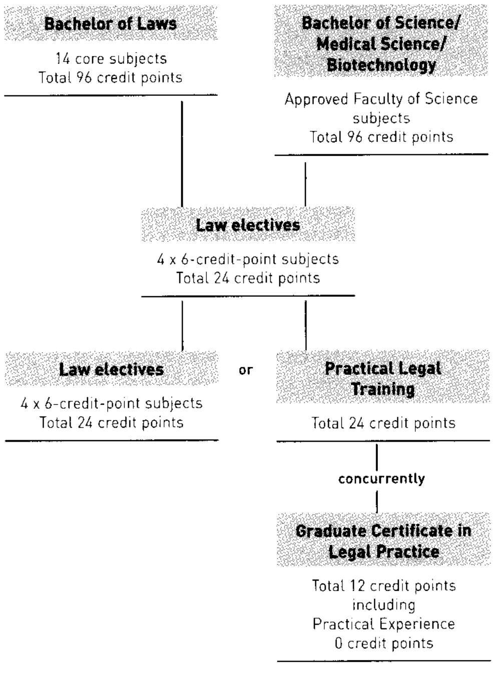
   (b) Within the total of 96 credit points, the value of science subjects that are normally offered in Stages 1 and 2 of an undergraduate course of the Faculty of Science must not exceed 42 credit points.

   (c) Within the total of 96 credit points, the value of science subjects that are normally offered in Stages 5 and 6 of an undergraduate course of the Faculty of Science must be at least 24 credit points.

   To be eligible for a separate Bachelor of Medical Science degree the student must complete the specified 96 credit points of Medical Science subjects.

   To be eligible for a separate Bachelor of Biotechnology degree the student must complete the specified 96 credit points of Biotechnology subjects.
3. On completion of the science, medical science or biotechnology component as set out in 2 above, a student who has also completed at least 96 credit points of law subjects approved by the Faculty of Law is eligible for the award of Bachelor of Science.
4. A student who qualifies for the award of Bachelor of Science according to 3 above will, on completion of the law component as approved by the Faculty of Law, be eligible for the award of Bachelor of Laws.
5. A student who completes 144 credit points of study approved by the Faculty of Law and 96 credit points of study approved by the Faculty of Science but does not satisfy the conditions set out in 2(a)–2(c) above will be eligible for the award of Bachelor of Science, Bachelor of Laws (single testamur).

Course diagram



Course program

Year 1

Autumn semester

70113	Legal Process and History	10cp
70105	Legal Research	4cp
xxxxx	Approved Science subjects	12cp

Spring semester

70217	Criminal Law	6cp
70211	Law of Contract	8cp
xxxxx	Approved Science subjects	12cp

Year 2

Autumn semester

70311	Law of Tort	8cp
70616	Federal Constitutional Law	8cp
xxxxx	Approved Science subject	6cp

Spring semester

70318	Personal Property	4cp
70317	Real Property	8cp
xxxxx	Approved Science subjects	12cp

Year 3

Autumn semester

70417	Corporate Law	8cp
70617	Administrative Law	8cp
xxxxx	Approved Science subject	6cp

Spring semester

70516	Equity and Trusts	8cp
76xxx	Elective Subject 1 (Faculty of Law)	6cp
xxxxx	Approved Science subjects	12cp

Year 4

Autumn semester

71216	Law of Evidence	6cp
71005	Practice and Procedure	4cp
xxxxx	Approved Science subjects	12cp

Spring semester

71116	Remedies	6cp
76xxx	Elective Subject 2 (Faculty of Law)	6cp
xxxxx	Approved Science subjects	12cp

Year 5

Autumn semester

76xxx	Elective Subject 3 (Faculty of Law)	6cp
76xxx	Elective Subject 4 (Faculty of Law)	6cp
xxxxx	Approved Science subjects	12cp

Spring semester

	Practice Legal Training (PLT)	24cp
	or	
	Four Law electives	24cp

For further details on approved science programs and subjects, see Recommended Science Strands on page 143.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in science. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information, contact the Course Director.

Professional recognition

Students completing these courses are able to apply for admission as either solicitors or barristers to the Supreme Court of New South Wales.

Depending on the science specialisation and subjects chosen, graduates may be eligible for admission to their relevant scientific professional organisation.

Other information

All academic inquiries relating to the science component of these degrees should be made to:

Office of the Associate Dean (Teaching and Learning)
Associate Professor Rod Buckney
telephone (02) 9514 4044
fax (02) 9514 4095
email Rod.Buckney@uts.edu.au

For administrative queries, or inquiries relating to the law component of these degrees contact:

Faculty of Law
telephone (02) 9514 3444

Bachelor of Science, Bachelor of Business

- UTS course code: C10162 (pre-2003: N006)
- UAC code: 609170
- Testamur titles: Bachelor of Science Bachelor of Business
- Abbreviation: BSc BBus
- Course Director (Science): Associate Professor Rod Buckney
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 192

Bachelor of Medical Science, Bachelor of Business

- UTS course code: C10163 (pre-2003: N007)
- UAC code: 609175
- Testamur titles: Bachelor of Medical Science Bachelor of Business
- Abbreviation: BMedSc BBus
- Course Director (Medical Science): Associate Professor Graham Nicholson
- Course fee: HECS (local) $7,500 per semester (international)
- Total credit points: 192

Bachelor of Biotechnology, Bachelor of Business

- UTS course code: C10169 (pre-2003: N013)
- UAC code: 609176
- Testamur titles: Bachelor of Biotechnology Bachelor of Business
- Abbreviation: BBiotech BBus
- Course Director (Biotechnology): Associate Professor Kevin Broady
- Course fee: HECS (local) $8,000 per semester (international)
- Total credit points: 192

Overview

The Faculty of Science, in collaboration with the Faculty of Business, offers combined degree programs in Science, Medical Science or Biotechnology and Business (two testamurs) designed to produce graduates who are well prepared for scientific practice in technically-oriented businesses or who are equipped to enter administration in scientific institutions.

Course aims

These courses are aimed at producing graduates with professional qualifications in science, medical science or biotechnology and in business and who are well prepared to pursue a career in either field. Depending on the science and business disciplines chosen, graduates could find themselves working in commodity and resource trading, the pharmaceutical industry, as scientists in some of the leading consumer goods companies, in health services and management, medical research organisations, industry, hospitals, environmental protection agencies and government.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC English Advanced, Mathematics, and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

Students wishing to transfer from the combined degree program to the Bachelor of Business or Bachelor of Medical Science single degree program, and whose UAI is less than the current entry rank for the Bachelor of Business, will be required to apply for admission through UAC in the non-recent school leaver category.

There is provision for students already enrolled in a Bachelor of Science or a Bachelor of Business degree to transfer to a combined degree program. Students currently enrolled in a Science or Business program are permitted entry to a combined degree program if they meet the entry requirement for a combined degree and/or have demonstrated satisfactory progress in their current program of study.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE. Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. Part-time attendance involves approximately 12 hours each week at the University. Part-time students may need to attend Science classes for at least one half-day per week, in addition to evening classes.

Course duration

Each of these combined degree courses is offered over:

- four years, full time
- eight years, part time
- five years, full time with successful completion of the Diploma in Scientific Practice, or
- five years, full time with Honours.

Course structure

Students are required to complete 96 credit points of Science, medical science or biotechnology subjects and to complete 96 credit points of business subjects.

Science component

Students are required to complete 96 credit points of science subjects focused on a major area of study, or 96 credit points of Medical Science or Biotechnology subjects.

Science majors may be taken in the following areas:

- Applied Chemistry
- Applied Physics
- Biomedical Science
- Environmental Biology
- Nanotechnology.

New major study areas:

- Earth Science
- Environmental Horticulture.

Completion of a science disciplinary strand is essential, as is the completion of the Business core subjects and a Business major.

Business component

Business major may be taken in the following areas:

- Accounting
- Banking
- Electronic Business
- Economics
- Finance
- International Business
- Management
- Marketing
- Sport Management
- Tourism.

The Information Technology major is not available to students in these programs.

Course program

The general pattern of subjects is expected to be as follows, though students who have timetabling difficulties may apply to vary their program. Students are advised to take the part-time sequence of subjects as recommended above for each science course, though they may enrol in full-time classes in these subjects and are not restricted to the part-time timetable.

Stage 1

Autumn semester

Science foundation subjects		12cp
22107	Accounting for Business	6cp
79203	Business Law and Ethics	6cp

Stage 2

Spring semester

Science foundation subjects		12cp
21129	Managing People and Organisations	6cp
24108	Marketing Foundations	6cp

Stage 3

Autumn semester

Science foundation and major subjects		12cp
25115	Economics for Business	6cp
26133	Business Information Analysis	6cp

Stage 4

Spring semester

Science foundation and major subjects	12cp
Business core elective 1	6cp
Business core elective 2	6cp

Stage 5

Autumn semester

Science major subjects	12cp
Business major subjects	12cp

Stage 6

Spring semester

Science major subjects	12cp
Business major subjects	12cp

Stage 7

Autumn semester

Science major subjects	12cp
Business major subjects	12cp

Stage 8

Spring semester

Science major subjects	12cp
Business major subjects	12cp

Note: For further details of Business majors available, consult the 2003 handbook for the Faculty of Business.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and research work in sciences. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information, contact the Course Director.

Professional recognition

Depending on disciplines chosen, students may be eligible for entry to the relevant professional associations.

Other information

All academic and administrative inquiries should be made to:

Office of the Associate Dean (Teaching and Learning)
Associate Professor Rod Buckney
telephone (02) 9514 4044
fax (02) 9514 4095
email Rod.Buckney@uts.edu.au

For further details on approved Science programs and subjects, see Recommended Science Strands on page 143.

Bachelor of Science, Bachelor of Engineering

- UTS course code: C10073 (pre-2003: E013)
- UAC code: 609360
- Testamur title: Bachelor of Science Bachelor of Engineering
- Abbreviation: BSc BE
- Course Director (Science): Associate Professor Rod Buckney
- Course fee: HECS (local) $8,000 per semester (international)
- Total credit points: 240

Bachelor of Medical Science, Bachelor of Engineering

- UTS course code: C10075 (pre-2003: E015)
- UAC code: 609370
- Testamur title: Bachelor of Medical Science Bachelor of Engineering
- Abbreviation: BMedSc BE
- Course Director (Medical Science): Associate Professor Rod Buckney
- Course fee: HECS (local) $8,000 per semester (international)
- Total credit points: 240

Bachelor of Biotechnology, Bachelor of Engineering

- UTS course code: C10078 (pre-2003: E018)
- UAC code: 609360
- Testamur title: Bachelor of Biotechnology Bachelor of Engineering
- Abbreviation: BBiotech BE
- Course Director (Biotechnology): Associate Professor Rod Buckney
- Course fee: HECS (local) $8,000 per semester (international)
- Total credit points: 240

Overview

There is a strong interrelation between the progress of engineering and developments in science, and a demonstrated need for professionals with a strong understanding and experience in both areas. These combined degree programs (two testamurs each) are designed to provide opportunities for students interested in science, the scientific basis of engineering and technology, and the technology itself. An interest in careers with a strong research and innovation component will be a key graduate attribute.

These double degree courses enable students to combine a Bachelor of Engineering in any one of the offered majors (Civil, Civil and Environmental, Computer Systems, Construction, Electrical, Mechanical, Mechanical and Mechatronic, Software, or Telecommunications) with a Bachelor of Science, Bachelor of Medical Science or Bachelor of Biotechnology, provided the UAI requirement for the selected major is met.

Course aims

These courses are aimed at producing graduates with professional qualifications in science, medical science or biotechnology and engineering and who are well prepared to pursue a career in either field, or one that combines the skills of both. Depending on the science and engineering disciplines chosen, graduates of this course will work as cutting edge professionals where science and engineering interact most dynamically. Graduates could find themselves working in medical technology and instrumentation, biotechnology, environmental protection and management, energy and resource exploration and development, communications, mathematical modelling, transportation, construction, nanotechnology, molecular biology and materials technology.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC English Advanced, Mathematics, and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

There is provision for students already enrolled in a Bachelor of Science or a Bachelor of Engineering degree to transfer to the combined degree program. Students currently enrolled in a Science or Engineering program are permitted entry to the combined degree program if they satisfy either of the following criteria:

- they meet the entry requirement for the combined degree and have demonstrated satisfactory progress in their current program of study, or
- they have achieved a Credit weighted average mark over at least two stages of their current program.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, they may apply to receive recognition of successful prior learning, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Office of the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

Each of these courses is offered over:

- five years, full time
- ten years, part time, or
- six years, full time with Honours.

Course structure

Science component

Students are required to complete 96 credit points of science subjects, of which at least 72 credit points must focus on a major area of study in science, medical science or biotechnology.

Science majors may be taken in the following areas:

- Applied Chemistry
- Applied Physics
- Biomedical Science
- Environmental Biology
- Nanotechnology.

New major study areas:

- Earth Science
- Environmental Horticulture.

Engineering component

Students undertake the engineering degree in any of the majors on offer, provided the UAI requirement for the selected major is met (presently Civil, Civil and Environmental, Computer Systems, Construction, Electrical, Mechanical, Mechanical and Mechatronic, Software or Telecommunications).

Course program

BE (any major), Bachelor of Science – standard program

Subject number	Subject name
Semester 1	
	Science major 1[1]
33130	Mathematical Modelling 1
68037	Physical Modelling
48xxx	Introduction to xxxxx[2]
Semester 2	
	Science major 2
33230	Mathematical Modelling 2
	Two fields of practice subjects[3]
Semester 3	
48210	Engineering for Sustainability
48221	Informatics VB
	or
48023	Object-oriented Programming
	Science major 3
	Science major 4
Semester 4	
	Science major 5
	Science major 6
	Two fields of practice subjects
Semester 5	
48230	Engineering Communication
	Fields of practice subject
	Science major 7
	Science major 8
Semester 6	
48240	Uncertainties and Risks in Engineering
	Three fields of practice subjects
Semester 7	
48250	Engineering Economics and Finance
	Three fields of practice subjects
Semester 8	
	Science major 9
	Science major 10
	Science major 11
	Science major 12
Semester 9	
48260	Engineering Management
	Two fields of practice subjects
	Science major 13
Semester 10	
48270	Technology Assessment
	Fields of practice subject
	Capstone Project
	Capstone Project/elective

1 The 13 Science major subjects are listed under Recommended Science strands.

2 Students must enrol in the subject which corresponds to their Engineering major.

3 Students must complete the 14 fields of practice subjects specific to their chosen Engineering major.

BE (any major), Bachelor of Medical Science – standard program

Subject number	Subject name
Semester 1	
91701	Medical Science 1
33130	Mathematical Modelling 1
68037	Physical Modelling
48xxx	Introduction to xxxxx[1]
Semester 2	
91702	Medical Science 2
33230	Mathematical Modelling 2
	Fields of practice subject[2]
65101	Chemistry 1C
Semester 3	
48210	Engineering for Sustainability
48221	Informatics VB
	or
48023	Object-oriented Programming
65201	Chemistry 2C
91703	Physiological Systems
Semester 4	
91704	Behavioural Sciences
	Three fields of practice subjects
Semester 5	
48230	Engineering Communication
	Fields of practice subject
91707	Pharmacology 1
91313	Biochemistry 1
Semester 6	
48240	Uncertainties and Risks in Engineering
	Three fields of practice subjects
Semester 7	
48250	Engineering Economics and Finance
	Three fields of practice subjects
Semester 8	
91705	Medical Devices and Diagnostics
91708	Psychophysiology
	(Bio) Medical Science elective
Semester 9	
48260	Engineering Management
	Two fields of practice subjects
	and one of the following
91709	Pharmacology 2
91706	Neuroscience
Semester 10	
48270	Technology Assessment
	Fields of practice subject
	Capstone Project
	Capstone Project/elective

1 Students must enrol in the subject which corresponds to their Engineering major.

2 Students must complete the 14 fields of practice subjects specific to their chosen Engineering major.

BE (any major), Bachelor of Biotechnology–standard program

Subject number	Subject name
Semester 1	
91701	Medical Science 1
33130	Mathematical Modelling 1
68037	Physical Modelling
48xxx	Introduction to xxxxx[1]
Semester 2	
91702	Medical Science 2
33230	Mathematical Modelling 2
	Fields of practice subject[2]
65012	Chemistry 1A
Semester 3	
48210	Engineering for Sustainability
48221	Informatics VB
	or
48023	Object-oriented Programming
91313	Biochemistry 1
91314	General Microbiology
Semester 4	
65022	Chemistry 2A
	Three fields of practice subjects
Semester 5	
48230	Engineering Communication
	Fields of practice subject
	Molecular Biology 1
Semester 6	
48240	Uncertainties and Risks in Engineering
	Three fields of practice subjects
Semester 7	
48250	Engineering Economics and Finance
	Three fields of practice subjects
Semester 8	
	one of the following two subjects
91128	Plant Biotechnology
91351	Immunology 1
	and
91326	Analytical Biochemistry
91330	Epidemiology and Public Health Microbiology
	and one of the following
91335	Molecular Biology 2
91368	Bioreactors and Bioprocessing
Semester 9	
48260	Engineering Management
	Two fields of practice subjects
91369	Biobusiness and Environmental Biotechnology
Semester 10	
48270	Technology Assessment
	Fields of practice subject
	Capstone Project
	Capstone Project/elective

1 Students must enrol in the subject which corresponds to their Engineering major.

2 Students must complete the 14 fields of practice subjects specific to their chosen Engineering major.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details for individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Honours

The Honours program is designed to introduce students to more advanced coursework and to research work in sciences. It allows selected students to continue on with postgraduate studies if desired and enhances their employment prospects. For further information contact the Course Director.

Professional recognition

Depending on disciplines chosen, students may be eligible for entry to the relevant professional associations. This degree meets the requirements for admission into the Institute of Engineers

Other information

For further information on Engineering majors and approved study programs, consult the Faculty of Engineering handbook, or the Undergraduate and Postgraduate Office (UPO) in the Faculty of Engineering.

All academic inquiries relating to the science component should be made to:

Office of the Associate Dean (Teaching and Learning)
Associate Professor Rod Buckney
telephone (02) 9514 4044
fax (02) 9514 4095
email Rod.Buckney@uts.edu.au

Bachelor of Science, Bachelor of Engineering, Diploma in Engineering Practice

- UTS course code: C10074 (pre-2003: E014)
- Testamur title: Bachelor of Science (in name of science major where applicable) Bachelor of Engineering in (name of engineering major) Diploma in Engineering Practice
- Abbreviation: BSc BE DipEngPrac
- Course fee: HECS (local) $8,000 per semester (international)[1]
- Total credit points: 252

Overview

This combined degree (two testamurs) course is the same as the Bachelor of Engineering, Bachelor of Science except for the additional requirement of two internships and completion of the Engineering Practice Program of the Bachelor of Engineering, Diploma in Engineering Practice. The combined course is 252 credit points and has a nominal completion time of six years.

Students in the combined Bachelor of Engineering, Bachelor of Medical Science and Bachelor of Engineering, Bachelor of Biotechnology can transfer to the program including the Diploma in Engineering Practice.

[1] $5,000 per semester during Engineering Internships.

Bachelor of Science, Bachelor of Arts in International Studies

- UTS course code: C10161 (pre-2003: N004)
- UAC code: 609250
- Testamur title: Bachelor of Science
  Bachelor of Arts in International Studies
- Abbreviation: BSc BA
- Course Director: Associate Professor Rod Buckney
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 240

Bachelor of Medical Science, Bachelor of Arts in International Studies

- UTS course code: C10167 (pre-2003: N011)
- UAC code: 609255
- Testamur title: Bachelor of Medical Science
  Bachelor of Arts in International Studies
- Abbreviation: BMedSc BA
- Course Director: Associate Professor Rod Buckney
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 240

Bachelor of Biotechnology, Bachelor of Arts in International Studies

- UTS course code: C10168 (pre-2003: N012)
- UAC code: 609257
- Testamur title: Bachelor of Biotechnology
  Bachelor of Arts in International Studies
- Abbreviation: BBiotech BA
- Course Director: Associate Professor Rod Buckney
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 240

Overview

The Faculty of Science, in collaboration with the Institute for International Studies, offers a combined degree program in Science and International Studies which is aimed at increasing students' awareness of international contexts and producing graduates who are well prepared for professional careers in science in an international setting.

The Bachelor of Arts in International Studies requires undergraduates to study a major — a region or country specialisation — over a minimum of three years. Students study Language and Culture in Sydney for at least two years, followed by a period of study overseas.

Admission requirements

Australian students are required to apply for admission through the NSW University Admissions Centre (UAC). For school leavers, admission is based on UAI scores. We recommend that HSC studies include the following subjects: HSC English Advanced, Mathematics, and at least one science subject. Non-recent school leavers should apply through UAC in addition to submitting a Personal Statement to UTS. Applications are taken from September to December each year.

International students should contact the UTS International Programs Office (IPO) for application procedures. In addition to academic requirements, students are required to meet English language proficiency requirements. Further details are available from IPO.

There is provision for students already enrolled in a Bachelor of Science to transfer to the combined degree program. Applications for transfer are decided on the basis of academic merit and the preparedness of the student for undertaking International Studies.

Students admitted to the first year of the course may select any of the Science programs listed above provided that their entry rank is equal to or better than the cut-off for the chosen program.

Advanced standing

UTS recognises prior tertiary level learning, including that from other universities and TAFE (Associate Diploma and Diploma only). Once a student's application to study has been accepted, he or she may apply to receive recognition of successful prior learning in Science, and may therefore be able to complete the course in less than the standard time. Applications for credits and exemptions should be made to the Associate Dean (Teaching and Learning) in the Faculty of Science.

Attendance

Full-time attendance involves approximately 24 hours each week at the University. This enables a full stage of the course to be completed in one semester. Part-time attendance involves approximately 12 hours each week at the University. This form of attendance allows students to complete a full stage in one year. It is expected that employers will release part-time students for at least one half-day per week for attendance at classes.

Course duration

Each of these courses is offered over:

- five years, full time
- six years, full time with successful completion of the Diploma in Scientific Practice, or
- six years, full time with Honours.

Course structure

Students are required to complete 144 credit points of science subjects focused on a major area of study, or of medical science or biotechnology subjects.

This combined degree in Science is offered in conjunction with the following science majors:

- Applied Chemistry
- Applied Physics
- Biomedical Science
- Environmental Biology
- Nanotechnology.

New major study areas:

- Earth Science
- Environmental Horticulture.

International Studies component

The Bachelor of Arts in International Studies requires undergraduates to study a major – a region or country – over a minimum of three years. In Sydney, students study Language and Culture for at least two years, followed by a period of study overseas.

In the International Studies program, students study one of the following countries or majors: Canada (Québec), Chile, China, France, Germany, Indonesia, Italy, Japan, Latino Studies (USA), Malaysia, Mexico, Spain, Switzerland and Thailand. There are two other majors available that permit students to pursue programs of study about and in countries where other arrangements have not already been made. The Heritage major permits students with significant prior knowledge of a particular language and culture to continue their study in countries such as Croatia, Greece, Hong Kong, Korea, Poland, Russia, Taiwan, the Philippines, Vietnam and others. The Independent Study major is available where a language is taught in Sydney and a program of In-country Study can be arranged.

Australia and the Asia–Pacific is only available as a major to international students. International students may access one of the other majors offered provided that the country they choose as their major is able to grant them a visa to study there. This needs to be determined prior to commencing subjects within the major. If a visa cannot be granted, then it is not possible to undertake the chosen major.

Students are admitted to the International Studies program with no guarantee of entry to a specific major, although every effort is made to meet students' preferences. The Institute reserves the right to allocate places in majors according to its resources and arrangements with overseas universities.

Each major includes 32 credit points (four 8-credit-point subjects) of instruction in Language and Culture; 8 credit points of study of Comparative Social Change; 8 credit points of study of Contemporary Society; and 48 credit points (two semesters) of study at a university or institution of higher education in the country of the major.

There are no prior language requirements for the International Studies component of this combined degree, except for programs within the Heritage major.

Arrangements for In-country Study

Students are required to complete all appropriate subjects in their combined degree, including four consecutive semesters of study of Language and Culture before proceeding to In-country Study.

The Institute for International Studies makes arrangements for students to spend two semesters of In-country Study at an institution of higher education in the country of their major. The costs of tuition at overseas universities and of travel between Sydney and the student's place of study are paid by UTS, except in cases where a scholarship has been awarded to a student with provision for these costs. Visa fees are also paid by UTS, and students are covered by the UTS Overseas Insurance Policy. Students undertaking the Heritage or Independent Study major may be required to bear some of the tuition costs at the overseas university. During their In-country Study, students continue to be enrolled at UTS and to pay HECS for their study.

Students must pay the costs of accommodation and other living expenses during their period of In-country Study. Students should be aware that the living costs vary from country to country and that in some countries, such as Japan, living costs are high.

The In-country Study is the key component of the International Studies program. It provides a unique opportunity for students to immerse themselves in the language and culture of another country through a learning program at a host university, through involvement in the life of the local community and through project work which is supervised by the Institute. Each student's individual study program depends on their level of language competence and the subjects and other learning experiences that are available at the host university. All students who undertake In-country Study must agree to the Institute's Conditions of Participation for In-country Study. Any study undertaken at the host university during the two semesters of In-country Study is part of the In-country Study experience. Students may not credit any subjects completed at their host university during the period of In-country Study towards the professional component of their combined degree.

Course program

The following general pattern is be followed for each Pass combined degree in Science and International Studies. A different pattern, extending over six years, would apply to a combined degree involving the Bachelor of Science (Honours) in Applied Chemistry — Forensic Science, details of which will be worked out in consultation with the Associate Dean (Teaching and Learning) in Science.

Year 1		
Autumn semester		
Stage 1	FT Science program	24cp
Spring semester		
Stage 2	FT Science program	24cp
Year 2		
Autumn semester		
Stage 3/4	PT Science program	9–12cp
50140	Comparative Social Change	8cp
971xxx	Language and Culture 1	8cp
Spring semester		
Stage 3/4	PT Science program	12–15cp
972xxx	Language and Culture 2	8cp
Year 3		
Autumn semester		
Stage 3/4	PT Science program	12–15cp
973xxx	Language and Culture 3	8cp
Spring semester		
Stage 3/4	PT Science program	9–12cp
974xxx	Language and Culture 4	8cp
976xxx	Contemporary Society	8cp
Year 4		
Autumn semester		
977xxx	In-country Study 1	24cp
Spring semester		
978xxx	In-country Study 2	24cp
Year 5		
Autumn semester		
Stage 5	FT Science program	24cp
Spring semester		
Stage 6	FT Science program	24cp

Note: Subject descriptions for International Studies subjects are included in this handbook.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Professional recognition

Depending on science disciplines chosen, students may be eligible for entry to the relevant professional associations.

Other information

All academic inquiries relating to the science component of these degrees should be made to:

Associate Dean (Teaching and Learning)
Associate Professor Rod Buckney
telephone (02) 9514 4044
fax (02) 9514 4095
email Rod.Buckney@uts.edu.au

Any inquiries relating to the International Studies component of this course should be directed to the Institute for International Studies, telephone (02) 9514 1574.

Combined degree students are required to confirm, during the University enrolment period, the subjects they intend to take for the year with the Institute at 10 Quay Street, Haymarket, Sydney.

Bachelor of Mathematics and Computing, Diploma of Information Technology Professional Practice

- UTS course code: to be advised (pre-2003: MM08) (subject to approval)
- Testamur title: Bachelor of Mathematics and Computing
  Diploma of Information Technology Professional Practice
- Abbreviation: BMathComp DipInfTechProfPrac
- Course Director: Dr Tim Langtry
- Course fee: HECS (local)
  $7,500 per semester (international) plus $2,000 in total for the DipInfTechProfPrac
- Total credit points: 156

Overview

This degree combines the Bachelor of Mathematics and Computing with a formal year of industrial training in the Information Technology industry, recognised by the Diploma of Information Technology Professional Practice. There is no direct entry to this course. Students will normally enrol in the Bachelor of Mathematics and Computing (see page 80) and apply to transfer to the Bachelor of Mathematics and Computing, Diploma of Information Technology Professional Practice program before commencing the Diploma of Information Technology Professional Practice component of the program.

Course duration

The degree is offered as a full-time course over four years and as a part-time course over six years.

Course structure

The Bachelor of Mathematics and Computing, Diploma of Information Technology Professional Practice is offered jointly with the Faculty of Information Technology as a Pass degree requiring the completion of subjects with a total value of 156 credit points. The course consists of 144 credit points of academic study in the Bachelor of Mathematics and Computing plus 12 credit points of study in the Diploma in Information Technology Professional Practice. Students who graduate from the course at a sufficiently high standard are eligible to enter either the Bachelor of Science (Honours) in Mathematics (see page 113) or the Bachelor of Science (Honours) in Information Technology course (offered by the Faculty of Information Technology).

Course program

Full-time program

Years 1, 2 and 4 of the full-time program are identical to years 1, 2 and 3 (respectively) of the Bachelor of Mathematics and Computing full-time course program (see page 80). Students may choose to follow a generic program, or to specialise in one of the mathematical sciences of Operational Research or Statistics. Year 3 of the BMathComp DipInfTechProfPrac consists of a combination of industrial training and reflection upon the experience gained during this training. The course program for this year (below) recognises both components.

Stage 5

Autumn semester

31136	Preparation and Review of IT Experience	6cp
31137	IT Experience 1	0cp

Stage 6

Spring semester

31138	Review of IT Experience	6cp
31139	IT Experience 2	0cp

Part-time program

Years 1 to 4 of the part-time program coincide with the corresponding years of the part-time program in the Bachelor of Mathematics and Computing. In years 5 and 6 of the program students study the same sequence of subjects as in the corresponding years of the Bachelor of Mathematics and Computing program, plus the Diploma of Information Technology Professional Practice subjects, as described below.

Stage 10

Autumn semester

3xxxx	Two subjects as in the Bachelor of Mathematics and Computing	12cp
	plus	
31136	Preparation and Review of IT Experience	6cp
31137	IT Experience 1	0cp

Stage 11

Spring semester

3xxxx	Two subjects as in the Bachelor of Mathematics and Computing	12cp

Autumn semester

3xxxx	Two subjects as in the Bachelor of Mathematics and Computing	12cp
	plus	
31138	Review of IT Experience	6cp
31139	IT Experience 2	0cp

Stage 12

Spring semester

3xxxx	Two subjects as in the Bachelor of Mathematics and Computing	12cp

Other information

All inquiries should be made to:

Course Director, Bachelor of Mathematics and Computing
Dr Tim Langtry
Department of Mathematical Sciences
telephone (02) 9514 2261
fax (02) 9514 1537
email Tim.Langtry@uts.edu.au

Bachelor of Health Science in Traditional Chinese Medicine, Bachelor of Arts in International Studies[1]

- UTS course code: C10164 (pre-2003: N008)
- Testamur title: Bachelor of Health Science in Traditional Chinese Medicine
  Bachelor of Arts in International Studies
- Abbreviation: BHlthSc BA
- Course Director: Mr Chris Zaslawski
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 240

Overview

The combined degree program in Traditional Chinese Medicine and International Studies is offered jointly by the Faculty of Science and the Institute for International Studies. It provides students with greater exposure to, and understanding of, Chinese culture and a working knowledge of Chinese. Apart from its wider educational goals, the program should also make it more possible for Traditional Chinese Medicine graduates to practise outside Australia.

Students do not need to have previously studied Chinese to be able to successfully complete the program. All students are required to complete four consecutive semesters of study of Chinese Language and Culture before proceeding to China for an academic year of study. There are various classes available for students with different levels of language proficiency: from classes for complete beginners, to classes for those who have completed HSC-level Chinese and for those with more advanced language skills.

Course duration

This combined degree is offered on a six-year, full-time basis.

Course structure

The Bachelor of Health Science in Traditional Chinese Medicine, Bachelor of Arts in International Studies is a six-year degree program in which the study of Traditional Chinese Medicine is integrated with the China major of the International Studies Program. Students spend the fifth year of study at a Chinese university. All existing arrangements for both the Bachelor of Health Science in Traditional Chinese Medicine and the Bachelor of Arts in International Studies apply equally to the combined degree program in Traditional Chinese Medicine and International Studies.

To graduate with a Bachelor of Health Science in Traditional Chinese Medicine, Bachelor of Arts in International Studies, a student is required to have completed 288 credit points of study: 192 credit points in Traditional Chinese Medicine and 96 credit points in Chinese Studies.

International Studies component

Students undertaking this degree may only study China as their international studies major. Students do not need to have previously studied Chinese to be able to successfully complete the program. All students are required to complete four consecutive semesters of study of Chinese Language and Culture before proceeding to China for an academic year of study. There are various classes available for students with different levels of language proficiency: from classes for complete beginners, to classes for those who have completed HSC-level Chinese and for those with more advanced language skills.

The International Studies component is 96 credit points, and includes 32 credit points (four 8-credit-point subjects) of instruction in Chinese Language and Culture; 8 credit points (one subject) of study of Comparative Social Change; 8 credit points (one subject) of study of Contemporary China; and 48 credit points (two semesters) of study at a university or institution of higher education in China.

Arrangements for In-country Study

Students are required to complete all appropriate subjects in their combined degree, including four consecutive semesters of study of Language and Culture before proceeding to In-country Study.

The Institute for International Studies makes arrangements for students to spend two semesters of In-country Study at an institution of higher education in China. The costs of tuition at overseas universities and of travel between Sydney and the student's place of study are paid by UTS, except in cases where

[1] Entry to this degree is by internal transfer from the Bachelor of Health Science in Traditional Chinese Medicine (C10186). Students in C10186 apply during Year 2 for transfer to C10164, commencing in Year 3.

a scholarship has been awarded to a student with provision for these costs. Visa fees are also paid by UTS, and students are covered by the UTS Overseas Insurance Policy. During their In-country Study, students continue to be enrolled at UTS and to pay HECS for their study.

Students must pay the costs of accommodation and other living expenses during their period of In-country Study. Students may expect that no greater costs are incurred through undertaking in-country study in China than are involved in living away from home in Sydney.

The In-country Study is the key component of the International Studies program. It provides a unique opportunity for students to immerse themselves in the language and culture of another country through a learning program at a host university, through involvement in the life of the local community and through project work which is supervised by the Institute. Each student's individual study program depends on their level of language competence and the subjects and other learning experiences that are available at the host university. All students who undertake In-country Study must agree to the Institute's Conditions of Participation for In-country Study. Any study undertaken at the host university during the two semesters of In-country Study is part of the In-country Study experience. Students may not credit any subjects completed at their host university during the period of In-country Study towards the professional component of their combined degree.

Course program

Stage 1

Autumn semester

99560	Introduction to TCM	6cp
99502	Foundations of TCM	6cp
99563	Health Sciences 1	6cp
99642	Clinic Theory and Clinic Level 1	4cp

Stage 2

Spring semester

99564	The Physiology of *Qi*	4cp
99617	Point Location 1	8cp
99570	Health Sciences 2	6cp
92167	Foundations of Helping and Caring	4cp
99643	Clinic Theory and Clinic Level 2	4cp

Stage 3

Autumn semester

99618	Chinese Diagnostic System 1	6cp
99567	Introduction to Chinese Herbal Medicine	6cp
99636	Essentials of Pathophysiology	6cp
99644	Clinic Theory and Clinic Level 3	4cp

Stage 4

Spring semester

99620	History and Philosophy of TCM	4cp
99621	Chinese Diagnostic System 2	6cp
99622	Pharmacology of Traditional Chinese Medicine	6cp
99579	Chinese Massage (*Tuina*)	6cp
99645	Clinic Theory and Clinic Level 4	4cp

Stage 5

Autumn semester

971111	Chinese Language and Culture 1	8cp
99623	Chinese Herbal Formulae	8cp
99646	Clinic Theory and Clinic Level 5	6cp

Stage 6

Spring semester

972111	Chinese Language and Culture 2	8cp
976111	Contemporary China	8cp
99626	Microsystems and Advanced Treatment Techniques	8cp
99647	Clinic Theory and Clinic Level 6	6cp

Stage 7

Autumn semester

973111	Chinese Language and Culture 3	8cp
50140	Comparative Social Change	8cp
99637	TCM Disease States 1	4cp

Stage 8

Spring semester

974111	Chinese Language and Culture 4	8cp
99627	Clinical Practicum	8cp
99590	Special Topics in TCM (Intermodal and Professional)	8cp
99638	TCM Disease States 2	4cp

Stage 9

Autumn semester

977110	In-country Study 1: China	24cp

Stage 10

Spring semester

978110	In-country Study 2: China	24cp

Stage 11

Autumn semester

99584	Clinical Features of Disease	6cp
99630	Clinical Practice 1	12cp
99629	Chinese Medical Classics	4cp

Stage 12

Spring semester

99625	Research Methods	6cp
99631	Clinical Practice 2	12cp
99591	Practice Management	4cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, seminar presentations, and clinic practice evaluations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Professional recognition

Graduates of this course qualify for professional membership of most Australasian Chinese medicine professional associations.

Other information

All academic inquiries for the Science component of this program should be made to:

Course Director, Traditional Chinese Medicine
Mr Chris Zaslawski
Department of Health Sciences
Faculty of Science
telephone (02) 9514 7856, (02) 9514 2500
fax (02) 9514 7866
email Chris.Zaslawski@uts.edu.au

Any inquiries relating to the International Studies component of this course should be directed to the Institute for International Studies, telephone (02) 9514 1574.

Combined degree students are required to confirm, during the University enrolment period, the subjects they intend to take for the year with the Institute at 10 Quay Street, Haymarket, Sydney.

Bachelor of Science in Mathematics, Bachelor of Arts in International Studies

- UTS course code: C10156 (pre-2003: MM05)
- UAC code: 609210
- Testamur title: Bachelor of Science in Mathematics
  Bachelor of Arts in International Studies
- Abbreviation: BSc BA
- Course Director: Dr Geoff Smith
- Course fee: HECS (local)
  $7,000 per semester (international)
- Total credit points: 240

Overview

This course combines the Bachelor of Science in Mathematics with the Bachelor of Arts in International Studies. Mathematics is integrated with a major in the language and culture of another country. Students spend the fourth year of study at a university overseas.

Course aims

The Mathematical Sciences component of the combined degree aims to provide students with a broad education in the field, to prepare graduates for professional practice in industry, commerce and government, and to provide the foundation for graduate studies and research. It provides great flexibility by allowing students to follow a course of study that best suits their interests and aspirations. It aims to help the students acquire sufficient experience and understanding in a broad range of mathematical disciplines to enable them to apply mathematical and computing techniques to industrial and commercial problems.

For further information, see the course outline for the Bachelor of Science in Mathematics in this handbook.

An Honours degree in Mathematics (with majors in Operations Research, Statistics and Mathematics), requiring an additional year of full-time study, is also available.

Course duration

Owing to timetabling constraints, the combined degree is only offered on a full-time basis over five years.

Course structure

The structure of the course is derived from the combination of the Bachelor of Science in Mathematics with the Bachelor of Arts in International Studies.

All arrangements currently in force for both the Bachelor of Science in Mathematics and the Bachelor of Arts in International Studies apply equally to the combined degree programs.

To graduate, a student is required to have completed 240 credit points: 144 credit points in Mathematics and 96 credit points in International Studies.

Mathematics component

The Mathematics component of the combined degree is structured in three distinct sections: core studies, a major in an area of the mathematical sciences, and an elective component, precisely as for the Bachelor of Science in Mathematics. The major is taken in the final (fifth) year of study.

The program for each of the majors corresponds precisely with that in the Bachelor of Science in Mathematics.

International Studies component

The Bachelor of Arts in International Studies requires undergraduates to study a major – a region or country – over a minimum of three years. In Sydney, students study Language and Culture for at least two years, followed by a period of study overseas.

In the International Studies program, students study one of the following countries or majors: Canada (Québec), Chile, China, France, Germany, Indonesia, Italy, Japan, Latino Studies (USA), Malaysia, Mexico, Spain, Switzerland and Thailand. There are two other majors available that permit students to pursue programs of study about and in countries where other arrangements have not already been made. The Heritage major permits students with significant prior knowledge of a particular language and culture to continue their study in countries such as Croatia, Greece, Hong Kong, Korea, Poland, Russia, Taiwan, the Philippines, Vietnam and others. The Independent Study major is available where a language is taught in Sydney and a program of In-country Study can be arranged.

Australia and the Asia–Pacific is only available as a major to international students. International students may access one of the other majors offered provided that the country they choose as their major is able to grant them a visa to study there. This needs to be determined prior to commencing subjects within the major. If a visa cannot be granted, then it is not possible to undertake the chosen major.

Students are admitted to the International Studies program with no guarantee of entry to a specific major, although every effort is made to meet students' preferences. The Institute reserves the right to allocate places in majors according to its resources and arrangements with overseas universities.

Each major includes 32 credit points (four 8-credit-point subjects) of instruction in Language and Culture; 8 credit points of study of Comparative Social Change; 8 credit points of study of Contemporary Society; and 48 credit points (two semesters) of study at a university or institution of higher education in the country of the major.

There are no prior language requirements for the International Studies component of this combined degree, except for programs within the Heritage major.

Arrangements for In-country Study

Students are required to complete all appropriate subjects in their combined degree, including four consecutive semesters of study of Language and Culture before proceeding to In-country Study.

The Institute for International Studies makes arrangements for students to spend two semesters of In-country Study at an institution of higher education in the country of their major. The costs of tuition at overseas universities and of travel between Sydney and the student's place of study are paid by UTS, except in cases where a scholarship has been awarded to a student with provision for these costs. Visa fees are also paid by UTS, and students are covered by the UTS Overseas Insurance Policy. Students undertaking the Heritage or Independent Study major may be required to bear some of the tuition costs at the overseas university. During their In-country Study, students continue to be enrolled at UTS and to pay HECS for their study.

Students must pay the costs of accommodation and other living expenses during their period of In-country Study. Students should be aware that the living costs vary from country to country and that in some countries, such as Japan, living costs are high.

The In-country Study is the key component of the International Studies program. It provides a unique opportunity for students to immerse themselves in the language and culture of another country through a learning program at a host university, through involvement in the life of the local community and through project work which is supervised by the Institute. Each student's individual study program depends on their level of language competence and the subjects and other learning experiences that are available at the host university. All students who undertake In-country Study must agree to the Institute's Conditions of Participation for In-country Study. Any study undertaken at the host university during the two semesters of In-country Study is part of the In-country Study experience. Students may not credit any subjects completed at their host university during the period of In-country Study towards the professional component of their combined degree.

Course program

Stage 1

Autumn semester

35100	Mathematical Practice	6cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp
35170	Introduction to Computing	6cp

Stage 2

Spring semester

35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp
3xxxx	Electives	12cp

Stage 3

Autumn semester

35212	Linear Algebra	6cp
35231	Differential Equations	6cp
971xxx	Language and Culture 1	8cp

Stage 4

Spring semester

35241	Optimisation 1	6cp
35252	Statistics 2	6cp
35281	Numerical Methods	6cp
972xxx	Language and Culture 2	8cp

Stage 5

Autumn semester

35111	Discrete Mathematics	6cp
50140	Comparative Social Change	8cp
973xxx	Language and Culture 3	8cp
3xxxx	Elective	6cp

Stage 6

Spring semester

35232	Advanced Calculus	6cp
974xxx	Language and Culture 4	8cp
976xxx	Contemporary Society	8cp

Stage 7

Autumn semester

977xxx	In-country Study 1	24cp

Spring semester

978xxx	In-country Study 2	24cp

Stage 8

Autumn semester

35321	Analysis 1	6cp
353xx	Mathematics major 1	6cp
353xx	Mathematics major 2	6cp
3xxxx	Electives	12cp

Stage 9

Spring semester

353xx	Mathematics major 3	6cp
353xx	Mathematics major 4	6cp
3xxxx	Electives	12cp

Other information

All inquiries should be made to:

Course Director, Bachelor of Science in Mathematics, Bachelor of Arts in International Studies
Dr Geoff Smith
Department of Mathematical Sciences
telephone (02) 9514 2236
fax (02) 9514 1540
email Geoff.H.Smith@uts.edu.au

Any inquiries relating to the International Studies component of this course should be directed to the Institute for International Studies, telephone (02) 9514 1574.

Combined degree students are required to confirm, during the University enrolment period, the subjects they intend to take for the year with the Institute at 10 Quay Street, Haymarket, Sydney.

Bachelor of Mathematics and Finance, Bachelor of Arts in International Studies

- UTS course code: C10157 (pre-2003: MM06)
- UAC code: 609220
- Testamur title: Bachelor of Mathematics and Finance
  Bachelor of Arts in International Studies
- Abbreviation: BMathFin BA
- Course Director: Dr Layna Groen
- Course fee: HECS (local)[1]
- Total credit points: 240

Overview

This course combines the Bachelor of Mathematics and Finance with the Bachelor of Arts in International Studies. Studies in mathematics and finance are integrated with a major in the language and culture of another country. Students spend the fourth year of study at a university overseas.

Course aims

Students graduating from this degree will have undertaken an integrated sequence of study in mathematics, statistics, finance, economics, accounting and computing, and thus will have sound training in both the traditional theory of finance and the mathematical aspects of modern portfolio management techniques. With such skills, graduates should find interesting and rewarding employment in major financial institutions such as banks, insurance companies and government instrumentalities.

The Mathematics and Finance component of the course occupies three full-time years. An Honours degree, leading to the qualification of BMathFin(Hons) and requiring an additional year of full-time study, is also available.

Course duration

Because of timetabling constraints, the combined degree is available only on a full-time basis over five years.

Course structure

The structure of the course is derived from the combination of the Bachelor of Mathematics and Finance with the Bachelor of Arts in International Studies.

All arrangements in force for both the Bachelor of Mathematics and Finance and the Bachelor of Arts in International Studies apply equally to the combined degree programs.

To graduate, a student is required to have completed 240 credit points: 144 credit points in Mathematics and Finance and 96 credit points in International Studies.

Mathematics and Finance component

The Mathematics and Finance component of the course includes an integrated sequence of subjects in mathematics, statistics, finance, economics, accounting and computing.

International Studies component

The Bachelor of Arts in International Studies requires undergraduates to study a major – a region or country – over a minimum of three years. In Sydney, students study Language and Culture for at least two years, followed by a period of study overseas.

In the International Studies program, students study one of the following countries or majors: Canada (Québec), Chile, China, France, Germany, Indonesia, Italy, Japan, Latino Studies (USA), Malaysia, Mexico, Spain, Switzerland and Thailand. There are two other majors available that permit students to pursue programs of study about and in countries where other arrangements have not already been made. The Heritage major permits students with significant prior knowledge of a particular language and culture to continue their study in countries such as Croatia, Greece, Hong Kong, Korea, Poland, Russia, Taiwan, the Philippines, Vietnam and others. The Independent Study major is available where a language is taught in Sydney and a program of In-country Study can be arranged.

Australia and the Asia–Pacific is only available as a major to international students. International students may access one of the other majors offered provided that the country they choose as their major is able to grant them a visa to study there. This needs to be determined prior to commencing subjects within the major. If a visa cannot be granted, then it is not possible to undertake the chosen major.

Students are admitted to the International Studies program with no guarantee of entry to a specific major, although every effort is made to meet students' preferences. The Institute reserves the right to allocate places in majors according to its resources and arrangements with overseas universities.

[1] This course is not offered to international students. However, this policy is currently under review.

Each major includes 32 credit points (four 8-credit-point subjects) of instruction in Language and Culture; 8 credit points of study of Comparative Social Change; 8 credit points of study of Contemporary Society; and 48 credit points (two semesters) of study at a university or institution of higher education in the country of the major.

There are no prior language requirements for the International Studies component of this combined degree, except for programs within the Heritage major.

Arrangements for In-country Study

Students are required to complete all appropriate subjects in their combined degree, including four consecutive semesters of study of Language and Culture before proceeding to In-country Study.

The Institute for International Studies makes arrangements for students to spend two semesters of In-country Study at an institution of higher education in the country of their major. The costs of tuition at overseas universities and of travel between Sydney and the student's place of study are paid by UTS, except in cases where a scholarship has been awarded to a student with provision for these costs. Visa fees are also paid by UTS, and students are covered by the UTS Overseas Insurance Policy. Students undertaking the Heritage or Independent Study major may be required to bear some of the tuition costs at the overseas university. During their In-country Study, students continue to be enrolled at UTS and to pay HECS for their study.

Students must pay the costs of accommodation and other living expenses during their period of In-country Study. Students should be aware that the living costs vary from country to country and that in some countries, such as Japan, living costs are high.

The In-country Study is the key component of the International Studies program. It provides a unique opportunity for students to immerse themselves in the language and culture of another country through a learning program at a host university, through involvement in the life of the local community and through project work which is supervised by the Institute. Each student's individual study program depends on their level of language competence and the subjects and other learning experiences that are available at the host university. All students who undertake In-country Study must agree to the Institute's Conditions of Participation for In-country Study. Any study undertaken at the host university during the two semesters of In-country Study is part of the In-country Study experience. Students may not credit any subjects completed at their host university during the period of In-country Study towards the professional component of their combined degree.

Course program

Stage 1

Autumn semester

22107	Accounting for Business	6cp
25115	Economics for Business	6cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp

Stage 2

Spring semester

79203	Business Law and Ethics	6cp
25300	Fundamentals of Business Finance	6cp
35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp

Stage 3

Autumn semester

35170	Introduction to Computing	6cp
35212	Linear Algebra	6cp
25556	The Financial System	6cp
971xxx	Language and Culture 1	8cp

Stage 4

Spring semester

25410	Corporate Financial Analysis	6cp
35252	Statistics 2	6cp
35241	Optimisation 1	6cp
972xxx	Language and Culture 2	8cp

Stage 5

Autumn semester

35111	Discrete Mathematics	6cp
50140	Comparative Social Change	8cp
973xxx	Language and Culture 3	8cp

Stage 6

Spring semester

25906	Portfolio Theory and Investment Analysis (Advanced)	6cp
974xxx	Language and Culture 4	8cp
976xxx	Contemporary Society	8cp

Stage 7

Autumn semester

977xxx	In-country Study 1	24cp

Stage 8

Spring semester

978xxx	In-country Study 2	24cp

Stage 9

Autumn semester

35231	Differential Equations	6cp
25620	Derivative Securities	6cp
35321	Analysis 1	6cp
35353	Regression Analysis	6cp

Stage 10

Spring semester

25905	Capital Budgeting and Valuation (Advanced)	6cp
25606	Financial Time Series	6cp
35281	Numerical Methods	6cp
35361	Probability and Stochastic Processes	6cp

Other information

All inquiries should be made to:

Course Director, Bachelor of Mathematics and Finance, Bachelor of Arts in International Studies
Dr Layna Groen
Department of Mathematical Sciences
telephone (02) 9514 2266
fax (02) 9514 2248
email Layna.Groen@uts.edu.au

Any inquiries relating to the International Studies component of this course should be directed to the Institute for International Studies, telephone (02) 9514 1574.

Combined degree students are required to confirm, during the University enrolment period, the subjects they intend to take for the year with the Institute at 10 Quay Street, Haymarket, Sydney.

RECOMMENDED SCIENCE STRANDS

These programs are indicative rather than prescriptive. Students may, with the approval of the Associate Dean or relevant Head of Department, undertake alternative programs in order to fulfil the academic requirements for the degree.

The exact order in which the subjects are undertaken may vary depending upon timetable constraints and the number of science and law subjects each student elects to study in any one semester. Note: Quotas on some of the subjects shown below may restrict enrolment.

Strands for Science/Business and Science/Law

Applied Chemistry (96 credit points)

65101	Chemistry 1C	6cp
68101	Foundations of Physics	6cp
65201	Chemistry 2C	6cp
68201	Physics in Action (Physics 2)	6cp
33190	Mathematical Modelling for Science	6cp
65410	Chemical Safety and Legislation	6cp
65411	Inorganic Chemistry 1 (Transition Metal Chemistry)	6cp
65306	Analytical Chemistry 1	6cp
65409	Analytical Chemistry 2	6cp
65202	Organic Chemistry 1	6cp
65307	Physical Chemistry 1	6cp
65606	Analytical Chemistry 3	6cp
65607	Physical Chemistry 2	6cp
65508	Organic Chemistry 2 (Structure Elucidation and Synthesis)	6cp
65509	Inorganic Chemistry 2 (New Inorganic Materials)	6cp
xxxxx	Science elective	6cp

Applied Physics (96 credit points)

33190	Mathematical Modelling for Science	6cp
68101	Foundations of Physics	6cp
33290	Computing and Mathematics for Science	6cp
68201	Physics in Action (Physics 2)	6cp
33xxx	Mathematics for Physical Science	6cp
68xxx	Imaging Science	6cp
68xxx	Introduction to Computational Science	6cp
68xxx	Quantum Technology	6cp
68411	Vibrations, Quanta and Nucleons (Physics 4)	6cp
68312	Electrotechnology and Data Analysis	6cp
68314	Electronics	6cp
68512	Research Methods in Applied Physics	6cp
68611	Electromagnetics and Optics	6cp
68511	Quantum and Solid-state Physics	6cp
68514	Electronics and Interfacing	6cp
xxxxx	Science elective	6cp

Biomedical Science (96 credit points)

91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp
65101	Chemistry 1C	6cp
91702	Medical Science 2	6cp
65201	Chemistry 2C	6cp
91313	Biochemistry 1	6cp
91320	Biochemistry 2	6cp
91326	Analytical Biochemistry	6cp
91314	General Microbiology	6cp
91330	Epidemiology and Public Health Microbiology	6cp
91354	Anatomical Pathology	6cp
91351	Immunology 1	3cp
91355	Haematology 1	3cp
xxxxx	Designated Biomedical Science electives	24cp

Biotechnology (96 credit points)

91101	Cells, Genetics and Evolution	6cp
91320	Biochemistry 2	6cp
91142	Biotechnology	6cp
91701	Medical Science 1	6cp
91702	Medical Science 2	6cp
65101	Chemistry 1C	6cp
91313	Biochemistry 1	6cp
91314	General Microbiology	6cp
65201	Chemistry 2C	6cp
91326	Analytical Biochemistry	6cp
91132	Molecular Biology 1	6cp
91369	Biobusiness and Environmental Biotechnology	8cp
91335	Molecular Biology 2	8cp
91368	Bioreactors and Bioprocessing	8cp
91128	Plant Biotechnology	3cp
91351	Immunology 1	3cp

Environmental Biology (96 credit points)

91101	Cells, Genetics and Evolution	6cp
65101	Chemistry 1C	6cp
91102	Functional Biology	6cp
65201	Chemistry 2C	6cp
91110	Experimental Design and Sampling	6cp
33112	Statistical Design and Analysis Part A	3cp
33113	Statistical Design and Analysis Part B	3cp
91111	Pollution Assessment	6cp
91395	Biocomputing	3cp
91270	Plant Physiology	6cp
91112	Ecological Principles and Modelling	6cp
91309	Australian Biota	6cp
91363	Animal Ecophysiology	6cp
91119	Terrestrial Ecosystems	6cp
91120	Mapping and Remote Sensing	6cp
91121	Aquatic Ecology	6cp
91122	Environmental Management	6cp
xxxxx	Elective	3cp

Forensic Biology (104 credit points)

91313	Biochemistry 1	6cp
68041	Physical Aspects of Nature	6cp
65012	Chemistry 1A	6cp
91701	Medical Science 1	6cp
91702	Medical Science 2	6cp
91314	General Microbiology	6cp
91132	Molecular Biology 1	6cp
33116	Statistical Design and Analysis	6cp
65241	Principles of Forensic Science	6cp
91320	Biochemistry 2	6cp
91326	Analytical Biochemistry	6cp
91137	DNA Profiling	6cp
91138	Investigation of Human Remains	6cp
65543	Crime Scene Investigation	6cp
79024	Complex Forensic Cases (Law)	6cp
91139	Complex Forensic Cases (Biology)	6cp

Medical Science (96 credit points)

91701	Medical Science 1	6cp
65101	Chemistry 1C	6cp
91702	Medical Science 2	6cp
91101	Cells, Genetics and Evolution	6cp
65201	Chemistry 2C	6cp
91704	Behavioural Sciences	6cp
68041	Physical Aspects of Nature	6cp
91313	Biochemistry 1	6cp
91703	Physiological Systems	6cp
91708	Psychophysiology	8cp
91707	Pharmacology 1	8cp
91709	Pharmacology 2	8cp
91705	Medical Devices and Diagnostics	6cp
91706	Neuroscience	8cp
xxxxx	Approved Science elective	4cp

Nanotechnology (96 credit points)

68101	Foundations of Physics	6cp
33112	Mathematical Modelling – Part A	3cp
33113	Mathematical Modelling – Part B	3cp
60103	Nanosciences 1	6cp
68201	Physics in Action (Physics 2)	6cp
65201	Chemistry 2C	6cp
60104	Nanosciences 2	6cp
60xxx	Scanned Probe and Electron Microscopy	6cp
68314	Electronics	6cp
68xxx	Quantum Technology	6cp
60xxx	Nanomaterials	6cp
91313	Biochemistry 1	6cp
33490	Computational Mathematics and Physics	6cp
60xxx	Approved Nanotechnology subjects	24cp

Strands for Science/Engineering

Applied Chemistry (78 credit points)

65101	Chemistry 1C	6cp
65201	Chemistry 2C	6cp
65202	Organic Chemistry 1	6cp
65306	Analytical Chemistry 1	6cp
65307	Physical Chemistry 1	6cp
65409	Analytical Chemistry 2	6cp
65410	Chemical Safety and Legislation	6cp
65411	Inorganic Chemistry 1 (Transition Metal Chemistry)	6cp
65508	Organic Chemistry 2 (Structure Elucidation and Synthesis)	6cp
65509	Inorganic Chemistry 2 (New Inorganic Materials)	6cp
65606	Analytical Chemistry 3	6cp
65607	Physical Chemistry 2	6cp
xxxxx	Science elective	6cp

Applied Physics (78 credit points)

65101	Chemistry 1C	6cp
65201	Chemistry 2C	6cp
68314	Electronics	6cp
68312	Electrotechnology and Data Analysis	6cp
68411	Vibrations, Quanta and Nucleons (Physics 4)	6cp
68514	Electronics and Interfacing	6cp
68511	Quantum and Solid-state Physics	6cp
68512	Research Methods in Applied Physics	6cp
68611	Electromagnetics and Optics	6cp
68xxx	Imaging Science	6cp
68xxx	Introduction to Computational Science	6cp
68xxx	Quantum Technology	6cp
xxxxx	Science elective	6cp

Biomedical Science (78 credit points)

65101	Chemistry 1C	6cp
91701	Medical Science 1	6cp
65201	Chemistry 2C	6cp
91702	Medical Science 2	6cp
	and at least 30 credit points from	
91313	Biochemistry 1	6cp
91314	General Microbiology	6cp
91354	Anatomical Pathology	6cp
91320	Biochemistry 2	6cp
91326	Analytical Biochemistry	6cp
91330	Epidemiology and Public Health Microbiology	6cp
xxxxx	Biomedical Science electives	12cp

Biotechnology (85 credit points)

91101	Cells, Genetics and Evolution	6cp
91701	Medical Science 1	6cp
65101	Chemistry 1C	6cp
91702	Medical Science 2	6cp
65201	Chemistry 2C	6cp
91313	Biochemistry 1	6cp
91320	Biochemistry 2	6cp
91326	Analytical Biochemistry	6cp
91314	General Microbiology	6cp
91142	Biotechnology	6cp
91132	Molecular Biology 1	6cp
91369	Biobusiness and Environmental Biotechnology	8cp
	plus any one of the following	
91351	Immunology 1	3cp
91128	Plant Biotechnology	3cp
91335	Molecular Biology 2	8cp
91368	Bioreactors and Bioprocessing	8cp

Environmental Biology (78 credit points)

65101	Chemistry 1C	6cp
91101	Cells, Genetics and Evolution	6cp
65201	Chemistry 2C	6cp
91102	Functional Biology	6cp
91110	Experimental Design and Sampling	6cp
91111	Pollution Assessment	6cp
91270	Plant Physiology	6cp
91112	Ecological Principles and Modelling	6cp
91309	Australian Biota	6cp
91363	Animal Ecophysiology	6cp
91119	Terrestrial Ecosystems	6cp
91120	Mapping and Remote Sensing	6cp
91121	Aquatic Ecology	6cp

Medical Science (80 credit points)

33130	Mathematical Modelling 1	6cp
65101	Chemistry 1C	6cp
68037	Physical Modelling	6cp
91701	Medical Science 1	6cp
91702	Medical Science 2	6cp
33230	Mathematical Modelling 2	6cp
65201	Chemistry 2C	6cp
91313	Biochemistry 1	6cp
91703	Physiological Systems	6cp
91704	Behavioural Sciences	6cp
91705	Medical Devices and Diagnostics	6cp
91707	Pharmacology 1	8cp
48270	Technology Assessment	6cp

Nanotechnology (78 credit points)

33xxx	Mathematics for Physical Sciences	6cp
68101	Foundations of Physics	6cp
60103	Nanosciences 1	6cp
68201	Physics in Action (Physics 2)	6cp
65201	Chemistry 2C	6cp
33290	Computing and Mathematics for Science	6cp
60104	Nanosciences 2	6cp
60xxx	Scanned Probe and Electron Microscopy	6cp
68xxx	Quantum Technology	6cp
60xxx	Nanomaterials	6cp
91313	Biochemistry 1	6cp

SECOND MAJORS

Students enrolled in the Bachelor of Science, Bachelor of Medical Science, Bachelor of Science in Biomedical Science and Bachelor of Biotechnology degrees in the Faculty of Science are normally expected to undertake a second major as part of their course. Each second major comprises a coherent sequence of subjects offered by the Faculty of Science, another faculty of the University, or the Institute for International Studies. The purpose of the second major is to give students the opportunity to broaden their studies into other areas of interest or to pursue studies in particular disciplines to greater depth.

Examples of possible second majors are listed below but it should be noted that not all of them are necessarily appropriate to every course and that normal prerequisite conditions and timetabling constraints apply in all cases. In addition quotas may be applied to the forensic biology subjects specified below. Students should consult their Course Directors for advice on selecting second major strands. Students should note that second major titles cannot be identified on testamurs.

Faculty of Science

Applied Chemistry (24 credit points)

65202	Organic Chemistry 1	6cp
65306	Analytical Chemistry 1	6cp
65409	Analytical Chemistry 2	6cp
65508	Organic Chemistry 2 (Structure Elucidation and Synthesis)	6cp

Applied Physics (24 credit points)

68101	Foundations of Physics	6cp
68201	Physics in Action (Physics 2)	6cp
68xxx	Imaging Science	6cp
68411	Vibrations, Quanta and Nucleons (Physics 4)	6cp

Biochemistry (24 credit points)

This second major is suitable for students in the Physical, Chemical and Environmental Sciences courses.

91313	Biochemistry 1	6cp
91320	Biochemistry 2	6cp
91326	Analytical Biochemistry	6cp
91344	Medical and Diagnostic Biochemistry	8cp

Biomedical Science (minimum 24 credit points)

91313	Biochemistry 1	6cp
91314	General Microbiology	6cp
91132	Molecular Biology	6cp
	plus two or more of the following	
91320	Biochemistry 2	6cp
91330	Epidemiology and Public Health	6cp
91351	Immunology 1	3cp

Biotechnology (24 credit points)

91142	Biotechnology	6cp
91132	Molecular Biology	6cp
91369	Biobusiness and Environmental Biotechnology	6cp
91368	Bioreactors and Bioprocessing	6cp

Earth Science (minimum 24 credit points)

66101	Earth Science 1	6cp
66204	Field Studies 1	6cp
66304	Earth Materials	6cp
	plus one or more of the following	
66408	Earth Resources	6cp
66409	Surficial Processes and Products	6cp
66611	Engineering and Groundwater Geology	6cp
66609	Environmental and Quaternary Geology	6cp
91120	Mapping and Remote Sensing	6cp
xxxxx	Geochemistry/organic geochemistry elective for SUCOGG	6cp

Electronics and Computer Interfacing (24 credit points)

This second major is of particular benefit to scientists who need to measure and record data from instrumentation using a microcomputer. This subject major progresses from digital electronic circuitry to microcomputer architecture, and then to transducers and devices necessary for interfacing to the real world.

68101	Foundations of Physics[1]	6cp
68201	Physics in Action (Physics 2)	6cp
68314	Electronics	6cp
68514	Electronics and Interfacing	6cp

[1] Students with a sufficiently strong background may substitute 68312 Electrotechnology and Data Analysis (prerequisite 68201 Physics in Action (Physics 2)) for this subject.

Environmental Biology (24 credit points)

91101	Cells, Genetics and Evolution	6cp
91102	Functional Biology	6cp
91110	Experimental Design and Sampling	6cp
91112	Ecological Principles and Modelling	6cp

Environmental Horticulture (24 credit points)

91101	Cells, Genetics and Evolution	6cp
91246	Plant Structure, Function and Culture	6cp
91247	Landscape Design and Plant Culture	6cp
91233	Plant Production and Growing Systems	6cp

Experimental Methods in Applied Science (minimum 24 credit points)

This second major provides students with skills in optical instrumentation, temperature measurement, vacuum technology, electromagnetic techniques, X-ray analysis, electron microscopy and scientific data analysis.

68201	Physics in Action	6cp
	plus three or more of the following	
68xxx	Imaging Science	6cp
68312	Electrotechnology and Data Analysis	6cp
68xxx	Quantum Technology	6cp
68512	Research Methods in Applied Physics	6cp

Haematology (31 credit points)

91313	Biochemistry 1	6cp
91354	Anatomical Pathology	6cp
91355	Haematology 1	3cp
91358	Haematology 2	8cp
91129	Transfusion Science	8cp

Immunology (23 credit points)

This second major is suitable for students in the Physical, Chemical and Environmental Sciences courses.

91313	Biochemistry 1	6cp
91314	General Microbiology	6cp
91351	Immunology 1	3cp
91359	Immunology 2	8cp

Materials Science (24 credit points)

65062	Extractive Metallurgy	6cp
67101	Introduction to Materials	6cp
67305	Polymer Science	6cp
67508	Surface Chemistry of Materials	6cp

Mathematics (24 credit points)

This second major is suitable for students in Physical Chemical, Earth Science programs.

35101	Mathematics 1	6cp
35102	Mathematics 2	6cp
35212	Linear Algebra[1]	6cp
35231	Differential Equations	6cp

[1] The subject 25406 Quantitative Techniques for Finance and Economics is accepted as a prerequisite for 35212 Linear Algebra. Otherwise, students must substitute 35140 Operations Research Modelling for 35231 Differential Equations.

Medical Science (minimum 24 credit points)

91313	Biochemistry 1	6cp
91314	General Microbiology	6cp
91701	Medical Science 1	6cp
91702	Medical Science 2	6cp
	plus two or more of the following	
91703	Physiological Systems	6cp
91704	Behavioural Sciences	6cp
91705	Medical Devices and Diagnostics	6cp

Microbiology (26 credit points)

This second major is suitable for students in the Physical, Chemical and Environmental Sciences courses.

91314	General Microbiology	6cp
91330	Epidemiology and Public Health Microbiology	6cp
	plus any two of the following	
91132	Molecular Biology 1	6cp
91338	Clinical Bacteriology	8cp
91352	Parasitology	8cp

Molecular Biology (24 credit points)

This second major is suitable for students in the Physical, Chemical and Environmental Sciences courses.

91313	Biochemistry 1	6cp
91314	General Microbiology	6cp
91132	Molecular Biology 1	6cp
91335	Molecular Biology 2	8cp

Nanotechnology (24 credit points)

The second major is for students in the Physical, Chemical and Environmental Sciences courses:

60103	Nanosciences 1	6cp
60104	Nanosciences 2	6cp
60xxx	Scanning Probe and Electron Microscopy	6cp
60xxx	Nanomaterials	6cp

Neurophysiology (30 credit points)

(for non-BMedSc courses)

91703	Physiological Systems	6cp
91704	Behavioural Sciences	6cp
91706	Neuroscience	8cp
91708	Psychophysiology	8cp

Occupational Health and Safety Management (24 credit points)

69341	Risk Management	6cp
69312	Occupational Hazard Analysis	6cp
69342	Legal Aspects of Occupational Health and Safety	3cp
69345	Occupational Health and Safety Management	3cp
	plus any 6 credit points from the following	
69323	Human Factors/Ergonomic Design	3cp
69332	Chemical Safety Management	3cp
69335	People and the Physical Environment	3cp
69336	Evaluating Occupational Health and Safety (Construction Industry)	6cp
69338	Biological Hazards and Toxicology	6cp

Operations Research (24 credit points)

This second major assumes students have completed 33190 Mathematical Modelling for Science and 33290 Computing and Mathematics for Science.

35140	Operations Research Modelling	6cp
35241	Optimisation 1	6cp
	plus any two of the following	
35342	Optimisation 2	6cp
35363	Simulation Modelling	6cp
35344	Network Optimisation	6cp

Operations Theory and Applications (24 credit points)

This sub-major is intended to expose students to the theory and practice of operations research with application in an area of information technology, in particular: optimisation techniques, network optimisation or simulation techniques.

35140	Operations Research Modelling	6cp
33401	Introductory Mathematical Methods	6cp
35241	Optimisation 1	6cp
	and one of the following	
35342	Optimisation 2	6cp
35344	Network Optimisation	6cp
35363	Simulation Modelling	6cp

Physics (General) (24 credit points)

This sub-major provides a grounding in general physics. It is of benefit to students contemplating a career in the programming of scientific and engineering problems.

68101	Foundations of Physics	6cp
68201	Physics in Action (Physics 2)	6cp
	plus two of the following	
68xxx	Imaging Science	6cp
68xxx	Quantum Technology	6cp
68411	Vibrations, Quanta and Nucleons (Physics 4)	6cp

Pharmacology (22 credit points)

This second major is for students in the Biomedical Science and Biotechnology courses.

91703	Physiological Systems	6cp
91707	Pharmacology 1	8cp
91709	Pharmacology 2	8cp

Quantitative Methods (24 credit points)

This sub-major is intended to expose students to the theory and application of quantitative methods that are widely used by information technology professionals, especially techniques drawn from the disciplines of statistics and management science.

35140	Operations Research Modelling	6cp
35151	Statistics 1	6cp
33401	Introductory Mathematical Methods	6cp
	plus one of the following	
35241	Optimisation 1	6cp
35252	Statistics 2	6cp

Scientific Computing (24 credit points)

This sub-major is intended to expose students to the theory and practice of computing as applied in the area of computational science.

35363	Simulation Modelling	6cp
35401	Introductory Mathematical Methods	6cp
35281	Numerical Methods	6cp
35383	High Performance Computing	6cp

Statistics (24 credit points)

This second major is suitable for students in biological or environmental sciences who have completed 33101 Mathematics 1 (Life Sciences) and 33112 Statistical Design and Analysis.

33401	Introductory Mathematical Methods	6cp
35252	Statistics 2	6cp
	plus any two of the following	
35353	Regression Analysis	6cp
35355	Quality Control	6cp
35356	Design and Analysis of Experiments	6cp
35361	Probability and Stochastic Process	6cp

This second major is suitable for students in Physical and Chemical programs, and assumes they have completed 33190 Mathematical Modelling for Science and 33290 Computing and Mathematics for Science.

35151	Statistics 1	6cp
35252	Statistics 2	6cp
	plus any two of the following	
35353	Regression Analysis	6cp
35355	Quality Control	6cp
35356	Design and Analysis of Experiments	6cp
35361	Probability and Stochastic Processes	6cp

Statistical Modelling and Applications (24 credit points)

This sub-major is intended for expose students to the theory and practice of statistical modelling.

33401	Introductory Mathematical Methods	6cp
35151	Statistics 1	6cp
35252	Statistics 2	6cp
	plus one of the following	
35353	Regression Analysis	6cp
35355	Quality Control	6cp
35356	Design and Analysis of Experiments	6cp
35361	Probability and Stochastic Processes	6cp

Faculty of Business

Management Practice (24 credit points)

This second major is designed for students who wish to gain knowledge of the management process, including management and communication skills, employment relations practice, management of business processes and managing the strategy process.

21131	Business Process Management	6cp
21306	Employment Relations in the Global Context	6cp
21440	Management Skills	6cp
21630	Management of the Strategy Process	6cp

Small and Medium Enterprise Management (24 credit points)

This second major prepares students for a management role in the small and medium enterprise business sector by providing an understanding of the peculiarities of small and new businesses, which differentiate them from large corporations and government enterprises. It is offered at the City campus on demand and partially at the Kuring-gai campus on demand.

21082	Small and Medium Enterprise Management	6cp
21131	Business Process Management	6cp
21409	Entrepreneurship and Innovation	6cp
22566	Accounting for Small Business 1	6cp

Leisure Management (24 credit points)

This second major provides an understanding of the role of leisure in contemporary society, focusing on the management and marketing of leisure services. It is offered at the Kuring-gai campus only.

27126	Leisure in Australia	6cp
27216	Leisure Services Management	6cp
27523	Leisure and Tourism Planning	6cp
	plus one of the following	
27179	Festivals and Special Events	6cp
27306	Marketing of Leisure Services	6cp
27316	Leisure and Fitness Centre Operations	6cp
27628	Law for Leisure, Sport and Tourism	6cp

Tourism Management (24 credit points)

This second major provides students with a systematic framework for understanding the tourism phenomenon in Australia. It is offered at the Kuring-gai campus only.

27184	Introduction to Tourism Systems	6cp
27648	The Tourism Industry	6cp
27706	Tourism Strategy and Operations	6cp
	plus one of the following	
27185	Introduction to Tourist Behaviour	6cp
27523	Leisure and Tourism Planning	6cp
27628	Law for Leisure, Sport and Tourism	6cp
27642	Tourism Marketing	6cp

Faculty of Education

Second majors are available through the Faculty of Education in the following areas:

- Art
- Educational Computing
- Education
- English
- History
- Music
- Personal Development, Health and Physical Education.

For further information see the 2003 handbook for the Faculty of Education, or the online version at:

www.uts.edu.au/div/publications/edu/index.html

Faculty of Engineering and/or Faculty of Information Technology

Computing and Computer Systems (24 credit points)

An individually designed second major in computing and/or computer systems for students in Applied Physics programs can be arranged in consultation with the Course Director of the Applied Physics program and, where necessary, appropriate staff from the Faculty of Engineering or the Faculty of Information Technology. These subjects are normally taken after completing the core computing subjects taken by all applied physics students.

Example 1

48440	Software Engineering	6cp
48450	Operating Systems	6cp
48451	Advanced Digital Systems	6cp
48570	Data Acquisition and Distribution	6cp

Example 2

	24 credit points or more from the following	
31415	Principles of Software Development A	6cp
31425	Principles of Software Development B	6cp
31436	Systems Software and Networks	6cp
31428	Quantitative Modelling	6cp
31429	Procedural Programming	6cp
31748	Programming on the Internet	4cp
31904	Systems Programming	4cp

Faculty of Humanities and Social Sciences

Communication and Information (minimum 24 credit points)

	three or more of the following	
50124	Information Needs and Uses	8cp
50125	Communication and Audience	8cp
50126	Information and the Organisation	8cp
50127	International Communication	8cp
50128	Media, Information and the Law	8cp
50129	News and Current Affairs	8cp
50483	Strategic Organisational Communication	8cp
50179	Virtual Communities	8cp
50226	Communication and Information Environments	8cp
50227	Media, Information and Society	8cp

Information (minimum 24 credit points)

	three or more of the following	
50143	Research Methods and Data Analysis	8cp
50144	Organising and Retrieving Information	8cp
50146	Internet and Electronic Information Networking	8cp
50223	Information Resources	8cp
50232	Information in Society	8cp

Public Communication (minimum 24 credit points)

	three or more of the following	
50161	Advertising Production and Criticism	8cp
50162	Advertising Communication Strategies	8cp
50238	Public Communication Processes	8cp
50239	Public Communication Challenges	8cp
50159	Public Relations Principles	8cp
50160	Public Relations Strategies	8cp

Electives are also available in the following areas:

- Communication and English Language Studies
- Cultural Studies
- Journalism
- Social Inquiry
- Social, Political and Historical Studies
- Writing.

See the 2003 handbook for the Faculty of Humanities and Social Sciences for further information, or the online version at:

www.uts.edu.au/div/publications/hss/index.html

or

telephone (02) 9514 2300

POSTGRADUATE COURSES

GENERAL INFORMATION

The Faculty offers both PhD and Master's programs by research and thesis. There are also several Master's by coursework, Graduate Diploma, and Graduate Certificate courses. Brief outlines of the programs are provided below. Prospective students should discuss possible topics of research with the Head of the appropriate department in the first instance. For further formal information, they should consult the University Graduate School information booklet and individual brochures.

Fees

Research degrees are offered on a sponsored, scholarship, faculty part-sponsored, or full fee-paying basis. Students should contact the Faculty, or the University Graduate School for further details. UTS Union and Students' Association fees are payable at enrolment.

Graduate Diplomas

For Graduate Diploma courses, exemptions from subjects may be granted if a student can provide documented evidence of completed formal tertiary studies or recognised prior learning in the area. Exemptions are granted at the discretion of the Course Director who makes a recommendation to the Faculty of Science Courses Committee. Total exemptions cannot exceed a maximum of 50 per cent of the total credit points of the program. Exemptions may be granted for subjects previously completed at the undergraduate and postgraduate level, but the maximum exemptions granted for undergraduate subjects cannot exceed 25 per cent of the total credit points of the program.

Requirements for student progression

Students enrolled in a Graduate Diploma who fail in any two subjects, or any one subject twice, will be seen as making unsatisfactory progress and will have their registration discontinued. Students may appeal against such discontinuation of registration under Rule 3.2.7, see the *UTS: Calendar*, or online at:

www.uts.edu.au/div/publications/policies/rules/contents.html

POSTGRADUATE DEGREES BY COURSEWORK

Graduate Certificate in Pilates Method

- UTS course code: C11151 (pre-2003: NH53)
- Testamur title: Graduate Certificate in Pilates Method
- Abbreviation: none
- Course Director: Denise Edwards
- Course fee: $3,600 (local)[1]
- Total credit points: 24

Overview

The Pilates Method is a full body conditioning program that uses floor work, spring-loaded equipment and light weights to develop a strong, centred, muscularly balanced and flexible body, dynamic spinal alignment and postural control, and increased mental awareness of the body. It is divided in its application into two streams – fitness development and post-acute rehabilitation. This course addresses fitness development.

Course aims

The purpose of this course is to provide students with a graduate certificate that enhances their current fitness, coaching, and personal training skills, and prepares them to work in existing Pilates Method studies or in liaison with other health professionals to develop programs for client health.

Admission requirements

Educational requirements

Applicants require: either an undergraduate degree in a relevant discipline, or a diploma in a relevant field along with appropriate work experience. The qualification includes at least one year of tertiary-level study of Anatomy and Physiology.

Professional requirements

Applicants require: a minimum of 50 hours personal Pilates practice with a qualified practitioner; and a current first aid certificate with CPR.

[1] This course is not offered to international students.

Course duration

This course is offered on a one-year, part-time basis.

Course structure

Each semester students complete two subjects. The Foundation subjects provide formal tuition in lecture/tutorial/practical session mode. The Professional Training subjects incorporate the following:

- a total of 180 hours practice of Pilates with a qualified instructor, and
- a total of 200 hours supervised professional practice in an accredited Pilates Method studio as organised with UTS after enrolment.

Course program

Autumn

91801	Foundations of Pilates Method 1	6cp
91898	Professional Training (Pilates Method) 1	6cp

Spring

91802	Foundations of Pilates Method 2	6cp
91xxx	Professional Training (Pilates Method) 2	6cp

Assessment

Students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, case studies and seminar presentations. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Professional recognition

This certificate qualifies students for membership of the Australian Pilates Method Association.

Other information

All academic inquiries should be made to:

Course Director, Graduate Certificate in Pilates Method
Denise Edwards
telephone (02) 9514 2489
fax (02) 9514 2228
email DA.Edwards@uts.edu.au

or

Peter Miller
telephone (02) 9514 2229
fax (02) 9514 2228
email Peter.Miller@uts.edu.au

Graduate Certificate in Pilates Method Rehabilitation

- UTS course code: to be advised
- Testamur title: Graduate Certificate in Pilates Method Rehabilitation
- Abbreviation: none
- Course Director: Denise Edwards
- Course fee: $4,000 (local)[1]
- Total credit points: 24

Overview

This course is specifically designed to produce Pilates Instructors qualified to practice independently and in a multidisciplinary fitness and clinical health environment. The course also provides health care professionals the opportunity to acquire the highest possible education in the Pilates Method, as well as providing graduates of Human Movement, Physiotherapy and related tertiary degree courses with a further professional vocation.

Course aims

The Graduate Certificate in Pilates Method Rehabilitation addresses the post-acute rehabilitation application of the Pilates Method. The course is designed to provide students the opportunity to build on their current Pilates fitness development skills to allow them to develop specialised skills in the application of the Pilates Method for rehabilitation (following sporting and other injuries, and in mobility conditions).

Students graduate with a range of skills including: physical skills required to be a Pilates Methods Instructor in the rehabilitation arena; knowledge of the philosophy of Pilates Method and the ability to apply knowledge from anatomical, physiological and pathophysiological principles to this philosophy; the ability to evaluate fitness and diagnose movement dysfunction in order to develop appropriate exercise programs in specific rehabilitation populations; a demonstrated understanding of a broad range of psychodynamic techniques, pain management and motivation/ compliance skills, concepts of motor learning, and the use of effective communication skills in the implementation of rehabilitation programs; the ability to

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1 This course is not offered to international students.

appropriately communicate and liaise with other health professionals and adhere to ethical standards. Graduates will be qualified senior instructors in the instruction of Pilates Method to clients and as such will be competent to demonstrate Pilates Method techniques to junior practitioners.

Admission requirements

Educational requirements

Applicants require the Graduate Certificate in Pilates Method or equivalent level-one training in the Pilates Method (see page 153).

Professional requirements

Applicants require a minimum of 250 hours personal Pilates practice with a qualified practitioner; a current first aid certificate with CPR; and current employment in an appropriate Pilates Method Studio of at least 20 hours per week.

Course duration

This course is offered on a one-year, part-time basis.

Course structure

Before qualifying for the Graduate Certificate in Pilates Method Rehabilitation students must complete the following concurrently with their formal studies:

- a total of 100 hours personal practice of Pilates with a qualified instructor, and
- a minimum of 1,000 hours of workplace placement with a supervised professional practice in an accredited Pilates Method studio where contact with rehabilitation cases is available. This will be organised in conjunction with UTS.

Course program[1]

Autumn

91xxx	Pilates Method (Rehabilitation) 1	6cp
91xxx	Professional Practice (Pilates Rehabilitation) 1	6cp

Spring

91xxx	Pilates Method (Rehabilitation) 2	6cp
91xxx	Professional Practice (Pilates Rehabilitation) 2	6cp

[1] At the time of printing, the final program is yet to be confirmed. Consult the online handbook for the Faculty of Science for the latest information at:
www.uts.edu.au/div/publications/sci/index.html

Assessment

Students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, case studies and seminar presentations. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Professional recognition

This certificate qualifies students for membership of the Australian Pilates Method Association.

Other information

All academic inquiries should be made to:

Course Director, Graduate Certificate in Pilates Methods
Denise Edwards
telephone (02) 9514 2489
fax (02) 9514 2228
email DA.Edwards@uts.edu.au

or

Peter Miller
Head, Department of Health Sciences
telephone (02) 9514 2229
fax (02) 9514 2228
email Peter.Miller@uts.edu.au

Graduate Certificate in Mathematical Sciences

- UTS course code: C11147 (pre-2003: MM56)
- Testamur title: Graduate Certificate in Mathematical Sciences
- Abbreviation: none
- Course Director: Peter Petocz
- Course fee: $4,920 (local)[1]
- Total credit points: 12

Overview

The Graduate Certificate in Mathematical Sciences has been developed in response to a demand for short courses in mathematics, statistics, operations research and computational mathematics. It provides those employed in industry with access to additional training or retraining in quantitative disciplines.

Admission requirements

Applicants are normally expected to hold a Bachelor's degree, or higher qualification, from a recognised tertiary institution. Applicants who do not possess such qualifications are considered on an individual basis. Prior to their admission, all applicants are required to discuss their preferred program of study with the Course Director for Postgraduate Programs (Mathematics) in order to ensure that they have the requisite background knowledge for their chosen subject sequences.

Course duration

The course is offered on a part-time basis over two semesters.

Course structure

The course has a flexible structure and the wide range of subjects offered in the other postgraduate and undergraduate courses in the Mathematical Sciences is available to intending students. Students may undertake any sequence of subjects offered by the Department with a total value of 12 credit points, provided that individual subject prerequisites are satisfied.

1 This course is not offered to international students.

Course program

A number of coherent subject sequences in the areas of mathematics, computational mathematics, operations research and statistics are possible. Samples of these are listed below. Some computing subjects require extra attendance for laboratory work. Details are given in the Subject Descriptions section of this handbook.

Computational mathematics

Sequence A
Theme: Elementary numerical methods

Presumed knowledge

Equivalent to introductory courses in calculus, linear algebra and differential equations, and an elementary knowledge of a symbolic algebra package such as *Mathematica*.

Program of study

35170	Introduction to Computing	6cp
35281	Numerical Methods	6cp

Sequence B
Theme: Numerical analysis

Presumed knowledge

Equivalent to introductory courses in calculus, linear algebra and differential equations, an elementary knowledge of the C language and a symbolic algebra package such as *Mathematica*.

Program of study

35281	Numerical Methods	6cp
35382	Numerical Analysis 2	6cp

Mathematics

Sequence A
Theme: Differential equations

Presumed knowledge

Equivalent to introductory courses in calculus and linear algebra.

Program of study

35102	Mathematics 2	6cp
35231	Differential Equations	6cp

Sequence B
Theme: Modern and linear algebra

Presumed knowledge

Equivalent to introductory courses in matrix algebra and discrete mathematics.

Program of study

35212	Linear Algebra	6cp
35314	Pure Mathematics 3B	6cp

Sequence C
Theme: Analysis with Applications to Probability Theory

Presumed knowledge

Equivalent to introductory courses in calculus, differential equations and linear algebra.

Program of study

35321	Analysis 1	6cp
35322	Analysis 2	6cp

Operations research

Sequence A
Theme: Financial modelling

Presumed knowledge

Equivalent to intermediate courses in calculus, linear algebra and statistics.

Program of study

35241	Optimisation 1	6cp
35340	Operations Research Practice	6cp

Sequence B
Theme: Techniques of mathematical programming

Presumed knowledge

Equivalent to intermediate courses in calculus and linear algebra.

Program of study

35241	Optimisation 1	6cp
35342	Optimisation 2	6cp

Sequence C
Theme: Simulation and decision support

Presumed knowledge

Equivalent to intermediate courses in calculus and statistics.

Program of study

35361	Probability and Stochastic Processes	6cp
35363	Simulation Modelling	6cp

Statistics

Sequence A
Theme: Analysis of experimental data

Presumed knowledge

Equivalent to introductory courses in calculus and statistics.

Program of study

35252	Statistics 2	6cp
35353	Regression Analysis	6cp

Sequence B
Theme: Industrial applications of statistics

Presumed knowledge

Equivalent to intermediate courses in calculus and statistics.

Program of study

35355	Quality Control	6cp
35361	Probability and Stochastic Processes	6cp

Sequence C
Theme: Mathematical statistics

Presumed knowledge

Equivalent to intermediate courses in calculus and statistics.

Program of study

35356	Design and Analysis of Experiments	6cp
35361	Probability and Stochastic Processes	6cp

Rules and regulations

Students will have their registration discontinued for failure to complete the course in three semesters from the time of registration in the case of a part-time student, or two semesters from that time in the case of a full-time student, not inclusive of periods of leave of absence (Rule 3.2.6.1).

Other information

All academic inquiries should be made to:

Course Director, Graduate Certificate in Mathematical Sciences
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Graduate Diploma in Statistics

- UTS course code: C07082 (pre-2003: MM65)
- Testamur title: Graduate Diploma in Statistics
- Abbreviation: GradDipStats
- Course Director: Dr Peter Petocz
- Course fee: $4,920 per semester (local)
  $7,000 per semester (international)
- Total credit points: 48

Overview

A knowledge of statistical methodology is becoming ever more important for graduates in many disciplines. Degree courses in the sciences, in engineering and in business often do not provide the exposure to statistics which graduates find they need in employment. This course is suitable for such graduates and also for those who have completed degrees in pure or applied mathematics without a major in statistics.

Course aims

The Graduate Diploma in Statistics aims to train graduates in the methods and principles of applied statistics. The course provides access to training or retraining in statistics to at least the level of skill attained by students completing the Bachelor of Science in Mathematics degree with the Statistics major. Students are expected to have some statistical and mathematical background.

Admission requirements

Applicants for this course are graduates from a variety of disciplines who satisfy the basic entry requirements. These consist of a knowledge of statistics and pure and applied mathematics equivalent to the subjects 35252 Statistics 2 and 35102 Mathematics 2. Prospective applicants are assessed by the Program Leader for Postgraduate Programs (Mathematics), and those who have not completed the necessary prerequisites are required to enrol in appropriate subjects, either as non-award students or as part of a Graduate Certificate in Mathematical Sciences.

Attendance

Part-time students should be aware that attendance at daytime classes for some subjects may be unavoidable.

Course duration

The course is offered on a full-time basis over two semesters, or on a part-time basis over four semesters.

Course structure

The subjects in the Graduate Diploma cover standard statistical techniques and their theoretical foundations. The range of topics and the level of presentation are commensurate with those found in senior undergraduate studies in this discipline.

Students are required to complete 48 credit points comprising five core subjects and three electives. Two of these elective subjects may be combined into a single 12-credit-point project extending over two semesters. It is also possible to choose Honours level subjects as electives, depending on satisfaction of prerequisites at a suitable level.

Course program

The program consists of the following subjects:

35170	Introduction to Computing	6cp
35353	Regression Analysis	6cp
35355	Quality Control	6cp
35356	Design and Analysis of Experiments	6cp
35361	Probability and Stochastic Processes	6cp
3xxxx	Electives	18cp

Rules and regulations

Students will have their registration discontinued for failure to complete the course in eight semesters from the time of registration in the case of a part-time student, or four semesters from that time in the case of a full-time student, not inclusive of periods of leave of absence (Rule 3.2.6.1), or for any three failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/94/80) (Rule 3.2.6.2).

Other information

All academic inquiries should be made to:

Course Director, Graduate Diploma in Statistics
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Graduate Diploma in Mathematics and Finance

- UTS course code: C06063 (pre-2003: MM66)
- Testamur title: Graduate Diploma in Mathematics and Finance
- Abbreviation: GradDipMathFin
- Course Director: Dr Peter Petocz
- Course fee: $4,920 per semester (local) $7,000 per semester (international)
- Total credit points: 48

Course aims

The Graduate Diploma in Mathematics and Finance is designed to allow suitable graduates in one area of mathematics, say statistics or pure mathematics, to be retrained so that they will have sufficient knowledge of relevant aspects of financial modelling to enable them to participate authoritatively in the area of finance.

Admission requirements

Students are expected to have a sound background equivalent to first-year university mathematics and statistics

Applicants for the Graduate Diploma should discuss their eligibility with the Program Leader for Postgraduate Programs (Mathematics). Those who have not completed the necessary prerequisites are required to enrol in appropriate subjects, either as non-award students or in a Graduate Certificate in Mathematical Sciences.

Attendance

Part-time students should be aware that attendance at daytime classes for some subjects may be unavoidable.

Course duration

The course is offered on a full-time basis over three semesters, or on a part-time basis over four semesters.

Course structure

The subjects in the Graduate Diploma range from necessary background material at undergraduate level through to Honours-level subjects in time series analysis and financial modelling. Exemptions from subjects, due to prior study, may be approved where warranted.

Students are required to complete 48 credit points comprising eight core subjects and one elective.

Course program

The program consists of the following subjects:

33401	Introductory Mathematical Methods	6cp
35252	Statistics 2	6cp
35361	Probability and Stochastic Processes	6cp
35384	Financial Modelling	6cp
35241	Optimisation 1	6cp
35353	Regression Analysis	6cp
35467	Time Series Analysis	4cp
35485	Advanced Financial Modelling	4cp
3xxxx	Elective	4cp

Rules and regulations

Students will have their registration discontinued for failure to complete the course in eight semesters from the time of registration in the case of a part-time student, or four semesters from that time in the case of a full-time student, not inclusive of periods of leave of absence (Rule 3.2.6.1), or for any three failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/94/80) (Rule 3.2.6.2).

Other information

All academic inquiries should be made to:

Course Director, Graduate Diploma in Mathematics and Finance
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Graduate Diploma in Applicable Mathematics

- UTS course code: C06064 (pre-2003: MM67)
- Testamur title: Graduate Diploma in Applicable Mathematics
- Abbreviation: GradDipApplicMath
- Course Director: Dr Peter Petocz
- Course fee: $4,920 per semester (local) $7,000 per semester (international)
- Total credit points: 48

Course aims

The Graduate Diploma in Applicable Mathematics is designed to offer suitably qualified graduates the background in mathematics required to pursue further studies in an area of mathematics, and particularly in the area of mathematical finance.

Admission requirements

Students are expected to have a sound background equivalent to second-year university mathematics and statistics

Applicants for the Graduate Diploma should discuss their eligibility with the Program Leader for Postgraduate Programs (Mathematics). Those who have not completed the necessary prerequisites are required to enrol in appropriate subjects, either as non-award students or in a Graduate Certificate in Mathematical Sciences (see page 156).

Attendance

Part-time students should be aware that attendance at daytime classes for some subjects may be unavoidable.

Course duration

The course is offered on a full-time basis over two semesters, or on a part-time basis over four semesters.

Course structure

The subjects in the Graduate Diploma include the necessary undergraduate mathematics background that will enable its graduates to proceed into the Bachelor of Mathematics and Finance (Honours) degree, provided an acceptable standard is reached. Exemption from some subjects, due to prior study, may be approved where warranted.

Students are required to complete 48 credit points, comprising seven core subjects and one elective. The elective is generally chosen from one of the major areas of Mathematics, Statistics or Operations Research, in the Bachelor of Science in Mathematics degree.

Course program

The course program consists of the following subjects:

35231	Differential Equations	6cp
35252	Statistics 2	6cp
35232	Advanced Calculus	6cp
35321	Analysis 1	6cp
35353	Regression Analysis	6cp
35322	Analysis 2	6cp
35361	Probability and Stochastic Processes	6cp
3xxxx	Elective	6cp

Rules and regulations

Students will have their registration discontinued for failure to complete the course in eight semesters from the time of registration in the case of a part-time student, or four semesters from that time in the case of a full-time student, not inclusive of periods of leave of absence (Rule 3.2.6.1), or for any three failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/94/80) (Rule 3.2.6.2).

Other information

All academic inquiries should be made to:

Course Director, Graduate Diploma in
Applicable Mathematics
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Graduate Diploma in Operations Research

- UTS course code: C07081 (pre-2003: MM52)
- Testamur title: Graduate Diploma in Operations Research
- Abbreviation: GradDipOR
- Course Director: Dr Peter Petocz
- Course fee: $4,920 per semester (local) $7,000 per semester (international)
- Total credit points: 48

Course aims

This course is designed to train professional people in the application of operations research principles and methods. It may be regarded as a training or retraining course for graduates from a wide range of disciplines, provided they have a sound foundation equivalent to first-year university mathematics, statistics and computing.

Admission requirements

Applicants for the Graduate Diploma program should discuss their eligibility with the Program Leader for Postgraduate Programs (Mathematics).

Attendance

For part-time students, attendance at daytime classes for some subjects may be unavoidable.

Course duration

The course is offered on a full-time basis over two semesters, or on a part-time basis over four semesters.

Course structure

The subjects in the Graduate Diploma cover standard operations research techniques and their theoretical foundations. The range of topics and the level of presentation are commensurate with those found in senior undergraduate studies in this discipline.

Students are required to complete 48 credit points comprising six core subjects and two electives. The two electives may be combined into a single 12-credit-point project taken over two semesters.

Course program

The program consists of the following subjects:

33401	Introductory Mathematical Methods	6cp
35241	Optimisation 1	6cp
35151	Statistics 1	6cp
35363	Simulation Modelling	6cp
35342	Optimisation 2	6cp
35340	Operations Research Practice	6cp
3xxxx	Electives	12cp

Articulation and progression

The course is ideally suited for subsequent entry into the Master of Science in Operations Research, provided a suitable standard is attained and the work experience requirement is satisfied.

Rules and regulations

Students will have their registration discontinued for failure to complete the course in eight semesters from the time of registration in the case of a part-time student, or four semesters from that time in the case of a full-time student, not inclusive of periods of leave of absence (Rule 3.2.6.1), or for any three failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/94/80) (Rule 3.2.6.2).

Other information

All academic inquiries should be made to:

Course Director, Graduate Diploma in Operations Research
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Master of Science in Operations Research

- UTS course code: C04164 (pre-2003: MM53)
- Testamur title: Master of Science in Operations Research
- Abbreviation: MSc
- Course Director: Dr Peter Petocz
- Course fee: $4,920 per semester (local) $7,750 per semester (international)
- Total credit points: 48

Overview

Operations research is also known as management science. It may be defined as the application of the methods of science to complex problems arising in the direction and management of large systems of people, materials and money in industry, business, government and defence. Problems typically dealt with include production scheduling, logistics, transportation planning, aircrew scheduling, inventory control, health management, environmental management and financial applications.

Course aims

This course aims to prepare graduates for high-level professional work in the application of management science to the problems of modern society. The subjects in the program provide students with a suite of advanced techniques in such areas as optimisation, mathematical programming and simulation, together with skills for their effective utilisation in the workplace. A broad spectrum of case studies is used to support and strengthen the student's appreciation, understanding and application of operations research to high-level professional work in industries dealing with production, service, health, and all areas of business and finance.

Admission requirements

Applicants for the course must be graduates who have completed studies in operations research or management science corresponding to the Graduate Diploma in Operations Research, or the Operations Research major of the Bachelor of Science in Mathematics, or an equivalent course.

The course has a requirement of two years relevant work experience. Applicants who do not satisfy the academic prerequisites are advised to consider enrolling in the Graduate Diploma in Operations Research or the Graduate Certificate in Mathematical Sciences offered by the Department. All applicants should discuss their eligibility for entry with the Course Director for Postgraduate Programs (Mathematics), and must complete an application form which includes a description of prior work experience.

Attendance

Part-time students should be aware that some attendance at daytime classes may be unavoidable.

Course duration

The course is offered on a full-time basis over two semesters, or on a part-time basis over four semesters.

Course structure

Students are required to complete 48 credit points comprising two core subjects (each 6 credit points), 12 credit points of electives and a substantial project of 24 credit points, Report Part A (12cp) and Report Part B (12cp). Depending on demand, electives may be developed and offered within the Department of Mathematical Sciences in such areas as quantitative business management, neural networks, cybernetics, large-scale optimisation and scheduling, with varying mathematical prerequisites. Electives that are currently offered by the Department of Mathematical Sciences include 35542 Applied Mathematical Programming; 35544 Network Modelling; and 35563 Applied Simulation Modelling. The subjects in the Bachelor of Science (Honours) in Mathematics (see page 113) are also available for this purpose for suitably qualified students. Electives may also be chosen from the Faculty of Business. Applicants who must first undertake the Graduate Diploma in Operations Research may be able to combine elective choices from both courses to form a useful sequence of three or four subjects.

Course program

The program consists of the following subjects:

35545	Further Methods in Operations Research	6cp
35549	Case Studies in Management Science	6cp
35597	Report (MSc) Part A	12cp
35598	Report (MSc) Part B	12cp
3xxxx	Electives	12cp

All postgraduate Mathematics, Statistics and Operations Research core subjects[1]

Subject number	Subject name	Semester offered	Credit points	Prerequisites
33401	Introductory Mathematical Methods	A	6	Nil
35102	Mathematics 2	A,S	6	35101, 35140c
35170	Introduction to Computing	A,S	6	Nil
35212	Linear Algebra	A,S	6	35140
35231	Differential Equations	A,S	6	35102
35232	Advanced Calculus	S	6	35102
35241	Optimisation 1	A,S	6	35102, 35140
35252	Statistics 2	A,S	6	35102, 35151
35281	Numerical Methods	A,S	6	35170, 35231c
35314	Pure Mathematics 3B	S	6	35111
35321	Analysis 1	A,S	6	35102
35322	Analysis 2	S	6	35321, 35212
35340	Operations Research Practice	S	6	35241, 35252
35342	Optimisation 2	A	6	35241
35353	Regression Analysis	A,S	6	35252
35355	Quality Control	S	6	35252
35356	Design and Analysis of Experiments	A	6	35212, 35252
35361	Probability and Stochastic Processes	A,S	6	35252
35363	Simulation Modelling	A,S	6	35170
35382	Numerical Analysis 2	S	6	35281
35384	Financial Modelling	S	6	35102, 35151
35467	Time Series Analysis	A	4	35361
35485	Advanced Financial Modelling	A	4	35340
35545	Further Methods in Operations Research	A	6	35151, 35342
35549	Case Studies in Management Science	S	6	35340, 35342, 35363

A = Autumn semester S = Spring semester c = Corequisite

1 For elective choice, refer to the list of Recommended science strands on page 143.

Assessment

The project is the main component of the subject 35597 and 35598 Report, Parts A and B, extending over two semesters. Studies for the project are normally related to the applicant's prior work experience. An oral presentation in the form of a seminar is also required.

Rules and regulations

Students will have their registration discontinued for failure to complete the course in three years from the time of registration in the case of a full-time student, or in four-and-a-half years in the case of a part-time student (not inclusive of periods of leave of absence) (Rule 3.3.7.1), or for recording any three failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/92/70) (Rule 3.3.7.2).

Other information

All academic inquiries should be made to:

Course Director, Master of Science in Operations Research
Dr Peter Petocz
Department of Mathematical Sciences
telephone (02) 9514 2264
fax (02) 9514 1531
email Peter.Petocz@uts.edu.au

Graduate Certificate in Science Management

- UTS course code: C11150 (pre-2003: N065)
- Testamur title: Graduate Certificate in Science Management
- Abbreviation: none
- Course Director: Professor Tony Baker
- Course fee: $5,112.50 per semester (local)[1]
- Total credit points: 12

Graduate Diploma in Science Management

- UTS course code: C07085 (pre-2003: N066)
- Testamur title: Graduate Diploma in Science Management
- Abbreviation: GradDipScM
- Course Director: Professor Tony Baker
- Course fee: $5,112.50 per semester, full time (local)
  $7,500 per semester (international)
- Total credit points: 24

Master of Science Management

- UTS course code: C04170 (pre-2003: N067)
- Testamur title: Master of Science Management
- Abbreviation: MScM
- Course Director: Professor Tony Baker
- Course fee: $5,112.50 per semester, full time (local)
  $7,500 per semester (international)
- Total credit points: 48

Overview

These programs are specifically designed for science graduates who are making, or expect to make, the transition to management roles in their place of employment. The core subjects provide the student with enhanced understanding of a wide range of topics including experimental design, statistics, time management, and communication skills. Elective subjects may be taken in the Faculty of Science and/or Faculty of Business.

Course aims

Graduates possess theoretical and practical knowledge in science and management and are able to define and solve problems; critically evaluate literature and other information; understand the processes required to establish and maintain collaborative relationships; and understand the relationship between knowledge, research and practice.

Admission requirements

Applicants should have a Bachelor's degree from UTS or other recognised institution, preferably in science. The broad nature of this degree may also attract business graduates that are now working in science-related fields. Applicants that do not hold a Bachelor's degree are permitted to enrol in the Graduate Certificate, with entry to the Graduate Diploma or Master's program contingent on their satisfactory performance in the Graduate Certificate.

Attendance

The science subjects within this program are offered in intensive mode to accommodate the needs of work-based students. Continuing assessment items ensure ongoing interaction with academic staff. Typically, ten days of attendance is required for each 12-credit-point science subject. Normally this would be scheduled for weekend attendance. If there is sufficient demand, some subjects may be delivered offshore.

Course duration

The Graduate Certificate is offered on a one-semester, part-time basis.

The Graduate Diploma is offered on a one-semester, full-time, or two-semester, part-time basis.

The Master's is offered on a two-semester, full-time, or four-semester, part-time basis.

Course structure

The Graduate Certificate program consists of 12 credit points, comprising one compulsory subject. The Graduate Diploma program consists of one compulsory subject, and one subject from a choice of two (total of 24 credit points). The Master's program consists of a total of 48 credit points. One subject is compulsory, then students must choose 24 credit points of science subjects, and 12 credit points of business subjects.

[1] This course is not available to international students.

Course program

Graduate Certificate

60992	Managing Science and Scientists	12cp

Graduate Diploma

60992	Managing Science and Scientists	12cp
	and one of the following	
60990	Research Methodology	12cp
60991	Applied Research Skills	12cp

Master's

60992	Managing Science and Scientists	12cp
60990	Research Methodology	12cp
	or	
60991	Applied Research Skills	12cp
xxxxx	Science electives	12cp
xxxxx	Business Electives	12cp

Science elective options

66014 Hydrogeology
66015 Hydrogeochemistry
66018 Groundwater Geophysics
66025 Contaminated Site Management
66036 Identifying Groundwater Dependent Ecosystems
66037 Ecosystem Vulnerability and Valuation
66038 Policies and Management for Groundwater Dependent Ecosystems
69311 Occupational Health and Safety in Society
69323 Human Factors/Ergonomic Design
69325 Data Analysis in Occupational Health and Safety
69332 Chemical Safety (Management)
69335 People and the Physical Environment
69336 Evaluating Occupational Health and Safety (Construction Industry)
69338 Biological Hazards and Toxicology
69341 Risk Management
69342 Legal Aspects of Occupational Health and Safety
69345 Occupational Health and Safety Management
91499 Current Topics in Science and Technology
69312 Occupational Hazard Analysis

Business elective options

21717 International Management
21718 Organisation Analysis and Design
21720 Employment Relations
21724 Human Resource Management
21725 Organisational Change and Adaptation
21728 Public Sector Management
21741 Operations Management
21742 Quantitative Management
21743 Quality Management Systems
21744 Materials Management
21745 Service Operations Management
21751 Management Research Methods
21784 Global Business Competitive Intelligence
21797 Managing the Supply Chain
21813 Managing People
21838 Product and Process Design
21832 Managing for Sustainability
21833 Strategic Management of the Global Workforce
21835 Human Resource Management Practices
21854 Innovation and Entrepreneurship
21856 Career and Portfolio Development

Assessment

Depending on the subjects chosen, students can expect to experience a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. Continuing assessment items ensure ongoing interaction with academic staff during the non-teaching time. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Articulation and progression

Students transferring from the Graduate Certificate, or Graduate Diploma program are given full credit, subject to successful completion of academic requirements, to the Master's program. There may be cases where students who have successfully completed some of the Master's program wish to transfer to the Doctor of Technology Program (refer to page 179). This transfer is approved when the student has completed the required subjects and is conditional on meeting the academic requirements for admission into the Doctor of Technology. However, completion of the requirements does not guarantee admission into any other program.

Other information

All academic inquiries should be addressed to:

Course Director, Science Management
Professor Tony Baker
telephone (02) 9514 1764
fax (02) 9514 1460
email Tony.Baker@uts.edu.au

Master of Health Science in Traditional Chinese Medicine

- UTS course code: C04172 (pre-2003: NH61)
- Testamur title: Master of Health Science in Traditional Chinese Medicine
- Abbreviation: MHlthSc
- Course Director: Mr W M Cochran
- Course fee: $7,500[1] (local)[2]
- Total credit points: 48

Overview

This course is designed for Chinese herbal medicine practitioners who would like to extend their knowledge of traditional Chinese herbal medicine, and have received advanced professional qualifications in the area. Graduates of this course are qualified to prescribe Chinese herbal medicines. This course takes in students in even years only (next intake 2004), and is offered on a part-time basis only.

Course aims

This course aims to support professional Chinese herbalists in developing specialist skills and knowledge in their area. Graduates are able to competently apply traditional diagnostic and therapeutic techniques, manage and support patient treatments, support the management of a clinical practice, and have a detailed knowledge of herbal prescriptions and pharmacology. Graduates of this course are likely to be employed in private practice as practitioners, or working in the provision of health services in hospitals and clinics.

Admission requirements

Applicants for this program should have an undergraduate degree in Chinese herbal medicine or acupuncture or similar, with at least six months of post-study clinical experience. Applications from practitioners without an undergraduate degree are assessed on an individual basis, with prior learning and professional experiences in Traditional Chinese Medicine recognised for course entry. Applicants should be a member of a registered Chinese herbal medicine or acupuncture association.

[1] Annual part-time fee for students commencing 2004.

[2] This course is not offered to international students.

Attendance

This degree is offered in part-time mode only, and endeavours to support flexible and self-directed learning as much as possible. Students are required to support their formal teaching with clinical practice.

Course duration

This course is offered on a two-year, part-time basis.

Course program

Stage 1

Autumn semester

99599	Principles of Chinese Herbal Medicine	8cp
99632	Graduate Clinic Level 1 (CHM) (2 semesters)	4cp

Spring semester

99612	Principles of Chinese Herbal Prescription	6cp
99613	Principles of Pharmacology in Chinese Medicine	6cp

Stage 2

Autumn semester

99614	Classics of Chinese Herbal Medicine	4cp
99615	Graduate Clinic Level 2 (CHM)	3cp
99594	Chinese Herbal Practice 1	6cp

Spring semester

99596	Chinese Herbal Practice 2	6cp
99597	Graduate Clinic Internship (CHM)	5cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, clinical reports and write-ups, and seminar presentations. Effort has been made to balance formal examinations with reflective/clinically-based assignments such as reflective journals, forum discussions, and clinical assessments. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Rules and regulations

Students are expected to observe the University's Code of Conduct for clinical practice and for the provision of medical services. For further details, see the Faculty Information section of this handbook.

Professional recognition

As at October 2001, there are no professional registration requirements for practitioners of Chinese herbal medicine in NSW, however, formal registration procedures are likely to be regulated in the next few years.

Other information

All academic inquiries should be addressed to:

Course Director,
Traditional Chinese Medicine
Mr Warren Cochran
telephone (02) 9514 7850
fax (02) 9514 7866 or (02) 9281 2267
email Warren.Cochran@uts.edu.au

Master of Occupational Health and Safety Management

- UTS course code: C04174 (pre-2003: P055)
- Testamur title: Master of Occupational Health and Safety Management
- Abbreviation: MOHSM
- Course Director: Associate Professor Peter Logan
- Course fee: $7,200[1] (local)[2]
- Total credit points: 48

Master of Occupational Health and Safety Management (Honours)

- UTS course code: C04175 (pre-2003: P057)
- Testamur title: Master of Occupational Health and Safety Management (Honours)
- Abbreviation: MOHSM(Hons)
- Course Director: Associate Professor Peter Logan
- Course fee: $10,800[1] (local)[2]
- Total credit points: 72

Overview

The objective of these courses is to provide graduate programs in occupational health and safety which produce broadly-based, practical occupational health and safety professionals, with the ability to promote and facilitate a preventive approach to occupational health and safety which minimises occupational injuries and diseases.

The Master of Occupational Health and Safety Management (Honours) course involves all the coursework requirements of the Master of Occupational Health and Safety Management plus a substantial research project in an area of particular interest and/or relevance to the student.

Course aims

These courses aim to enable graduates to:

- influence managers so that occupational health and safety becomes an integral part of day-to-day management

[1] Total fee for students who commenced from 2001.

[2] This course is not offered to international students.

- manage occupational health and safety services within the context of legislative, regulatory and industrial relations environments
- recommend practical and appropriate solutions to occupational health and safety problems
- contribute to improvements in design of plant, processes and equipment, work practices, work organisation and environment, including access for people with disabilities
- be able to establish systems to recognise, evaluate and control hazards, and
- be involved with the rehabilitation of injured workers and the deployment of people with disabilities.

Admission requirements

Students in this course could come from a wide variety of educational backgrounds, including the sciences, medicine, industrial design, architecture, building, business, and law. Applicants should have a degree in their discipline from a recognised university or college of advanced education.

Experienced people, such as occupational health nurses, safety officers and inspectors who do not have a first degree, should also consider applying. Such applicants are required to have at least a Diploma in a relevant area together with sound experience in occupational health and safety in a responsible position. It is most likely that they will be encouraged to enrol in the course as a non-award student, for one semester. Progression as an award student will depend upon first semester results.

Students are permitted to transfer to the Master's Honours program only if they achieve a Credit average or better in the coursework. Persons who already have a Master of Occupational Health and Safety Management degree or equivalent from this or another university are able to enter the Master's Honours program with advanced standing. They would normally be required to complete one semester of appropriate coursework at Credit level or better before undertaking the research project.

Attendance

In general, these courses require attendance at the University's City campus, Broadway, for eight hours per week. Students are expected to satisfactorily complete 12 credit points per semester. The subjects are generally scheduled so that students attend for four hours on two evenings per week.

Course duration

The Master of Occupational Health and Safety Management is offered on a two-year, part-time basis.

The Master of Occupational Health and Safety Management (Honours) can be completed in up to three years of part-time study.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Other information

All academic inquiries should be addressed to:

Course Director, Occupational Health and Safety Management
Associate Professor Peter Logan
telephone (02) 9514 2194
fax (02) 9514 2219
email Peter.Logan@uts.edu.au

Course program

Subject number	Subject name	Credit points	Master's (Hons)	Master's	Semester offered
69312	Occupational Hazard Analysis	6	•	•	A
69325	Data Analysis in Occupational Health and Safety	3	•	•	A
69323	Human Factors/Ergonomic Design	3	•	•	A
69341	Risk Management	6	•	•	S
69345	Occupational Health and Safety Management	6	•	•	A
69336	Evaluating Occupational Health and Safety (Construction Industry)	6	•	•	S
69342	Legal Aspects of Occupational Health and Safety	3	•	•	S
69311	Occupational Health and Safety in Society	3	•	•	S
69338	Biological Hazards and Toxicology	6	•	•	A
69332	Chemical Safety (Management)	3	•	•	S
69335	People and the Physical Environment	3	•	•	S
69351	Occupational Health and Safety Project	12	•		
69353	Research Proposal (Occupational Health and Safety)	12	•		
Total credit points			**72**	**48**	

A = Autumn semester S = Spring semester

Graduate Certificate in Ecology and Groundwater Studies

- UTS course code: C11149 (pre-2003: N062)
- Testamur title: Graduate Certificate in Ecology and Groundwater Studies
- Abbreviation: none
- Course Director: Professor Michael J Knight
- Course fee: HECS (local)
  $6,250 per semester (international)
- Total credit points: 24

Graduate Diploma in Ecology and Groundwater Studies

- UTS course code: C07084 (pre-2003: N063)
- Testamur title: Graduate Diploma in Ecology and Groundwater Studies
- Abbreviation: GradDipEGS
- Course Director: Professor Michael J Knight
- Course fee: HECS (local)
  $6,250 per semester (international)
- Total credit points: 36

Master of Science in Ecology and Groundwater Studies

- UTS course code: C04169 (pre-2003: N064)
- Testamur title: Master of Science in Ecology and Groundwater Studies
- Abbreviation: MSc
- Course director: Professor Michael J Knight
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 48

Overview

Managing natural resource systems for the maintenance of ecosystem health and groundwater resources is a complex problem. An understanding of the dependencies between ecosystems, groundwater and society is critical for sustainable management practices, yet these interactions are poorly understood. To create sustainable allocations and management practices requires a transdisciplinary collaborative approach involving disciplinary fields of ecology and groundwater studies and an appreciation of the socioeconomic, legal and political context in which these decisions are made.

Course aims

The course aims to increase and enhance the knowledge and ability of those people concerned and involved with the management of land, catchments, groundwater resources and ecosystem health. The postgraduate subjects provide a range of methods and knowledge which allow participants to identify groundwater dependent ecosystems, assess their vulnerability and uniqueness, and then develop appropriate management plans.

Admission requirements

Candidates may be admitted to the courses with a four-year Bachelor of Science or Engineering degree from a recognised tertiary institute; a three-year Bachelor of Science or Engineering degree from a recognised tertiary institute, plus two years relevant work experience; or equivalent qualifications. Candidates with a three-year Bachelor of Science or Engineering degree from a recognised tertiary institute without work experience, or without a degree but with suitable work experience, may enrol in the Graduate Certificate and later transfer to a Graduate Diploma or Master's with full credit for completed subjects.

Advanced standing

For further information on advanced standing contact the Course Director.

Attendance

Students may enrol in either on-campus or off-campus (distance) mode. For students who are enrolled in on-campus mode all of the subjects will have face-to-face staff–student contact in a block release option (intensive mode), however the nature and extent of this varies depending on the subject. It may comprise a mixture of tutorial style sessions, field work or lectures. For the off-campus students, one period of attendance in block release format at the campus is required during the program. Teaching which involves field and practical work is done during this period. A characteristic of the courses is the use of web-based delivery and print-based materials which are supplemented by interactive face-to-face sessions when appropriate.

Course program

Subject number	Subject name	Credit points	Graduate Certificate	Graduate Diploma	Master's	Semester offered
66036	Identifying Groundwater Dependent Ecosystems	6	•	•	•	A 2003
66037	Ecosystem Vulnerability and Valuation	6	•	•	•	A 2003
66038	Policy and Management for Groundwater Dependent Ecosystems	6	•	•	•	S 2003
66039	Professional Practice (Environmental)	6	•	•	•	A 2003
66040	Introduction to Research Project	12		•	•	S / A
	or					
66041	Introduction to Research Project	12		•	•	S / A
66042	Research Project (major) or electives	12			•	S / A
	or					
66043	Research Project (major) or electives	12			•	S / A
Total credit points			**24**	**36**	**48**	

Course duration

The Graduate Certificate is offered on a one-semester, full-time basis depending on subject availability.

The Graduate Diploma is offered on a two-semester, full-time or four-semester, part-time basis.

The Master's can be completed on a full-time basis in two academic semesters. Completion on a part-time basis takes four semesters.

Course structure

The Graduate Certificate requires 24 credit points of study.

The Graduate Diploma requires 36 credit points of study.

The Master's requires 48 credit points of study.

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. Communication and assessment may involve written, verbal and electronic modes. For further details on individual subjects, see the Subject Descriptions section or contact the subject's coordinator.

Articulation and progression

Work completed for the Graduate Certificate and Graduate Diploma may be credited towards the Master's, since they all share the same core coursework subjects. However, completion of the requirements for the Graduate Certificate does not guarantee admission to the Graduate Diploma or the Master of Science courses.

Other information

For further information contact:

Professor Michael J Knight
telephone (02) 9514 1984
fax (02) 9514 1985
email Groundwater.Management@uts.edu.au

Graduate Diploma in Hydrogeology and Groundwater Management

- UTS course code: C07083 (pre-2003: N061)
- Testamur title: Graduate Diploma in Hydrogeology and Groundwater Management
- Abbreviation: GradDipHGM
- Course Director: Professor Michael J Knight
- Course fee: HECS (local)
  $6,250 per semester (international)
- Total credit points: 48

Master of Science in Hydrogeology and Groundwater Management

- UTS course code: C04167 (pre-2003: N057)
- Testamur title: Master of Science in Hydrogeology and Groundwater Management
- Abbreviation: MSc
- Course Director: Professor Michael J Knight
- Course fee: HECS (local)
  $7,500 per semester (international)
- Total credit points: 60

Overview

These courses are designed to enable students to develop specialist skills in the area of groundwater management including aspects of geology, hydrology, hydraulics and resource management. This provides a multidisciplinary perspective to issues of groundwater management. These courses are characterised by the requirement to complete a research project

Admission requirements

Graduate Diploma

For entry into the Graduate Diploma, students must hold a UTS degree or equivalent qualification, or they must possess satisfactory practical or industrial experience. Applicants must satisfy Academic Board requirements which ensure their educational preparation and capability for this course and potential articulation to the Master's degree.

Master of Science

For admission to the Master's degree, applicants should hold a four-year science degree from UTS or an equivalent qualification.

Attendance

This course requires block-release attendance of three blocks comprising two weeks each for a series of lectures and laboratory work during Autumn semester, and project work during Spring semester. The courses are also available in distance mode, which has a non-compulsory, on-campus component.

Course duration

The time required to complete the project is approximately 30 weeks. Students may extend their enrolment over more than one year. Students must continue project work until a satisfactory level of achievement has been attained.

Course structure

To be eligible to graduate from these programs, all five core subjects and two electives must be completed. A project must also be completed and students must continue project work until a satisfactory level of achievement has been attained.

Students must complete 48 credit points for the Graduate Diploma, and 60 credit points for the Master's program.

Core subjects

66014	Hydrogeology	6cp
49550	Computing for Groundwater Specialists[1]	0cp
66015	Hydrogeochemistry	6cp
49555	Groundwater Modelling	6cp
49551	Surface Hydrology and Groundwater	6cp

[1] This is a non-credit subject available to Groundwater students only.

Elective subjects

49554	Groundwater Computing	6cp
66018	Groundwater Geophysics	6cp
66025	Contaminated Site Management	6cp
xxxxx	Other approved subject	6cp

Assessment

Depending on the subjects chosen, students can expect to undergo a variety of assessment types before completion of this course including informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the

Course program

Subject number	Subject name	Credit points	Graduate Diploma	Master's	Semester offered
66014	Hydrogeology	6	•	•	A / S[2]
49550	Computing for Groundwater Specialists[1]	0	•	•	A
66015	Hydrogeochemistry	6	•	•	A / S[2]
49555	Groundwater Modelling	6	•	•	A / S[2]
49551	Surface Hydrology and Groundwater	6	•	•	A
xxxxx	Electives (two)	12	•	•	A / S
	and either full-time or part-time program				
66022	Groundwater Science Projects (GD) (FT)	12	•		A[3] / S
66021	Groundwater Science Projects (M) (FT)	24		•	A[3] / S
	or				
66048	Groundwater Science Projects (GD) Part A (PT)	6	•		A[3] / S
	and				
66049	Groundwater Science Projects (GD) Part A (PT)	6	•		A[3] / S
	or				
66046	Groundwater Science Projects (M) Part A (PT)	12		•	A[3] / S
	and				
66047	Groundwater Science Projects (M) Part B (PT)	12		•	A[3] / S
	Total credit points		**48**	**60**	

A = Autumn semester **S** = Spring semester

[1] This is a non-credit subject available to students whose computing background requires strengthening.

[2] Coursework subject offered in Spring semester by distance mode only. Student numbers are strictly limited. Check with subject coordinator for availability.

[3] May be taken in Autumn semester if all coursework subjects have been completed.

Subject Descriptions section, or contact the subject's coordinator.

Articulation and progression

Students may enrol in the Graduate Diploma, and subject to meeting satisfactory academic requirements, may transfer to the Master of Science program. Contact the Course Director for further details.

Other information

All academic inquires should be made to:

Course Director, Hydrogeology and Groundwater Management
Professor Michael Knight
telephone (02) 9514 1984
fax (02) 9514 1985
email Groundwater.Management@uts.edu.au
http://groundwater.ncgm.uts.edu.au/ncgm/

POSTGRADUATE DEGREES BY RESEARCH

The Faculty of Science has a well-developed research culture, and is proud of its history in teaching and researching innovative science. The research courses focus on applied and practical research to bring about benefits to industry and the community. The Faculty has strong links with industry, which supports our research objectives. The courses are highly respected for their relevance, skills and research training, and for their professional focus.

Research profile

The Faculty's new Advanced Research Institutes are:

- Institute for Biotechnology of Infectious Diseases
- Institute for Nanoscale Technology
- Institute for Water and Environmental Resource Management.

The Faculty's Key University Research Strengths are:

- Health Technologies
- Quantitative Finance.

Other Faculty Research Strengths are:

- Forensic Science
- Ecotoxicology.
- Experimental Design and Data Analysis
- Applied Physics including image processing and analysis
- Applied Chemistry
- Mathematics and Statistics
- Computational Number Theory
- Wave Theory
- Scheduling Theory
- Numerical Integration
- Gene Therapy
- Immunology
- Microbiology
- Psycho-oncology
- Marine Studies
- Horticulture
- Medical and Biomedical science
- Neurotoxins
- Traditional Chinese Medicine.

For further information regarding Research Units and Centres in the Faculty, see the Faculty Information section of this handbook.

For further information about research degrees, supervisors and science research activity, contact the Office of the Associate Dean (Research) on (02) 9514 2490.

Research degrees

Application procedures

All applications for research degrees are initially processed by the University Graduate School (UGS). Application forms can be obtained from UGS, the Student Info & Admin Centre or the Faculty Research Office.

All applicants are required to provide satisfactory evidence of their ability to undertake the program in which they are interested, and may be required to take a prescribed course in research methodology or any other course deemed necessary by their principal supervisor or the Faculty Research Degrees Committee. Courses may be intense training type courses (e.g. for a particular instrument or software package) or complete academic subjects from an Honours or a Postgraduate coursework program of this or another University. All postgraduate research students are expected to be proficient in English comprehension and expression. Applicants, whose education was in a language other than English, may be required to take a special test approved by the Academic Board.

Eligibility for admission is not a guarantee that an application will be accepted. Support for the project, availability of supervision, availability of places, and the applicant's overall abilities and experience are all taken into account. Some departments may be unable to accommodate new students until existing ones complete.

Scholarships

As of Autumn 2001, all applicants for research degrees are expected to also apply for a scholarship unless they are expecting to pay full fees. Applications are ranked according to merit by the Faculty's Research Committee, and available scholarships awarded accordingly.

Broadly, there are two types of scholarship:

Scholarships with stipend

A scholarship with stipend provides periodical payments to the student while they are studying, and a waiver of fees, apart from student service fees.

Scholarships offered in this category are:

- Australian Postgraduate Award (APA)
- Australian Postgraduate Award – Industry (APA(I))
- UTS Doctoral Scholarships
- R L Werner Research Scholarships.

Students applying for any of the above scholarships are usually expected to have a Class 1 Honours degree or a Research Master's (by thesis) degree.

Scholarships without stipend

A scholarship without stipend provides no payments to the students and is based on a waiver of course fees. These scholarships are:

- UTS Research Training Scheme Places (RTS places)
- UTS Fee Exemption Scholarships.

Students obtaining an RTS place receive a full waiver of their course fees. The UTS fee-exemption scholarships offer successful applicants a 40 to 100 per cent waiver of their course fees. Students receiving both these types of scholarships are required to pay student service fees. As there is no stipend, students do not receive any payment to help with their study.

Scholarships for international students

International students interested in completing at research degree should contact the UTS International Programs Office to find out about eligibility for International Postgraduate Research Scholarships and AusAid Scholarships.

Infrastructure support for research students

General facilities

The Faculty provides a range of general facilities for all postgraduate research students, as follows:

- Common room
- Study space
- Pigeon hole (for mail)
- Photocopying and printing access
- Telephone
- Email/Internet access.

Computer line access, telephone and email/ Internet facilities are generally expected to be shared.

Specialised equipment

A research project is not accepted by the Faculty unless equipment required to undertake that research is available for access. The Faculty now has a wide array of advanced instruments and processing facilities. Research students commonly require access to one or more of these advanced items and a training course may be necessary. Many of the more heavily used instruments work on a booking system and work often takes place after normal working hours.

Computing assistance

Research students have access to the following facilities:

- information and training on computer systems
- computer facilities
- Internet access training.

Library facilities

All library facilities extended to students are made available to research students in the Faculty while on campus. The Library web page provides details of Library services, facilities and resources available to UTS students:

www.lib.uts.edu.au

Transfer from Master's to Doctoral Programs

Under certain circumstances, a student enrolled in the Master's degree by thesis may apply to transfer to the Doctoral programs. For further information, contact the Associate Dean (Research) or your research supervisor.

Research ethics

UTS supports a range of ethics policies to ensure all research is conducted in an ethical, safe and appropriate manner. A range of committees uphold the University's policies.

Human Research Ethics Committee

It is a requirement at UTS that all research involving humans be conducted in accordance with guidelines established by the Human Research Ethics Committee (HREC). This encompasses all student research, including questionnaires, surveys and physically invasive procedures.

Animal Research Ethics Committee

The Animal Care and Ethics Committee is a joint committee of UTS and the Royal North Shore Hospital. The committee is responsible for ensuring the ethical treatment of animals in research and teaching. For further information contact the UTS Research Office.

Biosafety Committee

The UTS Biosafety Committee looks after biosafety related issues and provides advise to researchers, students and staff involved in research, consultancy and teaching in areas where biosafety issues need to conform to Australian guidelines for activities such as genetic manipulation.

Master of Science (by research)

Science

- UTS course code: C03029 (pre-2003: N053)
- Testamur title: Master of Science
- Abbreviation: MSc
- Course fee: see note (local)
  $7,750 per semester (international)

Mathematics

- UTS course code: C03026 (pre-2003: MM51)
- Testamur title: Master of Science
- Abbreviation: MSc
- Course fee: see note (local)
  $7,750 per semester (international)

Hydrogeology and Groundwater Management

- UTS course code: C03030 (pre-2003: N056)
- Testamur title: Master of Science
- Abbreviation: MSc
- Course fee: see note (local)
  $7,750 per semester (international)

Overview

The Master of Science program provides an opportunity for graduates to acquire research skills and deepen their knowledge in an area of science. Students work under the guidance of a supervisor who is a member of the full-time academic staff of the University.

Course duration

This program normally involves a period of three semesters, full-time, or five semesters, part-time supervised original research.

Course program

Science

91775 MSc Thesis (FT)
91776 MSc Thesis (PT)

Note: Research degrees are offered on a sponsored, scholarship, faculty part-scholarship or full fee-paying basis. Students should contact the Faculty or the University Graduate School for further details. UTS Union and Students' Association fees are payable at enrolment.

Mathematics

34777 MSc Thesis (Mathematics) (FT)
34778 MSc Thesis (Mathematics) (PT)

Hydrogeology and Groundwater Management

60777 MSc Thesis (FT)
60778 MSc Thesis (PT)

Assessment

The degree is examined through presentation of a thesis. In the presentation of the thesis the student is expected to show competence in scientific endeavour by:

- reviewing the previous publications/ work relevant to the research project
- project design and execution
- realistic appraisal of significance of project to area of study
- acceptable standard of presentation, and
- capacity for independent investigation.

The depth and scope of the project is somewhat less than those required for a doctoral award. The aim of the program is the professional development of the candidate, providing experience in problem definition, hypothesis formulation and testing, data acquisition, analysis and interpretation, and project presentation.

Other information

For more information contact:

Office of the Associate Dean (Research)
telephone (02) 9514 2490
fax (02) 9514 1656
email science.research@uts.edu.au

Doctor of Philosophy

Science

- UTS course code: C02031 (pre-2003: N054)
- Testamur title: Doctor of Philosophy
- Abbreviation: PhD
- Course fee: see note (local)
  $7,750 per semester (international)

Mathematics

- UTS course code: C02030 (pre-2003: MM54)
- Testamur title: Doctor of Philosophy
- Abbreviation: PhD
- Course fee: see note (local)
  $7,750 per semester (international)

Hydrogeology and Groundwater Management

- UTS course code: C02032 (pre-2003: N055)
- Testamur title: Doctor of Philosophy
- Abbreviation: PhD
- Course fee: see note (local)
  $7,750 per semester (international)

Overview

The Doctor of Philosophy program provides an opportunity for graduates to acquire high level research skills and substantially deepen their knowledge in an area of science. Students work under the guidance of a supervisor who is a member of the full-time academic staff of the University.

Course duration

This program normally involves a period of six semesters, full-time, or nine semesters, part-time supervised original research.

Course program

Science

60988 PhD Thesis (FT)
60987 PhD Thesis (PT)

Note: Research degrees are offered on a sponsored, scholarship, faculty part-scholarship or full fee-paying basis. Students should contact the Faculty or the University Graduate School for further details. UTS Union and Students' Association fees are payable at enrolment.

Mathematics

34988 PhD Thesis (Mathematics) (FT)
34987 PhD Thesis (Mathematics) (PT)

Hydrogeology and Groundwater Management

60767 PhD Thesis (FT)
607681 PhD Thesis (PT)

Assessment

The degree is examined through presentation of a thesis. The award of this degree signifies that the recipient is capable of conducting independent research at an international standard. In the thesis, the Doctoral graduate must demonstrate all of the qualities required of a Master's degree student, and in addition provide evidence of the following:

- an original significant contribution to knowledge in the field of study
- capacity for critical thought, and
- capacity for independent work.

Other information

For more information contact:

Office of the Associate Dean (Research)
telephone (02) 9514 2490
fax (02) 9514 1656
email science.research@uts.edu.au

Doctor of Philosophy (by publication)

- UTS course code: C02035 (pre-2003: P085)
- Testamur title: Doctor of Philosophy
- Abbreviation: PhD
- Course fee: contact Faculty of Science

Overview

The Doctor of Philosophy (by publication) program enables the degree of PhD to be awarded to candidates on the basis of their original scholarly contribution to knowledge. The purpose of the program is to allow formal recognition of established researchers who have a substantial reputation and standing in their respective fields on the basis of their record of academic publication, and for whom enrolment in the University's existing PhD program would be inappropriate. A decision to award the degree of PhD (by publication) is based on a submission comprising a collection of authored publications and an integrating paper, both of which must be at a standard appropriate for the award of the degree of PhD.

Admission requirements

Applicants need to be established researchers. An applicant who is enrolled concurrently in a PhD program at this or another university is not eligible. For more information, applicants should contact the Faculty or the University Graduate School.

Assessment

The degree is awarded to an applicant who, through published work of which the applicant is either the author or joint author, has made an original scholarly contribution to knowledge and demonstrated a capacity for independent research as judged by independent experts applying appropriate standards at an international level. The standard for the degree is the same as that required generally for the PhD at UTS.

The thesis to be submitted consists of published works and an extended paper integrating the work. The paper is usually between 5,000 and 10,000 words and sets out ways the publications as a whole represent an original and significant contribution to knowledge. In some cases, it may be necessary for the candidate to undertake additional research work to provide a basis for presenting the material as an integrated whole.

Examination of the thesis is carried out in the same way as for other doctoral degrees, that is with three examiners, at least two of whom are external to the University.

Other information

For more information contact:

Office of the Associate Dean (Research)
telephone (02)9514 2490
fax (02) 9514 1656
email science.research@uts.edu.au

Doctor of Technology in Science

- UTS course code: C02033 (pre-2003: N058)
- Testamur title: Doctor of Technology in Science
- Abbreviation: DTech
- Course Director: Professor Anthony Baker
- Course fee: $5,112.50 per semester – coursework (local), $8,625 per semester – research (local)
  $7,750 per semester (international)

Master of Technology in Science

- UTS course code: C04168 (pre-2003: N059)
- Testamur title: Master of Technology in Science
- Abbreviation: MTech
- Course Director: Professor Anthony Baker
- Course fee: $5,000 per semester – coursework (local), $7,500 per semester – research (local)
  $7,750 per semester (international)

Overview

The Doctor of Technology is a professionally orientated higher research degree, developed to meet the needs of scientists working in industry who would like to upgrade their management and research qualifications without completing a traditional PhD. This program enables students to undertake research programs that their employers and industry believe to be relevant. Students may choose to exit the program at the completion of the coursework component of the degree, and will be awarded the Master of Technology. All students must initially enrol in the Doctor of Technology.

Course aims

The Doctor of Technology aims to produce graduates that: have extended their knowledge and that of their industry in a particular scientific area; have advanced professional practice in a field, including the development of practical solutions in the workplace; and are capable of enhancing their professional role in their workplace and industry.

The Doctor of Technology is aimed at students who are concerned with addressing practical problems and advancing knowledge, not necessarily at the cutting edge of research, but in finding innovative solutions from the existing body of basic knowledge in applied science.

Admission requirements

To be eligible for admission into this program, students should have completed a recognised Bachelor's degree with Honours. Students that do not have Honours may be eligible for admission with a Bachelor's degree and relevant work experience.

Attendance

The coursework component of this degree is taught in block mode, with intensive periods of contact time. Students are then expected to continue learning independently. The research component of this degree may be completed in the workplace, or overseas as may be necessary. Subject to demand, this course may be taught in block mode overseas.

Course duration

The Doctor of Technology is offered on a three-year, full-time basis (this consists of one year for the coursework component and two years for the research component). It is possible to complete this degree in part-time mode. Students should consult the Course Director.

The Master of Technology is offered on a one-year, full-time basis.

Course structure

The Doctor of Technology is divided into two major components:

- coursework consisting of four subjects taught in block mode over one year, and
- research (on campus or in the workplace) which should normally be completed within two years.

The research component of the degree should address a practical problem raised by industry or a community group. The project is formulated during the second semester of candidature in partnership with candidate, potential supervisors and the industry/ community group (see 60993 Research Project Proposal in the Subject Descriptions section).

Assessment

Students undergo a variety of assessment types before completion of this course including formal and informal examinations, assignments and essays, practical reports and write-ups, and seminar presentations. Assessment tasks may be based on individual or group work. For further details on individual subjects, see the Subject Descriptions section, or contact the subject's coordinator.

Assessment of the research component is substantially external, as is the case for PhD, with at least two of the three examiners being external to the university. The research work should: demonstrate an ability to critically evaluate current research; advance the level of professional practice; make a distinctive contribution to the profession or discipline; be scholarly and original; and reflect the application of intellectual skills to a practical problem in science and technology. Assessment includes a public presentation of the research work to an appropriate industry or professional group.

Candidates and supervisors for this program are required to provide a progress report each semester in the same manner as PhD program.

Professional recognition

This degree meets the definitions of a research degree within the Australian Higher Education framework.

Other information

All academic inquiries should be addressed to:

Course Director, Doctor of Technology
Professor Anthony Baker
telephone (02) 9514 1764
email Anthony.Baker@uts.edu.au

Further information regarding research degrees should be addressed to:

Administrative Officer, Research
Office of the Associate Dean, Research
Faculty of Science
telephone (02) 9514 2490
email science.research@uts.edu.au

Course program

			Master of Technology	Doctor of Technology
60990	Research Methodology	12	•	•
60991	Applied Research Skills	12	•	•
60992	Managing Science and Scientists	12	•	•
60993	Research Project Proposal	12	•	•
	Research Project	96		•
Total credit points			**48**	**144**

SUBJECT DESCRIPTIONS

SUBJECTS OFFERED BY SCIENCE

33101

Mathematics 1 (Life Sciences)

3cp; 3hpw
Semester offered: Spring
Offered at: City, St Leonards campuses

Topics covered in this subject include: aspects of measurement; sequences and series; convergence and limits; graphical representation of functions; sigmoid curve; differentiation; integration; elementary differential equations; and periodic functions. All topics are illustrated by problems relevant to biology.

33106

Statistical Design and Analysis

This full-year subject has been replaced by 33112 Statistical Design and Analysis – Part A and 33113 Statistical Design and Analysis – Part B.

33112

Statistical Design and Analysis – Part A

3cp; two semesters; 3hpw
Semester offered: Autumn
Offered at: City, St Leonards campuses

Topics covered in this subject include descriptive statistics, measures of location and dispersion, discrete and continuous distributions commonly used to model observational and experimental results, simple random sampling, introduction to inference and estimation, tests for normality, tests for population means and variances, and tests for categorical data.

Note: The subjects 33112 and 33113 replace the full-year subject 33106 Statistical Design and Analysis.

33113

Statistical Design and Analysis – Part B

3cp; two semesters; 3hpw; prerequisite(s): 33112 Statistical Design and Analysis – Part A
Semester offered: Spring
Offered at: City, St Leonards campuses

Topics covered in this subject include the design and analysis of experiments in the natural sciences; statistical tests; both parametric and distribution free tests for a variety of designs including paired trials; completely randomised design; block designs; and designs with interaction terms or covariates. Regression analysis is also presented and includes linear, multiple, polynomial and logistic regression together with appropriate diagnostic techniques to determine the validity of the regression models.

Note: The subjects 33112 and 33113 replace the full-year subject 33106 Statistical Design and Analysis

33116

Statistical Design and Analysis

6cp; 6hpw
Semester offered: Autumn
Offered at: City, St Leonards campuses

This subject provides the theory and techniques needed in the design and analysis of experiments in the natural sciences. It covers descriptive statistics, measures of location and dispersion, commonly used discrete and continuous distributions and simple random sampling. Statistical tests, both parametric and distribution free, are presented for a variety of designs, including paired trials, completely randomised design, block designs and designs with interaction terms or covariates. The analysis of linear, multiple and polynomial regression models is also presented, together with appropriate diagnostic techniques to determine the validity of the models.

33130

Mathematical Modelling 1

6cp; prerequisite(s): no formal prerequisites, but a knowledge of 3 units of HSC Mathematics is assumed; corequisite(s): 68037 Physical Modelling
Semester offered: Autumn, Spring
Offered at: City campus

On completion of this subject students should be able to: understand the relevance of mathematics to engineering science and practice; understand the way in which mathematics can supply useful tools and resources to model real world problems; use Mathematical terminology and concepts; use formal and informal language to demonstrate understanding of these concepts; demonstrate a high level of skill in the computational techniques of the subject; demonstrate understanding of the theoretical results which justify the use of these techniques; communicate the above knowledge clearly, logically and critically; use the computer algebra system *Mathematica* to perform calculations and explore mathematical ideas relevant to the subject content; be able to apply the subject matter covered in lectures, tutorials and assignments to previously unseen problems; and be aware of the historical context of mathematical development. Topics include: presentation of a collection of physical problems; functions and their relationship to measurement and the interpretation of physical results; differentiability; differential equations arising from physical problems; solution by series; growth and decay problems; oscillatory motion; trigonometric functions and inverse trigonometric functions; integration; the logarithm function; inverse functions; methods of integration; and introduction to nonlinear oscillations. The computer algebra system *Mathematica* is used throughout the subject as an aid to computation, graph plotting and visualisation.

33132

Mathematical Modelling 1 (two-semester)

This two-semester subject has been replaced by 33133 Mathematical Modelling – Part A and 33134 Mathematical Modelling – Part B.

33133

Mathematical Modelling 1 – Part A[1]

6cp; prerequisite(s): no formal prerequisites, but a knowledge of 3-unit Mathematics is assumed; corequisites(s): 68039 Physical Modelling
Semester offered: Autumn
Offered at: City campus

On completion of subjects 33133 and 33134 students should be able to: understand the relevance of mathematics to engineering science and practice; understand the way in which mathematics can supply useful tools and resources to model real world problems; use mathematical terminology and concepts; use formal and informal language to demonstrate understanding of these concepts; demonstrate a high level of skill in the computational techniques of the subject; demonstrate understanding of the theoretical results which justify the use of these techniques; communicate the above knowledge clearly, logically and critically; use the computer algebra system *Mathematica* to perform calculations and explore mathematical ideas relevant to the subject content; be able to apply the subject matter covered in lectures, tutorials and assignments to previously unseen problems; and be aware of the historical context of mathematical development. Topics include: presentation of a collection of physical problems; functions and their relationship to measurement and the interpretation of physical results; differentiability; differential equations arising from physical problems; solution by series; growth and decay problems; and oscillatory motion.

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[1] The subjects 33133 and 33134 replace the full-year subject 33132 Mathematical Modelling 1.

33134

Mathematical Modelling 1 – Part B[1]

6cp; prerequisite(s): no formal prerequisites, but a knowledge of 3-unit Mathematics is assumed; corequisites(s): 68039 Physical Modelling and 33133 Mathematical Modelling 1 – Part A
Semester offered: Autumn
Offered at: City campus

On completion of subjects 33133 and 33134 students should be able to: understand the relevance of mathematics to engineering science and practice; understand the way in which mathematics can supply useful tools and resources to model real world problems; use mathematical terminology and concepts; use formal and informal language to demonstrate understanding of these concepts;

demonstrate a high level of skill in the computational techniques of the subject; demonstrate understanding of the theoretical results which justify the use of these techniques; communicate the above knowledge clearly, logically and critically; use the computer algebra system *Mathematica* to perform calculations and explore mathematical ideas relevant to the subject content; be able to apply the subject matter covered in lectures, tutorials and assignments to previously unseen problems; be aware of the historical context of mathematical development. Topics covered include the following: trigonometric functions and inverse trigonometric functions; integration; the logarithm function; inverse functions; methods of integration; and introduction to nonlinear oscillations. The computer algebra system *Mathematica* is used throughout the subject as an aid to computation, graph plotting and visualisation.

[1] The subjects 33133 and 33134 replace the full year subject 33132 Mathematical Modelling 1.

33190

Mathematical Modelling for Science

6cp; 6hpw; prerequisite(s): no formal prerequisite but a knowledge of 2 units of HSC Mathematics is assumed
Semester offered: Autumn, Spring
Offered at: City campus

Topics covered in this subject include: functions and their relationship to scientific experiments; differentiability; differential equations arising from scientific problems; solution by series; radioactive decay and exponential functions; oscillatory motion and trigonometric functions; integration; the logarithm function; inverse functions; inverse trigonometric functions; and solution of differential equations by integration and inverse functions. The computer algebra system *Mathematica* is used for symbolic, graphical and numerical computations.

33230

Mathematical Modelling 2

6cp; prerequisite(s): 33130 Mathematical Modelling 1 or 33132 Mathematical Modelling 1 (two-semester model) or 33134 Mathematical Modelling – Part B
Semester offered: Autumn, Spring, Summer
Offered at: City campus

On completion of this subject students should be able to: understand the relevance of mathematics to engineering science and practice; understand the way in which mathematics can supply useful tools and resources to model real world problems; use mathematical terminology and concepts; use formal and informal language to demonstrate understanding of these concepts; demonstrate a high level of skill in the computational techniques covered in the subject content; demonstrate understanding of the theoretical results which justify the use of these techniques; communicate the above knowledge clearly, logically and critically; use the computer algebra system *Mathematica* to perform calculations and explore mathematical ideas relevant to the subject content; apply the subject matter covered in lectures, tutorials and assignments to previously unseen problems and proofs; be aware of the historical context of mathematical development.

Topics include the following: linear algebra; solutions to sets of equations resulting from particular problems; the need to develop a variety of ways of solving sets of equations; matrices and determinants, eigenvectors and eigen-values; a standard treatment of vectors building on that given in Physical Modelling; partial derivatives using waves and temperature distributions as illustrative examples; optimisation; the method of least squares; multiple integrals and their applications; probability with a focus on the determination of the reliability of a system of components in various engineering contexts; variance, skewness and kurtosis; probability distributions, conditional probability and bivariate probability.

The computer algebra system *Mathematica* is used throughout the subject as an aid to computation, graph plotting and visualisation.

33290

Computing and Mathematics for Science

6cp; 6hpw; prerequisite(s): 33190 Mathematical Modelling for Science
Semester offered: Spring, Summer
Offered at: City campus

In the computing component of this subject students study a range of computing modules designed to give them basic computing application skills and some more advanced modules appropriate to their particular discipline. The mathematics component includes studies of simultaneous linear equations and their occurrence in scientific problems; methods for solving these equations using matrices and determinants; eigenvalues and eigenvectors; vectors in two and three dimensions; products of vectors; spatial geometry and coordinate systems; functions of several variables; partial derivatives; optimisation; and method of least squares. The computer algebra system *Mathematica* is used for symbolic, graphical and numerical computations.

33390

Mathematics and Scientific Software

6cp; 4hpw; prerequisite(s): 33290 Computing and Mathematics for Science
Semester offered: Autumn
Offered at: City campus

Topics covered in this subject include: methods of integration; double and triple integrals and their application to scientific problems; the use of spherical and cylindrical coordinates; linear algebra and its relationship to boundary value problems; inner products and orthogonality; separation of variables; and fourier series. An introduction to C and *Mathematica* programming in the context of problems from this subject and its prerequisite is also covered.

33401

Introductory Mathematical Methods[1]

6cp; 3hpw
Semester offered: subject to demand
Offered at: City campus

Topics covered include: matrices and determinants; gaussian reduction; solution of linear equations; eigenvalues and eigenvectors; vectors; products of vectors; equations of lines and planes; complex numbers; polar form and de Moivre's theorem; linear independence of vectors; rank of a matrix; symmetric matrices; quadratic forms; differentiation and integration of functions of one variable; functions of several variables; partial derivatives; maxima and minima; Taylor's theorem; gradient and Hessian; and classification of critical points.

[1] Not offered in 2003.

33490

Computational Mathematics and Physics[1]

6cp; 5hpw; prerequisite(s): 68201 Physics in Action (Physics 2); 33390 Mathematics and Scientific Software
Semester offered: subject to demand
Offered at: City campus

The subject is an introduction to the study of complex physical systems by computer and an introduction to computational tools used in areas such as molecular spectroscopy, fluid flows, diffusion of pollutants, scanning tunnelling microscopy, wave propagation along optic fibres.

Topics covered include: one dimensional heat and wave equations; solution by separation of variables; Fourier sine and cosine series; line and surface integrals divergence and curl; theorems of Gauss and Stokes; functions of a complex variable; Cauchy-Riemann equations; complex integration; Cauchy's integral theorem and integral formula; Taylor and Laurent series; and singular points and their use in contour integration.

[1] Not offered in 2003.

33xxx

Mathematics for Physical Science

6cp; 5hpw; prerequisite(s): 33290 Computing and Mathematics for Science or 33401 Introductory Mathematical Methods or 35102 Mathematics 2 or equivalent
Semester offered: Autumn
Offered at: City campus

Topics covered in this subject include: methods of integration; double and triple integrals and their application to scientific problems; spherical and cylinotical coordinates; boundary value problems; separation of variables; fourier series; and vector calculus.

34777

MSc Thesis (Mathematics) (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 176.

34778

MSc Thesis (Mathematics) (PT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 176.

34987

PhD Thesis (Mathematics) (PT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 177.

34988

PhD Thesis (Mathematics) (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 177.

35010

Foundation Mathematics

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

This subject aims to increase a student's chance of success at university by developing essential mathematical knowledge. It establishes essential knowledge and skills in the areas of algebra, functions, calculus and probability. Students are required to actively participate in their learning by oral presentations, group activities and individual work. Students use the computer algebra system *Mathematica* in applied problems.

35100

Mathematical Practice

6cp; 4hpw
Semester offered: Autumn
Offered at: City campus

This subject covers: an overview of mathematics and its applications in historical and current contexts; an introduction to reading, writing and speaking mathematics; perspectives on communication and mathematical communication; inductive and deductive reasoning and proof techniques; problem solving and modelling; scientific method; and mathematical practice case studies.

35101

Mathematics 1

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

This subject covers the following topics: limits, continuity and differentiation for functions of a single variable; mean value theorem; curve sketching; related rates and maxima and minima; integration; Riemann sums; the fundamental theorem of calculus; applications to areas, volumes and lengths of curves; logarithm and exponential functions; trigonometric and hyperbolic functions; inverse trigonometric and hyperbolic functions; L'Hôpital's rule; methods of integration; and improper integrals.

35102

Mathematics 2

6cp; 6hpw; prerequisite(s): 35101 Mathematics 1; corequisite(s): 35140 Operations Research Modelling
Semester offered: Autumn, Spring, Summer
Offered at: City campus

This subject covers the following topics: complex numbers; first order variable separate and linear ordinary differential equations; higher order linear differential equations with constant coefficients; oscillation problems; sequences and series; power series and radius of convergence; Taylor and Maclaurin series; solution of homogeneous linear differential equations about an ordinary point; vectors; products of vectors; equations of lines and planes; functions of several variables; partial derivatives and gradient; and double integrals.

35106

Mathematics in Sport

6cp; 3hpw
Semester offered: subject to demand
Offered at: City campus

The subject covers a selection of major topics such as: the assignment problem and its use for team selection, graphical statistics for performance prediction, graph theory and tournament construction, ranking methods, the mathematics of balls in flight and instances of the use of mathematics in (alphabetically) athletics, basketball, blackjack, cricket, darts, football, snooker, tennis, among others.

35111

Discrete Mathematics

6cp; 4hpw
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: logical connectives, truth tables, tautologies; propositional and predicate logic; proof techniques, induction, analysis of algorithms; set operations, countability, pigeonhole principle; counting, permutations and combinations; linear difference equations; relations, equivalence relations, partitions, partially ordered sets; functions, bijections, inverse functions; equivalent sets, cardinality; graph terminology, matrix representation of graphs; Euler and Hamiltonian cycles; spanning trees; colouring problems; Boolean algebra; switching circuits; Karnaugh maps; finite-state automata; and turing machines.

35140

Operations Research Modelling

6cp; 4hpw
Semester offered: Autumn, Spring
Offered at: City campus

This subject is an introduction to operations research methodology. A variety of problems from manufacturing, construction, transportation and finance are considered, together with approaches to the formulation of the corresponding mathematical models. Solutions for the models are obtained using decision support software with particular emphasis on spreadsheets and their uses in business applications. The art of model building is discussed in conjunction with an introductory description of several important solution methods and notions of matrices, determinants and vectors.

35151

Statistics 1

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

Topics covered include: describing and exploring data; producing data; probability; random variables; introduction to inference; inference for distributions; inference for categorical data; regression; analysis of variance; and distribution-free inference.

35170

Introduction to Computing

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: an introduction to computer systems; the use of editors, interfaces and operating systems; an introduction to the C language and its application to the implementation of numerical algorithms. Examples used include numerical solutions of linear and nonlinear equations and the numerical calculation of integrals.

35205

History of Mathematics

6cp; 4hpw
Semester offered: subject to demand
Offered at: City campus

This subject covers the following topics: overview of general history; overview of the history of mathematics; mathematics before the Greeks; Greek mathematics and the development of logical argument and rigour; the decline of Greek mathematics; Indian and Arabic contributions to notation and calculation, and the preservation of Greek knowledge; scholastic and Renaissance mathematics: the rediscovery of classical knowledge in western Europe; the scientific revolution and the discovery of the calculus; development of the calculus and its applications in continental Europe; the search for a rigorous foundation for the calculus and the rise of analysis; and the resurgence of geometry and algebra in the 19th century.

35212

Linear Algebra

6cp; 4hpw; prerequisite(s): 35140 Operations Research Modelling
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: systems of linear equations, decompositions; vector spaces; inner product spaces; Gram-Schmidt orthogonalisation; the eigen-value problem; symmetric matrices, diagonalisation, quadratic forms; Jordan form; and matrix exponentials.

35231

Differential Equations

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2; corequisite(s): 35212 Linear Algebra
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: existence and uniqueness of solutions; variation of parameters; qualitative theory of linear and nonlinear systems; limit cycles; Poincaré-Bendixson theorem; applications; boundary value problems, separation of variables; Fourier series; heat and wave equations; Laplace's equation; and transform methods.

35232

Advanced Calculus

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2
Semester offered: Spring
Offered at: City campus

This subject covers the following topics: vector fields; divergence and curl; line and surface integrals; integral theorems; functions of a complex variable; analytic functions; Cauchy-Riemann equations; complex integrals; Cauchy's theorem; residues and poles; and contour integration.

35241

Optimisation 1

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2, 35140 Operations Research Modelling
Semester offered: Autumn, Spring
Offered at: City campus

Topics covered include: fundamental ideas of optimisation; the two-phase simplex method and the revised simplex method; duality theory; the dual simplex method and the cutting plane method; sensitivity analysis; and first- and second-order optimality conditions for nonlinear programming.

35252

Statistics 2

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2, 35151 Statistics 1
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: probability; random variables and their probability distributions; multivariate probability distributions; functions of random variables; sampling distributions and the Central Limit Theorem; applications to estimation; and multivariate normal distribution.

35254

Health Statistics

6cp; 4hpw; prerequisite(s): 35151 Statistics 1
Semester offered: Spring
Offered at: City campus

This subject covers the following topics: the place of statistical inference in the health sciences; planning of statistical investigations; further experimental designs including nested designs and crossover designs; multiple regression models; time series and repeated measurements; categorical data analysis; survival analysis; statistical methods in epidemiology; biological assay; and ethical issues in health statistics.

35281

Numerical Methods[1]

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2, 35151 Statistics 1, and either 35170 Introduction to Computing or 31465 Object-oriented Programming
Semester offered: Autumn, Spring
Offered at: City campus

This subject is an introduction to numerical analysis, including the study of: solution methods for nonlinear equations, systems of linear equations (LU factorisation and iterative methods), interpolation, numerical differentiation and integration, orthogonal polynomials and approximation theory, the Euler and Runge-Kutta methods for initial value problems, and finite difference methods for boundary value problems. Further work on the use of spreadsheet modelling, including coverage of command macros is also dealt with.

[1] This subject was formerly called Numerical Analysis 1.

35292

Project A

2cp; prerequisite(s): by consent; corequisite: by arrangement
Semester offered: Autumn, Spring
Offered at: City campus

This subject involves a supervised investigation of a topic in an area of interest, providing the student with additional skills of direct use in employment or in further academic studies.

35293

Project B

3cp; prerequisite(s): by consent; corequisite: by arrangement
Semester offered: Autumn, Spring
Offered at: City campus

This subject involves a supervised investigation of a topic in an area of interest, providing the student with additional skills of direct use in employment or in further academic studies.

35294

Project C

4cp; prerequisite(s): by consent; corequisite: by arrangement
Semester offered: Autumn, Spring
Offered at: City campus

This subject involves a supervised investigation of a topic in an area of interest, providing the student with additional skills of direct use in employment or in further academic studies.

35295

Project D

5cp; prerequisite(s): by consent; corequisite: by arrangement
Semester offered: Autumn, Spring
Offered at: City campus

This subject involves a supervised investigation of a topic in an area of interest, providing the student with additional skills of direct use in employment or in further academic studies.

35296

Project E

6cp; prerequisite(s): by consent; corequisite: by arrangement
Semester offered: Autumn, Spring
Offered at: City campus

This subject involves a supervised investigation of a topic in an area of interest, providing the student with additional skills of direct use in employment or in further academic studies.

35313

Pure Mathematics 3A

6cp; 4hpw; prerequisite(s): 35231 Differential Equations, 35232 Advanced Calculus
Semester offered: subject to demand
Offered at: City campus

Topics covered include: projective geometry: Euclidean and non-Euclidean geometry, Pappus' and Desargues' theorems, transformations in the plane, collineations, projectivities, incidence matrices, Latin squares; and differential geometry: vector fields, vector fields on surfaces, Gauss map, Weingarten map, curvature of curves and surfaces.

35314

Pure Mathematics 3B

6cp; 4hpw; prerequisite(s): 35111 Discrete Mathematics
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: number theory: the division algorithm and unique factorisation in Z, number-theoretic functions, congruences, Fermat's theorem, Euler's theorem, linear diophantine equations, continued fractions; groups: basic definitions, symmetry groups, cyclic groups, generators, relations and presentations of a group, subgroups and cosets, conjugacy and normal subgroups, quotient groups, solvable groups, prime power groups, Sylow theorems; group homomorphisms and isomorphism theorems; and introduction to rings: homomorphisms, subrings, ideals, quotient rings.

35321

Analysis 1

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2
Semester offered: Autumn, Spring
Offered at: City campus

This subject covers the topics: algebraic and order properties of R; countable and uncountable sets; least upper bound axiom; sequences and their convergence; continuous and uniformly continuous functions; properties of continuous functions on a closed interval; differentiability; series and their convergence; tests for convergence; upper and lower sums; the Riemann integral; sequences and series of functions; uniform convergence; properties of uniformly convergent series; and Weierstrass M-test.

35322

Analysis 2

6cp; 4hpw; prerequisite(s): 35321 Analysis 1, 35212 Linear Algebra
Semester offered: Spring
Offered at: City campus

Topics covered include: metric and normed spaces, Banoch spaces; compact subsets of R, the Heine-Borel theorem; topological spaces: Hausdorff spaces, homeomorphisms; operators and functionals on normed spaces, the dual space; inner product spaces; Hilbert space; Hilbert space isomorphism; measures and outer measures; lebesgue and Lebesgue-Stieltjes measure; borel sets; the Cantor set; measurable functions, step functions; the Lebesgue integral; Lp spaces: Hölder and Minkowski inequalities, completeness; product measures; probability spaces: random variables, distribution functions, independence, expectation and variance; modes of convergence: Borel-Cantelli lemmas, laws of large numbers; the Radon-Nikodym theorem; and conditional expectation and conditional probability.

35333

Applied Mathematics 3A

6cp; 4hpw; prerequisite(s): 35232 Advanced Calculus; corequisite(s): 35335 Mathematical Methods
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: modelling mechanical properties: force, work, energy, power, projectiles, oscillation, orbits; and modelling electromagnetic properties: electric fields, magnetic fields, Coulomb's law, Biot-Savart law, Ampere's circuital law, Faraday's law, Maxwell's equations.

35334

Applied Mathematics 3B

6cp; 4hpw; prerequisite(s): 35333 Applied Mathematics 3A, 35335 Mathematical Methods
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: acoustic waves in fluids; waves on a liquid surface; elastic waves in solids; and electromagnetic waves.

35335

Mathematical Methods

6cp; 4hpw; prerequisite(s): 35231 Differential Equations
Semester offered: subject to demand
Offered at: City campus

Topics covered include: vector integral theorems; Bessel and Legendre equations; applications to boundary value problems; and integral transform methods for solving boundary value problems.

35340

Operations Research Practice

6cp; 4hpw; prerequisite(s): 35241 Optimisation 1, 35252 Statistics 2
Semester offered: Spring
Offered at: City campus

Topics in this subject include: financial modelling: mathematics of finance, compound interest, various types of annuities, perpetuities, bond pricing, contingent payments, consumption and investment decisions under certainty, investment decisions under uncertainty, utility theory and risk analysis, Markowitz portfolio theory, single index model, capital asset pricing model; and inventory control: economic order quantity, production lot size model, quantity discounts, shortage models, single period model, safety stock approach, service level approach, periodic review system, dynamic EOQ, classical optimisation methods, materials requirements planning.

35342

Optimisation 2

6cp; 4hpw; prerequisite(s): 35241 Optimisation 1
Semester offered: Autumn
Offered at: City campus

This subject covers the following topics: branch-and-bound methods and column generation for integer programming; parametric linear programming; numerical methods for unconstrained nonlinear optimisation; Newton's method; conjugate direction method; numerical methods for constrained nonlinear optimisation, feasible direction methods, penalty and barrier methods; and introduction to stochastic programming.

35344

Network Optimisation

6cp; 4hpw; prerequisite(s): 35241 Optimisation 1
Semester offered: subject to demand
Offered at: City campus

Topics covered include: transportation problems; the transportation simplex method; assignment problems; trans-shipment problems; shortest path problems; maximum flow problems; project planning and scheduling; CPM cost models; network simulation models; minimum-cost network flow problems; network simplex method; out-of-kilter algorithms; algorithm analysis; auction algorithm; and solution of problems using commercially available software.

35353

Regression Analysis

6cp; 4hpw; prerequisite(s): 35252 Statistics 2
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: simple and multiple linear regression; general linear models; weighted regression; diagnostics and model building; analysis of covariance; regression graphics; and introduction to nonlinear regression.

35355

Quality Control

6cp; 4hpw; prerequisite(s): 35252 Statistics 2
Semester offered: Spring
Offered at: City campus

This subject covers the following topics: total quality management; process control for attributes and variables, introducing Shewhart, Cusum, and EWMA control charts and covering regular, short, multiple-stream and serially correlated processes; acceptance sampling for attributes and variables; process capability analysis, including nonconforming ppm, capability ratios and Taguchi quality loss; tolerance analysis covering linear and nonlinear combinations of components, and Taguchi's method; and reliability analysis, including reliability measures, bounds and estimation for individual components and systems, and spare parts provisioning.

35356

Design and Analysis of Experiments

6cp; 4hpw; prerequisite(s): 35212 Linear Algebra, 35252 Statistics 2
Semester offered: Autumn
Offered at: City campus

Topics covered include: introduction to general concepts of the design of experiments; completely randomised, randomised complete block and Latin square designs; multiple comparisons; factorial designs; and introduction to Taguchi designs and response surface designs.

35361

Probability and Stochastic Processes

6cp; 4hpw; prerequisite(s): 35252 Statistics 2
Semester offered: Autumn, Spring
Offered at: City campus

Topics in this subject include: probability; random variables and expectations; limit theorems; Markov chains; the Poisson process; and birth and death processes.

35363

Simulation Modelling

6cp; 4hpw; prerequisite(s): 35170 Introduction to Computing
Semester offered: Autumn
Offered at: City campus

General principles of Monte Carlo and discrete event simulation. Simulation software and languages. Poisson process, birth-and-death models, queuing models with one and several servers. Pseudorandom number generation and the corresponding statistical tests, evaluation of integrals using random numbers. Generation of continuous and discrete random variables, inverse transform technique, convolution method, acceptance–rejection technique. Verification and validation of simulation models. Output analysis for a single simulation model, analysis of terminating simulations, analysis of steady-state performance. Comparison and evaluation of alternative system designs. Variance reduction techniques.

35364

Statistics for Quantitative Finance

6cp; 6hpw
Semester offered: Autumn
Offered at: City campus

This subject provides a foundation in probability and statistics, introduces the basic concepts of stochastic processes and time series. Topics include: random variables, expectations, law of large numbers, central limit theorem, estimation of parameters, testing hypothesis, linear regression, Gaussian and Markov stochastic processes, basic time series analysis.

35382

Numerical Analysis 2

6cp; 4hpw; prerequisite(s): 35281 Numerical Methods
Semester offered: Autumn
Offered at: City campus

Topics covered include: numerical linear algebra: the algebraic eigen-value problem, the singular value decomposition and least squares methods; extrapolation and multistep methods for initial value problems, stiff problems; boundary value problems: variational and finite element methods; and symbolic computation: programming styles in *Mathematica* (imperative, functional and rule-based), the evaluation engine, use of pattern matching, implementation of standard symbolic and numerical packages.

35383

High Performance Computing

6cp; 4hpw; prerequisite(s): 35281 Numerical Methods
Semester offered: subject to demand
Offered at: City campus

This subject examines some of the main aspects of high performance computing, particularly as applied to problems arising in scientific and technological applications. The solution of such problems is often computationally intensive, and the use of parallel computer systems and programs in their solution can provide substantial benefits. Topics include: the modern Fortran 95 programming language, the use of MPI (in distributed memory environments) and OpenMP (in shared memory environments) to implement parallel programs.

35384

Financial Modelling

6cp; 3hpw; prerequisite(s): 35102 Mathematics 2, 35151 Statistics 1
Semester offered: Spring
Offered at: City campus

Topics in this subject include: an introduction to models of the standard problems of financial management and the mathematical techniques for their solutions: asset and liability management, planning day-to-day operations and the firm's financing and investment decisions; net-present value; capital budgeting problems; investment under certainty; investment decisions under uncertainty; the debt capacity decision; debt maturity and timing decisions; dividend policy; and internal financing and growth.

35391

Seminar (Mathematics)

6cp; 4hpw; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

The subject involves group studies in mathematics. The topics vary from year to year and are chosen in accordance with the interests of students and staff, and the availability of staff.

35392

Seminar (Operations Research)

6cp; 4hpw; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

The subject involves group studies in operations research. The topics vary from year to year and are chosen in accordance with the interests of students and staff, and the availability of staff.

35393

Seminar (Statistics)

6cp; 4hpw; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

The subject involves group studies in statistics. The topics vary from year to year and are chosen in accordance with the interests of students and staff, and the availability of staff.

35394

Seminar (Computing)

6cp; 4hpw; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

The subject involves group studies in computing. The topics vary from year to year and are chosen in accordance with the interests of students and staff, and the availability of staff.

35418

Analytic Number Theory

4cp; 3hpw; prerequisite(s): 35314 Pure Mathematics 3B, 35232 Advanced Calculus
Semester offered: subject to demand
Offered at: City campus

This subject covers the topics: divisibility, prime numbers and the fundamental theorem of arithmetic; arithmetical functions and Dirichlet multiplication; some asymptotic analysis involving arithmetical functions; characters of finite Abelian groups; Dirichlet's theorem on primes in arithmetic progressions; the Riemann zeta function; and analytic proof of the prime number theorem.

35419

Advanced Algebra

4cp; 3hpw; prerequisite(s): 35314 Pure Mathematics 3B
Semester offered: subject to demand
Offered at: City campus

Topics covered include: ring theory: commutative rings, integral domains, field of fractions of an integral domain, polynomial rings, principal ideal domains and unique factorisation; module theory: left and right modules, sub-modules, free modules, direct sums of modules, structure of finitely generated modules over a principal ideal domain, application to Abelian groups and linear transformations of a vector space; Galois theory: classical problems of contractibility and solution of algebraic equations by radicals, extension fields and splitting fields of a polynomial, Galois groups, fundamental theorem of Galois theory and applications.

35427

Functional Analysis

4cp; 3hpw; prerequisite(s): 35322 Analysis 2
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: Banach spaces; bounded linear transformations; spectrum; dual space; adjoint operator; Hahn–Banach theorem; compact operators; Riesz theory; Fredholm integral equations; Fredholm alternative; application to potential theory; Hilbert spaces; operators and adjoints; Riesz representation theorem; orthogonality; orthonormal bases; abstract Fourier theory; self-adjoint operators; projections; compact operators; spectral theory for compact operators; application to Sturm-Liouville theory; and Fourier series.

35428

Convexity and Optimisation

4cp; 3hpw; prerequisite(s): 35322 Analysis 2
Semester offered: subject to demand
Offered at: City campus

This subject covers the topics: convex sets in a linear space; affine sets and hyperplanes; algebraic interior and closure; separation theorems; geometric Hahn–Banach theorem; convex functions; epigraphs; subdifferentiability and differentiability; duality; polars; support functions; linear and convex programming; Kuhn–Tucker conditions; general constrained optimisation theory; application to calculus of variations; and introduction to applications in optimal control theory.

35436

Advanced Mathematical Methods

4cp; 3hpw; prerequisite(s): 35334 Applied Mathematics 3B
Semester offered: subject to demand
Offered at: City campus

Topics covered include: generalised functions; Green's functions; applications in electrostatics and electro-magnetism; tensor analysis: tensors from a geometrical viewpoint, metric and curvature tensors, differential forms, Stokes' theorem, applications in special relativity and Maxwell's equations; and use of the symbolic package MathTensor.

35437

Partial Differential Equations

4cp; 3hpw; prerequisite(s): 35335 Mathematical Methods
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: first-order equations; classification of second-order linear equations; wave equation; D'Alembert's formula; Poisson's formula; Huygen's principle; heat equation; maximum principles; regularity of solutions; nonlinear problems; Laplace's equation; properties of harmonic functions; Green's functions; method of images; integral equations; Fredholm theory; application to Dirichlet and Neumann problems; introduction to scattering theory; and scattering of plane waves by cylinders.

35438

Nonlinear Dynamical Systems

4cp; 3hpw; prerequisite(s): 35231 Differential Equations, 35321 Analysis 1
Semester offered: subject to demand
Offered at: City campus

This subject covers the following topics: review of linear systems; nonlinear systems; phase plane analysis; linearisation; local stability and instability; global asymptotic stability; stable and unstable manifolds; limit cycles and strange attractors; introduction to chaos theory; asymptotic methods; the methods of Poincaré and Lindstedt; the method of averaging; and applications to the theory of finance.

35443

Advanced Mathematical Programming

4cp; 3hpw; prerequisite(s): 35342 Optimisation 2
Semester offered: subject to demand
Offered at: City campus

Topics covered include: decomposition methods for large-scale mathematical programming problems; ellipsoid methods; Karmarkar's projective algorithm; stochastic programming; and two-stage stochastic programming problems.

35446

Scheduling Theory

4cp; 3hpw; prerequisite(s): 35342 Optimisation 2, 35447 Discrete Optimisation
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: examples of scheduling problems in manufacturing and service; deterministic and stochastic mathematical models for scheduling, resources, task systems, sequencing constraints, performance measure; polynomial-time scheduling algorithms; computational complexity of scheduling problems; enumerative methods, branch-and-bound algorithms, dynamic programming; approximation algorithms; and scheduling and controlling manufacturing.

35447

Discrete Optimisation

4cp; 3hpw; prerequisite(s): 35111 Discrete Mathematics, 35342 Optimisation 2
Semester offered: subject to demand
Offered at: City campus

This subject covers the topics: examples of discrete optimisation problems; computational complexity, deterministic and nondeterministic Turing machines, NP-completeness and Cook's theorem; examples of the proofs of NP-completeness; cutting plane algorithms; enumerative methods; partitioning algorithms; modern heuristic techniques; and performance guarantees for approximation algorithms.

35448

Dynamic Optimisation

4cp; 3hpw; prerequisite(s): 35241 Optimisation 1, 35361 Probability and Stochastic Processes; corequisite(s): 35447 Discrete Optimisation
Semester offered: subject to demand
Offered at: City campus

Topics covered include: sequential decision processes; deterministic dynamic programming, principle of optimality and recursive relations; relation to other fields of mathematical programming; computational efficiency; stochastic dynamic programming; applications of dynamic programming: equipment replacement, resource allocation, inventory control, (s, S)-policies, dynamic portfolio analysis; Markovian decision processes, policy iteration and linear programming, successive approximation; and applications of the Markov decision model.

35456

Nonlinear Statistical Models

4cp; 3hpw; prerequisite(s): 35353 Regression Analysis
Semester offered: Spring
Offered at: City campus

This subject is an introduction to nonlinear regression models; obtaining least-squares estimates of parameters; obtaining good initial parameter estimates; obtaining convergence of parameter estimates; assessing model nonlinearity; reducing nonlinearity with reparameterisation; and nonlinear mixture models and segmented models.

35457

Multivariate Statistics

4cp; 3hpw; prerequisite(s): 35353 Regression Analysis
Semester offered: Autumn
Offered at: City campus

This subject covers the following topics: multivariate normal distribution: definition, moments, characteristic function, estimation of mean and covariance matrices, Wishart distribution, Hotelling's T2; multivariate linear regression; principal components; factor analysis; and cluster analysis.

35458

Loglinear Modelling

4cp; 3hpw; prerequisite(s): 35353 Regression Analysis
Semester offered: subject to demand
Offered at: City campus

Topics covered include: revision of linear models and exponential families; generalised linear models; applications including logistic regression and contingency tables; modelling using statistical distributions; continuous distribution models; and discrete distribution models.

35459

Linear Models and Experimental Design

4cp; 3hpw; prerequisite(s): 35353 Regression Analysis, 35356 Design and Analysis of Experiments, 35457 Multivariate Statistics
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: linear models: the linear model of less than full rank, the analysis of variance, completely randomised and randomised block designs; response surfaces; incomplete block designs; and repeated measures designs.

35466

Advanced Stochastic Processes

4cp; 3hpw; prerequisite(s): 35322 Analysis 2, 35361 Probability and Stochastic Processes
Semester offered: Autumn
Offered at: City campus

This subject covers the following topics: formal definitions of probability space and stochastic processes; Martingales; Riemann-Stieltjes integration; Brownian motion and related processes; stochastic calculus and stochastic differential equations; and financial applications.

35467

Time Series Analysis

4cp; 3hpw; prerequisite(s): 35361 Probability and Stochastic Processes
Semester offered: subject to demand
Offered at: City campus

This subject deals with non-seasonal and seasonal time series model identification, estimation, diagnostic examination and forecasting. Topics covered include: time series regression; exponential smoothing; spectral analysis; and Box–Jenkins ARIMA models including stationarity/invertibility criteria, transfer functions, intervention analysis and ARCH/GARCH models.

35469

Statistical Consulting[1]

4cp; 3hpw; prerequisite(s): 35353 Regression Analysis, 35355 Quality Control, 35361 Probability and Stochastic Processes; corequisite: enrolment in any 12 credit points of core statistics subjects in the Honours program
Semester offered: subject to demand
Offered at: City campus

This subject is an introduction to the general framework of statistical consulting, including a large practical component. Topics covered include: job estimation and business aspects of consulting; recognition of and searching for appropriate techniques to solve particular problems; constrains imposed by the analysis time frame; communication of results in written, graphical and oral forms to lay and technical audiences; and ethical issues.

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[1] This subject is offered offered subject to demand. 35469 is replaced by 35470 Statistical Consulting Part A and 35471 Statistical Consulting Part B.

35470

Statistical Consulting – Part A[1]

2cp; 1.5hpw; prerequisite(s): 35353 Regression Analysis, 35355 Quality Control, 35361 Probability and Stochastic Process; corequisite(s): enrolment in any 12cp of core statistics subjects in the Honours program.
Semester Offered: subject to demand
Offered at: City campus

This subject is an introduction to the general framework of statistical consulting, including a large practical component. Topics covered include some of job estimation and business aspects of consulting; recognition of and searching for appropriate techniques to solve particular problems; constraints imposed by the analysis time frame; communication of results in written, graphical and oral forms to lay and technical audiences; and ethical issues. This subject is for preparation for 35471 Statistical Consulting – Part B and results will only be allocated in completion of 35471 Statistical Consulting – Part B.

1 35470 Statistical Consulting Part A and 35471 Statistical Consulting Part B replace 35469 Statistical Consulting.

35471

Statistical Consulting – Part B[1]

2cp; 1.5hpw; prerequisite(s): 35470 Statistical Consulting – Part A
Semester Offered: subject to demand
Offered at: City campus

This subject is an introduction to the general framework of statistical consulting, including a large practical component. Topics covered include some of job estimation and business aspects of consulting; recognition of and searching for appropriate techniques to solve particular problems; constraints imposed by the analysis time frame; communication of results in written, graphical and oral forms to lay and technical audiences; and ethical issues.

1 35470 Statistical Consulting Part A and 35471 Statistical Consulting Part B replace 35469 Statistical Consulting.

35483

Numerical Methods for Finance

6cp; 4hpw; prerequisite(s): 35102 Mathematics 2, 35151 Statistics 1, and either 35170 Introduction to Computing or 31465 Object-oriented Programming
Semester offered: Autumn
Offered at: City campus

This subject is an introduction to numerical analysis, including the study of: solution methods for nonlinear equations, systems of linear equations (LU factorisation and iterative methods), interpolation, numerical differentiation and integration, orthogonal polynomials and approximation theory, the Euler and Runge-Kutta methods for initial value problems, and finite difference methods for boundary value problems. Further work on the use of spreadsheet modelling, including coverage of command macros is also dealt with.

35485

Advanced Financial Modelling

4cp; 3hpw; prerequisite(s): 35340 Operations Research Practice
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: options and futures: concepts and valuation models, current issues and developments; and capital structure and the theory of the firm: the effects of corporate and personal taxation on the capital structure of a firm, dividend policy and current issues.

35486

Optimal Control 1

4cp; 3hpw; prerequisite(s): 35231 Differential Equations, 35241 Optimisation 1
Semester offered: Autumn
Offered at: City campus

The subject deals with the problems of the calculus of variations and optimal control. Topics covered include: terminology and notation; historical development; formulation; necessary and sufficient conditions for optimality; the maximum principle; various endpoint conditions; the inclusion of constraints of various types; bang-bang and singular controls; infinite horizon problems; dynamic programming; applications in continuous and discrete time.

35487

Optimal Control 2

4cp; 3hpw; prerequisite(s): 35466 Advanced Stochastic Processes, 35486 Optimal Control 1
Semester offered: Spring
Offered at: City campus

Topics in this subject include: formulation of stochastic control problems; examples of controls; the Hamilton–Jacobi–Bellman equation; necessary and sufficient conditions; reduction to Markov controls; dynamic portfolio strategies; the optimal portfolio selection problem; and discussion of solutions in particular cases.

35491

Honours Seminar A

4cp; 3hpw; prerequisite(s): by consent
Semester offered: Autumn, Spring
Offered at: City campus

This subject provides an opportunity for students to benefit from the specialist knowledge of a visitor to the Department or to undertake a course in an area of specific staff research or knowledge.

35492

Honours Seminar B

4cp; 3hpw; prerequisite(s): by consent
Semester offered: Autumn, Spring
Offered at: City campus

This subject provides an opportunity for students to benefit from the specialist knowledge of a visitor to the Department or to undertake a course in an area of specific staff research or knowledge.

35493

Thesis (Honours) – Part A[1]

8cp; prerequisite(s): by consent
Semester offered: Autumn, Spring
Offered at: City campus

Students in this subject perform an independent investigation of an area of the mathematical sciences chosen in consultation with a supervisor who is appointed by the Head of Department. The subject is for preparation for 35494 – Honours Thesis – Part B and results will only be allocated in completion of 35494 – Honours Thesis – Part B.

1 35493 Thesis (Honours) Part A and 35494 Thesis (Honours) Part B constitute the full-year 35498 Thesis (Honours).

35494

Thesis (Honours) – Part B[1]

8cp; prerequisite(s): 35493 Thesis (Honours) – Part A
Semester offered: Autumn, Spring
Offered at: City campus

Students in this subject perform an independent investigation of an area of the mathematical sciences chosen in consultation with a supervisor who is appointed by the Head of Department.

1 35493 Thesis (Honours) Part A and 35494 Thesis (Honours) Part B constitute the full-year 35498 Thesis (Honours).

35496

Thesis Seminar A

4cp; 3hpw; prerequisite(s): by consent
Semester offered: Autumn, Spring
Offered at: City campus

This subject is intended to provide essential background to the Thesis (Honours) or opportunities for study in areas related to the thesis, complementing the project or providing further research in the area. The subject is operated as a reading course, with the studies being coordinated by the thesis supervisor.

35497

Thesis Seminar B

4cp; 3hpw; prerequisite(s): by consent and 35496 Thesis Seminar A
Semester offered: Autumn, Spring
Offered at: City campus

This subject is intended to provide essential background to the Thesis (Honours) or opportunities for study in areas related to the thesis, complementing the project or providing further research in the area. The subject is operated as a reading course, with the studies being coordinated by the thesis supervisor.

35498

Thesis (Honours)[1]

16cp; prerequisite(s): by consent
Semester offered: Autumn, Spring
Offered at: City campus

Students in this subject perform an independent investigation of an area of the mathematical sciences chosen in consultation with a supervisor who is appointed by the Head of Department.

1 35493 Thesis (Honours) Part A and 35494 Thesis (Honours) Part B constitute the full-year 35498 Thesis (Honours).

35542

Applied Mathematical Programming

6cp; 4hpw; prerequisite(s): admission to the course
Semester offered: subject to demand
Offered at: City campus

This subject covers the following topics: duality theory for linear programming; the dual simplex method, the primal-dual algorithm; parametric linear programming; goal programming; unconstrained nonlinear optimisation, constrained nonlinear optimisation, optimality conditions; feasible-point methods; penalty and barrier methods; introduction to integer programming; and introduction to stochastic programming.

35544

Network Modelling

6cp; 4hpw; prerequisite(s): admission to the course
Semester offered: subject to demand
Offered at: City campus

Topics covered include: network notation; minimal spanning trees; minimal cost network flow problems; the simplex method for network flow problems; transportation problems; the transportation simplex method; assignment and trans-shipment problems; the out-of-kilter algorithm; maximal flow problems; shortest path problems; project planning and scheduling; and CPM cost models.

35545

Further Methods in Operations Research

6cp; 4hpw; prerequisite(s): 35151 Statistics 1, 35342 Optimisation 2
Semester offered: subject to demand
Offered at: City campus

Topics in this subject include: financial, manufacturing, service and transportation applications of discrete optimisation and deterministic and stochastic dynamic programming; and approximation algorithms and modern heuristic techniques for discrete optimisation.

35549

Case Studies in Management Science

6cp; 4hpw; prerequisite(s): 35340 Operations Research Practice, 35342 Optimisation 2, 35363 Simulation Modelling
Semester offered: subject to demand
Offered at: City campus

This subject covers the following topics: problem summary using rich pictures; problem identification; identification of the structure, transformation processes, components, inputs and outputs of a system; project proposal development; mathematical modelling; modelling costs, benefits, constraints, time, uncertainty and multiple goals; validation and performance testing; and sensitivity and error analysis.

35563

Applied Simulation Modelling

6cp; 4hpw; prerequisite(s): admission to the course
Semester offered: subject to demand
Offered at: City campus

Topics covered include: queuing models; activity-cycle diagrams; simulation languages; input data analysis; output data analysis; comparison of alternative designs; variance reduction; and decision theory.

35591

Project (Postgraduate) A

6cp; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

This subject is a supervised investigation of a topic in an area of interest providing the student with additional skills for direct use in employment.

35592

Project (Postgraduate) B

4cp; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

This subject is a supervised investigation of a topic in an area of interest providing the student with additional skills for direct use in employment.

35593

Project (Postgraduate) C

6cp; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

This subject is a supervised investigation of a topic in an area of interest providing the student with additional skills for direct use in employment.

35594

Project (Postgraduate) D

8cp; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

This subject is a supervised investigation of a topic in an area of interest providing the student with additional skills for direct use in employment.

35595

Project (Postgraduate) E

10cp; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

This subject is a supervised investigation of a topic in an area of interest providing the student with additional skills for direct use in employment.

35596

Project (Postgraduate) F

12cp; prerequisite(s): by arrangement
Semester offered: subject to demand
Offered at: City campus

This subject is a supervised investigation of a topic in an area of interest providing the student with additional skills for direct use in employment.

35597

Report (MSc) Part A[1]

12cp; prerequisite(s): by consent
Semester offered: subject to demand
Offered at: City campus

This subject is an applied or theoretical study in an area chosen in consultation with the project supervisor who is appointed by the Head of Department. This is a year-long subject but has been allocated two separate numbers for the two semesters of work. Students are expected to spend three hours per week on their project in Autumn semester and six hours per week in Spring semester. The subject also includes a series of optional master classes to introduce some of the common contemporary web development tools and techniques.

1 35597 Report (MSc) Part A and 35598 Report (MSc) Part B constitute the full-year MSc.

35598

Report (MSc) Part B[1]

12cp; prerequisite(s): by consent and Report (MSc) Part A
Semester offered: subject to demand
Offered at: City campus

This subject is an applied or theoretical study in an area chosen in consultation with the project supervisor who is appointed by the Head of Department. This is a year-long subject but has been allocated two separate numbers for the two semesters of work. Students are expected to spend three hours per week on their project in Autumn semester and six hours per week in Spring semester. The subject also includes a series of optional master classes to introduce some of the common contemporary web development tools and techniques.

1 35597 Report (MSc) Part A and 35598 Report (MSc) Part B constitute the full-year MSc.

3xxxx

Forensic Statistics

6cp; 5hpw; prerequisite(s): 33116 Statistical Design and Analysis or 35151 Statistics 1
Semester offered: Spring
Offered at: St Leonards campus

This subject covers the application of statistical techniques and probability models to forensic cases in the areas of uncertainty, significance and coincidence probabilities, discrimination in discrete and continuous data, relevant population grouping and the analysis of genetic profiles and lineages. The above is illustrated with reference to practical examples and databases of forensic evidence.

60103

Nanosciences 1

6cp; 5hpw
Semester offered: Autumn
Offered at: City campus

This is an introductory subject to the study of nanotechnology. The subject introduces four main areas that are central to understanding the importance that nanoscale science has to the engineering of materials and processes for the 21st century. These four areas are nanoscale properties of materials, nanotechnology in biology and nature, biomimetics, and nanoscale measurement and analysis. These areas are incorporated into the subject as individual modules of study, each taught by an expert in that field. Innovative teaching methods are utilised to convey the cutting-edge material presented in the subject, including site visits to specialised research institutions and laboratories. Assessment is by four group-work assignments and presentations, and a class-test conducted at the completion of each of the four modules.

60104

Nanosciences 2

6cp; prerequisite(s): 60103 Nanosciences 1
Semester offered: Spring
Offered at: City campus

The subject is a continued study in the field of nanotechnology and provides broad knowledge in various areas of nanotechnology. The subject covers three main areas: (i) synthesis and property analysis of nanomaterials including carbon tubes, coatings, metals, polymers and inorganic materials; (ii) applications of nanomaterials and nanotechnology in environment and energy industry, computers and electronic devices, optics, sensors, nanomachines and other engineering areas; and (iii) computing, lithography, imaging and measurement techniques. Teaching methodology includes lectures and tutorials, site visits to specialised research laboratories and group projects.

60501

X-ray Analytical Methods

3cp; five-day block mode; prerequisite(s): 68041 Physical Aspects of Nature; 68101 Foundations of Physics; or completion of three stages of the BSc or BE full-time program
Semester offered: Summer, Spring
Offered at: City campus

This subject is designed to train students in the application of X-ray diffraction and X-ray fluorescence to the analysis of materials by providing a practical and theoretical understanding of X-ray techniques using modern equipment in a multidisciplinary environment. Students enrolled in the degree programs within the physical sciences discipline (chemistry, forensic science, geoscience, materials science and applied physics) will find this elective relevant and students tailor lab programs to applications commonly encountered in their relevant disciplines. Student assessment includes daily class tests worth 20 per cent and experiments and assignments worth 80 per cent. These are designed to enhance understanding of X-ray analysis and equipment, develop experimental skills, data analysis and interpretation techniques. A major hands-on X-ray analysis must be completed in a relevant discipline to consolidate student experimental design, data analysis and interpretation skills.

60502

Electron Microscopy and Microanalysis

3cp; five-day block mode; prerequisite(s): 68041 Physical Aspects of Nature; 68101 Foundations of Physics; or completion of three stages of the BSc or BE full-time program
Semester offered: Summer, Spring
Offered at: City campus

This subject investigates the application of electron microscopy and microanalysis to the analysis of materials. The subject integrates lectures and labs to provide both a practical and theoretical understanding of microscopy and microanalysis techniques using modern equipment in a multidisciplinary environment. This elective is relevant to students undertaking any degree program within the physical sciences discipline (chemistry, forensic science, geoscience, environmental science, materials science and applied physics). Students can tailor laboratory programs to applications commonly encountered within particular disciplines. Subject assessment includes daily class tests worth 20 per cent, experimental assignments worth 30 per cent and a major project worth 50 per cent. Open-book class tests are given to reinforce theoretical concepts underpinning microscopy and microanalysis. Experimental assignments and the major hands-on project enhance understanding and develop experimental skills.

60767

PhD Thesis (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 177.

607681

PhD Thesis (PT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 177.

60777

MSc Thesis (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 176.

60778

MSc Thesis (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 176.

60811

Professional Scientific Practice A

6cp; prerequisite(s): satisfactory completion of at least two years of an approved Bachelor's program; corequisite: engagement in an approved program of industrial training leading to a minimum of 30 weeks of work undertaken by learning contract
Semester offered: Autumn
Offered at: City, St Leonards campuses

This subject is one of two subjects which constitute the Diploma in Scientific Practice and a learning contract must be negotiated between the student and the Industrial Training Coordinator. Approved industrial experience is supplemented by a program designed to enhance the student's appreciation of the technical, organisational, social, cultural, ethical and legislative dimensions of workplace practice in science. This subject is normally taken during the first half of the student's industrial training. It focuses on the attributes required in a successful application for work placement, the orientation to workplace practices and the analysis of the student's early workplace experiences. This subject may include an assessment of the student's work by the workplace supervisor.

60812

Professional Scientific Practice B

6cp; prerequisite(s): 60811 Professional Scientific Practice A, satisfactory completion of at least two years of an approved Bachelor's program; corequisite: a minimum of 30 weeks of approved industrial training undertaken by learning contract
Semester offered: Spring
Offered at: City, St Leonards campuses

This subject combines with 60811 Professional Scientific Practice B to constitute the Diploma in Scientific Practice and a learning contract must be negotiated between the student and the Industrial Training Coordinator. Industrial experience is supplemented by a program designed to enhance the student's appreciation of the technical, organisational, social, cultural, ethical and legislative dimensions of workplace practice in science. This subject is normally taken during the second half of the student's industrial training. It focuses on the student's overall experience of work and as appreciation of the wider dimensions of work. This subject includes an assessment of the student's work by the workplace supervisor.

60987

PhD Thesis (PT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 177.

60988

PhD Thesis (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

The course is examined through presentation of a thesis. See course description on page 177.

60990

Research Methodology

12cp; block mode
Offered at: subject to demand

This subject assists students to demonstrate that they have the capacity for critical thinking, soundness of judgment, and level of comprehension equivalent to that expected of doctoral candidates. It assists in the development of skills necessary for the mounting and implementation of research programs, as appropriate for each student's discipline, and promotes understanding of key concepts regulating the research environment. Students undertaking the subject are required to submit a critical review of the literature on an agreed topic, critique research proposals and demonstrate an understanding of the background issues involved in scientific process.

60991

Applied Research Skills

12cp; block mode
Semester offered: n/a
Offered at: subject to demand

This subject develops advanced knowledge and skills in experimental design and data analysis. It covers areas such as hypothesis generation in testing, and application of univariate and multivariate statistical techniques such as data analysis. Specialist skills modules in scientific computing, advanced measurement and bioinformatics and other areas may be chosen or negotiated with the Subject Coordinator according to the student's special workplace or career requirements.

60992

Managing Science and Scientists

12cp; block mode
Semester offered: n/a
Offered at: subject to demand

This subject provides the essential knowledge and concepts to facilitate skills development in research and development management and staff management according to each student's current or proposed workplace environment. Students who have successfully completed the subject will have the capability to develop their management skills to an advanced state. The subject covers areas such as project management and organisation, science personnel development, and the management of risk, intellectual property and research output quality.

60993

Research Project Proposal

12cp; block mode
Semester offered: n/a
Offered at: subject to demand

This subject is the capstone subject for the coursework component of the Doctor of Technology in Science program. It sets the scene and guidelines for the research project component to be completed during the remainder of the student's candidature. It requires the student to bring together and apply all the knowledge, concepts and skills so far gained in the DTech program. It therefore invites the student to demonstrate substantial achievement in all areas developed during the other subjects in the coursework component of the program. Students exiting the program with the Master of Technology will have demonstrated their readiness to undertake research, development and management in science at the completion of this subject.

60xxx

Surface Processes

6cp; 5hpw; prerequisite(s): 33190 Mathematical Modelling for Science or equivalent; 68201 Physics in Action or 65201 Chemistry 2C or equivalent
Semester offered: Spring
Offered at: City campus

All materials have surfaces, and many properties depend upon how the surface interacts with its surroundings. This subject begins with the concepts required to describe surfaces such as their symmetry and physico-chemical structure, and experimental methods for characterising and preparing surfaces. Using these basic concepts the subject then develops methods for describing how a surface interacts with its surroundings, whether this be a gas, liquid or solid. The subject investigates the properties of surfaces both from a macroscopic and microscopic viewpoint, and contains a strong hands-on component to familiarise students with the tools of surface science. The material presented spans the traditional science disciplines and is therefore of interest to a wide range of science students. Surface processes are also a fundamental aspect of nanotechnology, and surface properties form the basis for producing many types of nano-devices or materials. This subject forms part of the core of the nanotechnology course.

60xxx

Nanomaterials

6cp; 5hpw; prerequisite(s): 33190 Mathematical Modelling for Science or equivalent; 68201 Physics in Action or 65201 Chemistry 2C or equivalent; 60xxx Scanning Probe and Electron Microscopy
Semester offered: Spring
Offered at: City, St Leonards campuses

This subject contains two complementary strands. The first deals with methods for producing nanostructures, nanostructured materials and nanoscale devices, using deposition, growth and self-assembling processes. The second uses real world examples to demonstrate how the unique properties of these materials can be tailored for a wide range of applications from novel building materials and medical prosthetics to the next generation of electronic devices. This subject forms the core of material for stage 4 Nanotechnology students and builds upon the material presented in 60xxx Scanned Probe Microscopy and Electron Microscopy.

60xxx

Scanned Probe and Electron Microscopy

6cp; 5hpw; prerequisite(s): 33190 Mathematical Modelling for Science or equivalent; 68201 Physics in Action or 65201 Chemistry 2C or equivalent
Semester offered: Autumn
Offered at: City, St Leonards campuses

Characterisation and production of materials, devices, biological systems with nanoscale features requires analysis tools with extreme precision. This is a central issue in nanotechnology and many contemporary areas of materials science. The advent of techniques such as scanning tunnelling or atomic force microscopy allow us to view and manipulate objects at this level. Electron microscopy has a more established history, but in more recent times has turned out to be an invaluable tool to the nanotechnologist. This is a hands-on subject that introduces the concepts behind these techniques, their use and application in many areas of science and technology. Recent developments in the techniques are introduced, and students have the opportunity to gain hands-on experience using a variety of scanning probe and electron microscopes.

65012

Chemistry 1A

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

This subject is an introduction to some fundamental concepts in chemistry. Topics covered are: chemicals and chemical reactions; atomic structure; periodic table; chemical bonding; enthalpy changes in chemical reactions; and the structures and properties of solids. There is a laboratory program which complements the learning experiences in the lectures and tutorials. Other important aims of this subject are to enhance students' thinking skills, to foster their abilities to work cooperatively with their peers and to assist in the development of their communication skills.

65022

Chemistry 2A

6cp; 6hpw; prerequisite(s): 65012 Chemistry 1A or 65101 Chemistry 1C
Semester offered: Autumn, Spring
Offered at: City campus

This subject builds on the foundation studies in 65012 Chemistry 1A or 65101 Chemistry 1C. It seeks to give students completing one full-time year a broad and general understanding of inorganic, organic and physical chemistry concepts, knowledge and practice.

Topics covered are: chemical equilibrium, acid-base theory, and chemical kinetics in physical chemistry; coordination compounds in inorganic chemistry; and in organic chemistry, molecular structures and chemical reactions of carbon compounds including alkanes, alkenes, alkynes and aromatic hydrocarbons; alcohols, phenols and ethers; aldehydes, ketones, carboxylic acids , esters and amides; amines; and halogen compounds. There is a laboratory program which complements the learning experiences in the lectures and tutorials. The subject also aims to enhance students' thinking skills, to foster their ability to work cooperatively with their peers, and to assist in the development of their communication skills.

65062

Extractive Metallurgy / Metallurgical Chemistry

6cp; 6hpw; prerequisite(s): all Stage 1, 2 and 3 subjects in the Applied Chemistry degree program
Semester offered: usually Spring
Offered at: City campus

This subject covers occurrence of minerals; comminution and the theory of time particles; and extractive metallurgy including physical separation methods, flotation, hydrometallurgy and pyrometallurgy.

65101

Chemistry 1C

6cp; 6hpw; prerequisite(s): assumed knowledge: core of HSC 2-unit Chemistry or equivalent
Semester offered: Autumn, Spring
Offered at: City campus

This subject is an introduction to some fundamental concepts in chemistry. Topics covered are: chemicals and chemical reactions; atomic structure; periodic table; chemical bonding; enthalpy changes in chemical reactions; and the structures and properties of solids. There is a laboratory program which complements the learning experiences in the lectures and tutorials. Other important aims of this subject are to enhance students' thinking skills, to foster their abilities to work cooperatively with their peers and to assist in the development of their communication skills.

65201

Chemistry 2C

6cp; 6hpw; prerequisite(s): 65101 Chemistry 1C or equivalent
Semester offered: Autumn, Spring
Offered at: City campus

This subject builds on the foundation studies in 65012 Chemistry 1A or 65101 Chemistry 1C. It seeks to give students completing one full-time year a broad and general understanding of inorganic, organic and physical chemistry concepts, knowledge and practice.

Topics covered are: chemical equilibrium, acid-base theory, and chemical kinetics in physical chemistry; coordination compounds in inorganic chemistry; and organic chemistry, molecular structures and chemical reactions of carbon compounds including alkanes, alkenes, alkynes and aromatic hydrocarbons; alcohols, phenols and ethers; aldehydes, ketones, carboxylic acids , esters and amides; amines; and halogen compounds. There is a laboratory program which complements the learning experiences in the lectures and tutorials. The subject also aims to enhance students' thinking skills, to foster their ability to work cooperatively with their peers, and to assist in the development of their communication skills.

65202

Organic Chemistry 1

6cp; 6hpw; prerequisite(s): 65022 Chemistry 2A or 65201 Chemistry 2C
Semester offered: Autumn
Offered at: City campus

The structures and reactions of the important families of organic compounds (aliphatic and aromatic hydrocarbons, halogen compounds, alcohols, ethers, carbonyl compounds, carboxylic acid derivatives and amines) are studied with emphasis on stereochemistry, reaction mechanisms and organic synthesis. Lecture and tutorial material is closely integrated with laboratory exercises in which students gain experience in techniques used in performing reactions, and in isolating, purifying and characterising products.

65241

Principles of Forensic Science

6cp; 4hpw
Semester offered: Spring
Offered at: City campus

This subject provides a broad and sound overview of forensic science. It is designed to introduce the different disciplines, principles and concepts peculiar to forensic science. It covers, in the forensic context, the following areas: history, general definitions and concepts, sub-disciplines, methodology and methods, introduction to crime scene, trace typology, function of the expert, legal system, judicial admissibility, ethical considerations, interpretation of forensic evidence. Lectures are complemented by tutorials/workshops involving guest speakers. Principles of Forensic Science is a core subject for the Forensic Science course and an elective for students in other related courses.

65306

Analytical Chemistry 1

6cp; 5–6hpw; prerequisite(s): 65201 Chemistry 2C or equivalent
Semester offered: Spring
Offered at: City campus

Lecture, laboratory and computer-aided instruction components of the course cover: (a) spectroscopic methods of analysis including mass spectrometry and infra-red, ultraviolet-visible and NMR spectroscopy; (b) separation techniques including solvent extraction, distillation, precipitation, and a range of chromatographic methods; (c) volumetric techniques including acid-base, redox, non-aqueous, and potentiometric methods; and (d) errors, calibration and interpretation of analytical data.

65307

Physical Chemistry 1

6cp; 4.5hpw; prerequisite(s): 65022 Chemistry 2A or 65201 Chemistry 2C, 33190 Mathematical Modelling for Science
Semester offered: Autumn
Offered at: City campus

This subject is designed to provide students with a working knowledge of chemical thermodynamics, optical spectroscopy, and chemical kinetics, which can then be applied to other subjects within the course. Students are introduced to fundamental concepts in these areas and learn how to apply their principles in problem-solving situations.

Lectures are complemented by tutorials and relevant practical experiments.

65341

Forensic Imaging

6cp; 5hpw; prerequisite(s): all Stage 1 subjects in the Forensic Science degree; 65241 Principles of Forensic Science, priority is given to students enrolled in the Forensic Science course
Semester offered: Autumn
Offered at: City campus

This subject is specifically designed for forensic science students. It covers application of light theory in forensic science (absorption/reflection, UV, IR, diffusion, episcopic coaxial illumination, polarised light, photoluminescence, etc.), technical and forensic photography (use of large and medium format and single lens reflex cameras), image treatment, optical and electron microscopy, and comparison microscopy. Lectures are complemented by an extensive practical program given in the form of workshops. Potential elective students must consult the Subject Coordinator, Dr Claude Roux on telephone (02) 9514 1718 before enrolling in this subject.

65409

Analytical Chemistry 2

6cp; 4.5hpw; prerequisite(s): 65306 Analytical Chemistry 1
Semester offered: Autumn
Offered at: City campus

Lecture and laboratory topics such as: separation techniques; gas chromatography; instrumentation. Sample preparation and derivatisation. Columns-packed and bonded phase. GC detectors and their application. HPLC: basic theory and instrumentation. Sample preparation. Normal and reversed phase columns. Ion-pair chromatography and gel permeation chromatography. Ion exchange resins and chromatography. Method validation and quality assurance. Electrophoresis: plate and capillary, laboratory automation: robotic techniques. Auto samplers. Post-column derivatisation methods.

65410

Chemical Safety and Legislation

6cp; 3hpw; prerequisite(s): 65201 Chemistry 2C or equivalent
Semester offered: Autumn
Offered at: City campus

NSW Occupational Health and Safety Act and role of various governmental agencies. Toxic effects of chemicals. Classification of dangerous goods. Precautionary labels and material safety data sheets. Corrosives, oxidisers and explosives. Compressed gases. Personal protective equipment PPE in the laboratory. Waste. Good laboratory practice. Good manufacturing practice. QC/QA issues.

65411

Inorganic Chemistry 1 (Transition Metal Chemistry)

6cp; 4.5hpw; prerequisite(s): 65201 Chemistry 2C or 65022 Chemistry 2A or equivalent
Semester offered: Spring
Offered at: City campus

Transition metals: electron configurations and oxidation states. Fundamentals of coordination chemistry. Crystal field theory. Spectral and magnetic properties of metal complexes. Chelating agents and applications in analytical chemistry, industrial processes and medicine.

65508

Organic Chemistry 2 (Structure Elucidation and Synthesis)

6cp; 4.5hpw; prerequisite(s): 65202 Organic Chemistry 1
Semester offered: Spring
Offered at: City campus

This subject builds on previous studies of organic chemistry and demonstrates the use of combined chemical and spectroscopic methods UV, IR, NMR and MS in structural elucidation of organic compounds. It also aims to develop the ability to make planned use of simpler organic reactions in the multistage synthesis of new aliphatic and aromatic compounds. The lectures are complemented by a relevant practical program and tutorial sessions.

65509

Inorganic Chemistry 2 (New Inorganic Materials)

6cp; 4.5hpw; prerequisite(s): 65411 Inorganic Chemistry 1 (Transition Metal Chemistry)
Semester offered: Autumn
Offered at: City campus

Structures of crystalline and non-crystalline inorganic solids: crystallography and X-ray diffraction and fluorescence. Bioinorganic chemistry including metalloproteins and biominerals. Solid-state inorganic chemistry including applications of Crystal Field Theory to advanced structures. Synthetic biomaterials. Sol-gel science.

65521

Applied Organic Chemistry[1]

6cp; 6hpw; prerequisite(s): all Stage 4 subjects
Semester offered: Autumn
Offered at: City campus

This subject looks at selected advanced topics in organic chemistry, focusing on organic reaction mechanisms, photochemistry and spectroscopic elucidation of organic structures.

[1] This subject may not be offered every year.

65541

Physical Evidence 1

6cp; 6hpw; prerequisite(s): 65241 Principles of Forensic Science, 65341 Forensic Imaging
Semester offered: Autumn
Offered at: City campus

This subject covers the nature, value and relevance of several types of physical evidence. It follows on from 65241 Principles of Forensic Science and 65341 Forensic Imaging. It covers fingerprint detection and identification; miscellaneous individual traces, tooth marks, lip prints, nail marks, etc.; path marks, footwear impression, tyre impression, etc.; weapons including firearms, bullet/cartridge identification, gunshot residues, firing distance; motor vehicle globes and other light; and miscellaneous trace evidence, matches, cigarettes/tobacco, building and safe insulation materials cordage, buttons, wood, and glass. Lectures are complemented by a practical program involving mock cases.

65542

Forensic Toxicology 1

6cp; 4hpw; prerequisite(s): 65306 Analytical Chemistry 1; corequisite(s): 65508 Organic Chemistry 2 (Structure Elucidation and Synthesis), 91141 Biological Evidence
Semester offered: Autumn
Offered at: City campus

The subject is designed as an introduction to the fundamentals of forensic toxicology. It involves specific forensic material, general pharmacology and toxicology. The practical component is designed to reinforce topics covered in lectures and seeks to give students experience in analytical problems specific to biological systems, which relies to some extent on the techniques they learnt in both 65306 Analytical Chemistry 1 and 91141 Biological Evidence. The subject also gives students an overview of State and federal laws concerning licit and illicit drugs and poisons.

65543

Crime Scene Investigation

6cp; 4hpw; prerequisite(s): 65241 Principles of Forensic Science
Semester offered: Autumn
Offered at: City campus

This subject provides a sound teaching in crime scene investigation. It is designed to introduce the different principles and concepts peculiar to crime scene. It covers the following areas: aims of the crime and related investigation; preservation, recording and processing of crime scene; preservation, search and collection of evidence; on-site screening tests; scene recontruction; examples of scenes (break–entry, homicide, traffic and other accidents, fire, explosion, disaster); common types of evidence; ad-hoc forms and software assisting crime science investigation. Lectures are complemented by tutorials/workshops involving guest speakers. Potential elective students should consult the Subject Coordinator.

65606

Analytical Chemistry 3

6cp; 4.5hpw; prerequisite(s): 65306 Analytical Chemistry 1
Semester offered: Spring
Offered at: City campus

This subject covers lecture and laboratory topics such as: (a) electrochemical analysis methods, ion selective electrodes, calibration methods, standard addition, etc.; (b) spectroscopic methods such as AA, ICP, ICP/MS and

XRF; trace analysis and matrix effects; (c) estimation of uncertainty in analytical chemistry, accuracy, precision gross errors, sensitivity, selectivity and linearity; and (d) error propagation in analytical chemistry, systematic and random errors.

65607

Physical Chemistry 2

6cp; 4.5hpw; prerequisite(s): 65307 Physical Chemistry 1, 65411 Inorganic Chemistry 1 (Transition Metal Chemistry)
Semester offered: Spring
Offered at: City campus

The subject builds on 65307 Physical Chemistry 1, exploring more advanced topics in chemical kinetics, electrochemistry, and spectroscopy. The principles of infra red and Raman spectroscopic instrumentation are included, along with the application of these techniques to chemical imaging.

65621

Environmental Chemistry

6cp; 6hpw; prerequisite(s): 65022 Chemistry 2A or 65201 Chemistry 2C or equivalent
Semester offered: Spring
Offered at: City campus

This subject focuses on the importance of chemical changes in the natural environment, and those resulting from human activity. Chemical changes are examined for both inorganic matter (soil clays) and organic matter (plant materials), having as their end products humic substances, petroleum, and coal. Particular emphasis is placed on changes in organic molecular structure. Important pollutants including halogenated hydrocarbons, and the oxides of nitrogen, sulfur and carbon are discussed, in the contexts of their origins and their effects on the geosphere, hydrosphere and biosphere.

65641

Physical Evidence 2

6cp; 6hpw; prerequisite(s): 65541 Physical Evidence 1
Semester offered: Spring
Offered at: City campus

This subject complements the material covered in 65541 Physical Evidence 1. It covers forensic analysis of soil, paint, fibres, hairs and documents. Lectures are complemented by an extensive practical program involving mock cases. At the end of this subject, students should be able to select appropriate analytical procedures, analyse, interpret and write an expert witness report describing the forensic analysis of the material covered in 65541 Physical Evidence 1 and 65641 Physical Evidence 2.

65642

Forensic Toxicology 2

6cp; 4hpw; prerequisite(s): 65542 Forensic Toxicology 1, 65508 Organic Chemistry 2 (Structure Elucidation and Synthesis)
Semester offered: Spring
Offered at: City campus

The subject is designed and delivered as an advanced course covering specific aspects of forensic toxicology. These aspects are approached from a practical perspective, dealing in some depth with analytical details of the areas covered. The subject is designed to be taught alongside 65741 Chemistry and Pharmacology of Illicit Drugs, enabling the pharmacology and toxicology of drugs such as cannabis, amphetamines, opiates and cocaine, to be taught in parallel with other aspects of these drugs.

65741

Chemistry and Pharmacology of Illicit Drugs

6cp; 5hpw; prerequisite(s): 65508 Organic Chemistry 2 (Structure Elucidation and Synthesis), 65409 Analytical Chemistry 2
Semester offered: Autumn
Offered at: City campus

This subject aims to familiarise students with the pharmacology, chemistry, methods of analysis and legal status of a wide range of drugs of abuse. It examines the pharmacology of the various classes of drugs (opioids, amphetamine and other stimulants, hallucinogens, cannabis, miscellaneous drugs including alcohol and tobacco products) route of synthesis and profiling of drugs to determine route of manufacture; sampling and analysis protocols; State and federal legislation covering the manufacture and importation of certain drugs; case studies; and social issues.

65742

Fire and Explosion Investigation

6cp; 3hpw; prerequisite(s): 65641 Physical Evidence 2
Semester offered: Autumn
Offered at: City campus

This subject seeks to show how a systematic scientific examination of a fire or explosion scene can lead to the establishment of its origin and cause. It covers general definitions;

fire insurance and crime statistics; combustion process, external and internal scene examination, fire origin and cause determination; physical properties of materials, gases, aerosols; spontaneous combustion; kitchen fires, cigarettes, heaters, motor vehicle fires, electric appliances; accelerants, explosives; sniffers and canines; and computer modelling of fires.

65743

Complex Forensic Cases (Chemistry)

6cp; 6hpw; prerequisite(s): 65641 Physical Evidence 2, 65642 Forensic Toxicology 2, 91141 Biological Evidence; corequisite(s): 79024 Complex Forensic Cases (Law)
Semester offered: Autumn
Offered at: City campus

This subject is designed as an advanced practical course where the students apply techniques and principles gained in previous forensic subjects to the analysis of mock cases. It aims to familiarise the students with the management of a complex forensic case involving more than one type of evidence. It involves forensic analysis of material previously studied, preparation of expert witness reports and preparation for presenting evidence in a court environment.

65861

Honours (Chemistry) 1

24cp; prerequisite(s): BSc in Applied Chemistry or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: City campus

Study in this subject is designed to enhance the skills and knowledge necessary for research in chemistry. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigations in an area of interest. The data collected is then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis which comprises the main assessment component. In addition, two hours per week are devoted to advanced topics of current research interest, presented through specialist lectures or seminars.

65862

Honours (Chemistry) 2

24cp; prerequisite(s): BSc in Applied Chemistry or equivalent three-year degree; 65861 Honours (Chemistry) 1
Semester offered: Autumn, Spring
Offered at: City campus

For subject description, refer to 65861 Honours (Chemistry) 1.

65856

Forensic Research Project

24cp; at least 25hpw; prerequisite(s): all Stage 1–7 subjects
Semester offered: Spring
Offered at: City campus

A research project on specific aspects of forensic science is conducted under the joint supervision of a member of the academic staff of the University and possibly an external (industrial) supervisor. Some of the work may have to be conducted at sites away from UTS.

66014

Hydrogeology

6cp
Semester offered: Autumn, Spring[1]
Offered at: City campus, distance

This subject, conducted through a combination of classroom and lab sessions, provides a knowledge of geological occurrence and hydraulics of groundwater flow, exploration techniques, extraction engineering and borefield management.

1 Offered in distance mode only in Spring semester.

66015

Hydrogeochemistry

6cp
Semester offered: Autumn, Spring[1]
Offered at: City campus, distance

This subject, conducted through a combination of classroom and lab sessions, covers the chemical basis for understanding how the chemistry of groundwater evolves both naturally and in the case of contamination. Both practical field measurement and computer modelling are covered.

1 Offered in distance mode only in Spring semester.

66018

Groundwater Geophysics

6cp
Semester offered: Autumn
Offered at: City campus, distance

This subject, conducted through a combination of classroom and lab sessions, presents an advanced application of geophysical techniques for groundwater research and resource management, and includes contamination assessment and monitoring. The focus is on seismic, electrical and electromagnetic methods.

66021

Groundwater Science Projects (M) (FT)

24cp
Semester offered: Spring (offered in Autumn only if all other subjects have been completed)
Offered at: City campus

These projects provide students with the opportunity to research specific hydrogeology groundwater resource or contamination problems. The depth and extent of research varies with credit points required. Topics include investigation consisting of one or more of: modelling, laboratory experiments, field work related to hydrogeology and groundwater management, contaminant transport and processes, waste disposal and groundwater impact.

66022

Groundwater Science Projects (GD) (FT)

12cp
Semester offered: Spring (offered in Autumn only if all other subjects have been completed)
Offered at: City campus

This subject is the same as 66021 Groundwater Science Projects (M) (FT) but at a reduced scale. These projects provide students with the opportunity to research specific hydrogeology groundwater resource or contamination problems. The depth and extent of research varies with credit points required. Topics include investigation consisting of one or more of: modelling, laboratory experiments, field work related to hydrogeology and groundwater management, contaminant transport and processes, waste disposal and groundwater impact.

66023

Graduate Science Projects (M) (PT)

This subject has been replaced by 66046 Groundwater Science Projects (M) Part A (PT) and 66047 Groundwater Science Projects (M) Part B (PT).

66024

Graduate Science Projects (GD) (PT)

This subject has been replaced by 66048 Groundwater Science Projects (GD) Part A (PT) and 66049 Groundwater Science Projects (GD) Part B (PT).

66025

Contaminated Site Management

6cp
Semester offered: Autumn
Offered at: City campus, distance

Students develop an understanding of the methodology and technology used in the assessment and remediation of contaminated sites.

The subject content includes: site assessment methodology, physical, chemical and biological properties and behaviour of contaminants, health issues, risk assessment, and site assessment technology. Further details are available online at:

http://groundwater.ncgm.uts.edu.au/ncgm/

or contact the Subject Coordinator on telephone (02) 9514 2614.

66036

Identifying Groundwater Dependent Ecosystems

6cp
Semester offered: Autumn
Offered at: City campus, distance

This subject is designed to provide students with the knowledge required to identify groundwater dependent ecosystems *in situ*. A brief overview of the various major ecosystems in Australia is given, including their defining features (structure, composition and climate envelope). Sources of water (rainwater, soil water, groundwater, fog, riparian water), patterns of water use (daily and seasonal), and the various methodologies available to measure ecosystem water use and the source(s) of water used by ecosystems are discussed. Factors that influence ecosystem water use (including climate, vegetation cover and water availability), are reviewed, as are definitions of ecosystem dependency on groundwater. While emphasis is given to terrestrial systems, some discussion of aquatic and cave ecosystems is made, where appropriate. Students must attend a three-day field-based workshop or show equivalent knowledge or skills.

66037

Ecosystem Vulnerability and Valuation

6cp
Semester offered: Autumn
Offered at: City campus, distance

Students completing this subject will be able to understand approaches for identifying ecosystem uniqueness, vulnerability and valuation. Various social, physical and biological stresses on ecosystems and measures of vulnerability are studied. Valuation methods that use monetary and non-monetary values as well as participatory processes are discussed.

66038

Policy and Management for Groundwater Dependent Ecosystems

6cp
Semester offered: Spring
Offered at: City campus, distance

This subject provides an overview of the various policies in place or in preparation across Australia for ensuring the sustainability of groundwater dependent ecosystems. Managing a groundwater resource subject to environmental provisions entails trade-offs between the environment and other users of the water resource. This study focuses on definition of the management area, recognition of the regulatory and community stakeholders, management tools available for mediating potential conflict, performance measures for successful management, and spatial/temporal scales of management.

66039

Professional Practice (Environmental)

6cp
Semester offered: Autumn
Offered at: City campus, distance

Students completing this course prepare to learn and operate within both the course and professional context. It assists students in developing information and communication literacy, independent learning skills and collaborative practices. Students need to demonstrate an awareness of how sustainability, ethics, culture and social responsibility relate to their professional context. Students are generally expected to attend an on-campus workshop.

66040

Introduction to Research Project A

12cp
Semester offered: Spring, Autumn
Offered at: City campus

Students in this subject demonstrate their capacity to undertake an in-depth study into a specific topic. In consultation with a supervisor, students are expected to identify a topic for research. The proposal developed around this topic identifies research aims, current knowledge about the topic, methods for data collection and analysis and approaches to disseminating outcomes from the project. Issues such as costing, personnel, quality control and assurance, ethics and environmental health and safety need to be considered. Outcomes from this subject include a seminar and a written report. This subject is supervised by the Faculty of Science.

66041

Introduction to Research Project B

12cp
Semester offered: Spring, Autumn
Offered at: City campus

Students, after completing this subject, will have demonstrated their capacity (or ability) to undertake an in-depth study into a specific topic. In consultation with a supervisor, students are expected to identify a topic for research. The proposal developed around this topic identifies research aims, current knowledge about the topic, methods for data collection and analysis and approaches to disseminating outcomes from the project. Issues such as costing, personnel, quality control and assurance, ethics and environmental health and safety are considered. Outcomes from this subject include a seminar and a written report. This subject is supervised by the National Centre for Groundwater Management.

66042

Research Project (Major) A

12cp; prerequisite(s): 66040 Introduction to Research Project
Semester offered: Spring, Autumn
Offered at: City campus

Students apply their knowledge and skills through an in-depth and guided study of a specific topic. This normally involves the application of the proposal developed in 66040 Introduction to Research Project A or 66041 Introduction to Research Project B. The type of studies undertaken could involve experimental investigation, the application of technology, research into a technical or management issue or an extensive critique of the literature. Industry-based projects are welcomed. An outcome of the project is a written report or publication. The report should review the topic, present any findings from the study and evaluate the implications of those findings. This subject is supervised the Faculty of Science.

66043

Research Project (Major) B

12cp; prerequisite(s): 66041 Introduction to Research Project
Semester offered: Spring, Autumn
Offered at: City campus

Students apply their knowledge and skills through an in-depth and guided study of a specific topic. This normally involves the application of the proposal developed in the subject 66040 or 66041. The types of studies undertaken could involve experimental investigation, the application of technology, research into a technical or management issue or an extensive critique of the literature. Industry-based projects are welcomed. An outcome of the project is a written report or publication. The report should review the topic, present any findings from the study and evaluate the implications of those findings. This subject is supervised by the National Centre for Groundwater Management.

66046

Groundwater Science Projects (M) Part A (PT)[1]

12cp
Semester offered: Spring (offered in Autumn only if all other subjects have been completed)
Offered at: City campus

These projects provide students with the opportunity to research specific hydrogeology groundwater resource or contamination problems. The depth and extent of research varies with credit points required. Topics include investigation consisting of one or more of: modelling, laboratory experiments, field work related to hydrogeology and groundwater management, contaminant transport and processes, waste disposal and groundwater impact.

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1 66046 Groundwater Science Projects (M) Part A (PT) and 66047 Groundwater Science Projects (M) Part B (PT) replace 66023 Groundwater Science Projects (M) (PT).

66047

Groundwater Science Projects (M) Part B (PT)[1]

12cp; prerequisite(s): 66046 Groundwater Science Projects Part-time (Masters) Part A
Semester offered: Spring (offered in Autumn only if all other subjects have been completed)
Offered at: City campus

These projects provide students with the opportunity to research specific hydrogeology groundwater resource or contamination problems. The depth and extent of research varies with credit points required. Topics include investigation consisting of one or more of: modelling, laboratory experiments, field work related to hydrogeology and groundwater management, contaminant transport and processes, waste disposal and groundwater impact.

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1 66046 Groundwater Science Projects (M) Part A (PT) and 66047 Groundwater Science Projects (M) Part B (PT) replace 66023 Groundwater Science Projects (M) (PT).

66048

Groundwater Science Projects (GD) Part A (PT)[1]

6cp
Semester offered: Spring (offered in Autumn only if all other subjects have been completed)
Offered at: City campus

This subject is the same as 66021 Groundwater Science Projects (M) (FT), and 66046 and 66047 Groundwater Science Projects (M) Part A and Part B (PT), but at a reduced scale.

[1] 66048 Groundwater Science Projects (GD) Part A (PT) and 66049 Groundwater Science Projects (GD) Part B (PT) replace 66024 Groundwater Science Projects (GD) (PT).

66049

Groundwater Science Projects (GD) Part B (PT)[1]

6cp; prerequisite(s): 66048 Groundwater Science Projects (Graduate Diploma) 2
Semester offered: Spring (offered in Autumn only if all other subjects have been completed)
Offered at: City campus

This subject is the same as 66021 Groundwater Science Projects (M) (FT), and 66046 and 66047 Groundwater Science Projects (M) Part A and Part B (PT), but at a reduced scale.

[1] 66048 Groundwater Science Projects (GD) Part A (PT) and 66049 Groundwater Science Projects (GD) Part B (PT) replace 66024 Groundwater Science Projects (GD) (PT).

66101

Earth Science 1

6cp
Semester offered: Autumn
Offered at: City campus

This is an entry level subject to the study of Earth Science concepts that introduces students to the basics necessary for geo-scientific and environmental studies. The dynamic earth and its materials; the structure and evolution of the crust, continents, oceans and the atmosphere. Geological history – what the rock sequences are telling us; time sequencing of major events which shaped our planet; the development of life forms and geological controls on these; structural geology. Introduction to landscape development – fluvial and arid, the coastal zone; geological hazards; groundwater; engineering geology; resources and mining; environmental geology. Weekly practical classes cover a wide range of skills in map reading, examination and description of sediments, minerals, rocks and fossils; geological interpretation. These are complemented by two full-day field excursions and other self-paced field work.

66204

Field Studies 1[1]

6cp; approximately 3–4hpw for 10 weeks, six-day field excursion in NSW, and up to four local half-day excursions; prerequisite(s): 66101 Earth Science 1
Semester offered: Spring
Offered at: City campus

An introduction to field techniques in the earth and environmental sciences. Introduction to air photographs and satellite imagery; use of these and topographic and other maps in the field. Concepts of land tenure, ethics and safety in the field. Methods of systematic study – gridding, transects, maps and plans on the local scale. Basic geological mapping, stratigraphic principles, examination of landscape changes with time. As appropriate, use and development of thematic and soils maps. Much of the subject is taught during one major field camp and supported by one or more afternoons of local field work.

[1] May not be offered in 2003.

66304

Earth Materials[1]

6cp; prerequisite(s): 33101 Mathematics 1 (Life Sciences) or equivalent, 65012 Chemistry 1A, 66101 Earth Science 1
Semester offered: Autumn
Offered at: City campus

Students are introduced to the rocks and minerals that are found at or near the surface of the Earth. The subject covers the techniques and methodologies used to identify and classify minerals and rocks in hand specimen and thin section. An introduction to the chemistry of minerals and rocks is also undertaken. Crystal symmetry and Miller Indices; optical theory; use of the polarising microscope; optical properties, chemistry and paragenesis of rock-forming minerals; crystallisation paths of igneous minerals; occurrence, mineralogy and texture of igneous rocks; introduction to nature of magma and its cooling behaviour, magmatic differentiation, sources of magma; igneous rock associations. Types of metamorphism and textures of metamorphic rocks; chemical equilibria and metamorphic mineral reactions; concept of metamorphic zones and facies; metamorphic rock associations. Macroscopic (hand specimen) and microscopic description of minerals and rocks.

[1] May not be offered in 2003.

66305

Fold Belts and Cratons[1]

6cp; prerequisite(s): 66101 Earth Science 1
Semester offered: subject to demand
Offered at: City campus

Stress and strain in rocks. Classification of common geological structures including folds, faults, joints, and foliations. Assemblages of imposed structures at different crustal levels. Deformation in space and time. Present day deformation and its relationship to plate boundaries. Relationship between metamorphism, the emplacement of large plutonic masses and plate setting. Presentation, manipulation and interpretation of structural data on maps, cross-sections and stereo nets. Use of the Mohr circle.

[1] May not be offered in 2003.

66408

Earth Resources[1]

6cp; prerequisite(s): 66304 Earth Materials; corequisite(s): 66409 Surficial Processes and Products
Semester offered: subject to demand
Offered at: City, St Leonards campuses

Introduction to the nature of ore bodies including genesis and classification. Laboratory investigation of ore deposits. Introduction to exploration methods and reserve estimation for mineral deposits. World energy market, geology of fossil fuels deposits including coal and associated strata, oil, natural gas and synfuels derived from oil shale, tar sands and other petroliferos sediments. Concepts of exploration and resource estimation. Alternate energy sources and their viability.

[1] May not be offered in 2003.

66409

Surficial Processes and Products[1]

6cp; prerequisite(s): 66204 Field Studies 1, 66304 Earth Materials, 65012 Chemistry 1A, 91311 Biology 1[2], 91101 Cells, Genetics and Evolution
Semester offered: subject to demand
Offered at: St Leonards campus

Formation of soil and its characteristics. Soil classification and distribution in Australia. Biota of Australian soils and their role in the ecosystem function. Plant soil interactions. Soil function in ecosystem determination and structure. Fundamentals of sedimentary materials and their classification. Hydrodynamics and the processes of sediment transport and deposition. Sediments as substrates: sediment/biota interactions and their function in palaeoecological reconstructions. Process/response sedimentary models and the sedimentology of the principal depositional environments including fluvial, marginal and marine systems.

[1] May not be offered in 2003.

[2] This subject is no longer offered.

66508

Crustal and Mantle Processes[1]

6cp; prerequisite(s): 66304 Earth Materials, 66305 Fold Belts and Cratons
Semester offered: Autumn
Offered at: City campus

Mantle-crust interactions as expressed by igneous activity at ocean ridges, intraplate settings and subduction zones. High pressure metamorphic processes and products at convergent margins. Crustal processes responsible for the formation of metamorphic rocks. Basic concepts of thermodynamics and experimental geology are introduced during the subject. A significant part of the assessment involves completion of an individual project which aims to develop investigation skills and the use of analytical equipment.

[1] May not be offered in 2003.

66509

Tectonics and Surface Dynamics[1]

6cp; 4hpw lectures/tutorials, 2hpw flexible; prerequisite(s): 66101 Earth Science 1
Semester offered: subject to demand
Offered at: City campus

Development of ideas leading to the present understanding of dynamic systems controlling evolution of the lithosphere. Modern tectonic elements and their distribution in relation to present-day plate boundaries. Identification of plate boundary assemblages and other tectonic elements in ancient fold belts. Terrane analysis. Supercontinents and their dispersion. Island arcs, cordilleran orogens and intracontinental mountain belts. Tectonic development of Australia and its surrounding oceans. Interactions between tectonics and climate, ocean dynamics, plant and animal biogeography and erosion.

[1] May not be offered in 2003.

66510

Geophysics[1]

6cp; prerequisite(s): 68041 Physical Aspects of Nature, 66101 Earth Science 1, 66408 Earth Resources
Semester offered: subject to demand
Offered at: City, St Leonard campuses

Review of solid earth geophysics including seismicity, magnetism, gravity and heat flow. Geophysical techniques applied to subsurface investigation of engineering, environmental and exploration sites, including resistivity, gravity, magnetics and seismic refraction and reflection techniques. Down-hole geophysics. Two-day field excursion.

[1] May not be offered in 2003.

66609

Environmental and Quaternary Geology[1]

6cp; prerequisite(s): 66409 Surficial Processes and Products
Semester offered: Subject to demand
Offered at: St Leonards campus

Quaternary allocyclic factors that influence earth systems and their consequences. Milankovich cycles, ice ages, eustatic fluctuations and climate change; recordings of these in Earth systems, their resulting elucidation, and the consequences of these and other major influences on the geosphere-biosphere. 'Greenhouse' concepts and their relationship and responses to natural and anthropogenic input. Geological hazards and their recognition, management and alleviation. Pollution and anthropogenic interference with earth systems and the problems that arise. Recognition of the environmental problems and methods for their control and alleviation.

[1] May not be offered in 2003.

66611

Engineering and Groundwater Geology[1]

6cp; includes several full and half-day excursions and field project work in the Sydney Basin; prerequisite(s): 66101 Earth Science 1, 33101 Mathematics 1 (Life Sciences), 65012 Chemistry 1A or equivalent, 66409 Surficial Processes and Products; corequisite(s): 66409 Surficial Processes and Products
Semester offered: Subject to demand
Offered at: St Leonards campus

Chemical weathering and clay mineralogy. Rheological properties of rocks and soils, properties of fills and aggregates; unified soil classification system. Engineering rock mass concepts and classification. Engineering site investigations, aspects of testing rocks and soils. Soil and rock slope stability; concepts of urban development, special purpose investigations, e.g. dams and tunnels. Basic concepts of hydrogeology; effective porosity, hydraulic conductivity of geologic materials, occurrence and flow of water in aquifers and soils, Darcy's Law, regional groundwater systems. The unsaturated zone. Elements of aqueous geochemistry and groundwater sampling. Water wells, construction of piezometers. This subject replaces 66501 Engineering and Environmental Geology, 66061 Environmental Geology, 66034 Groundwater Geology and 66610 Engineering Geology. Students who have completed any of these should not enrol in Engineering and Groundwater Geology.

[1] May not be offered in 2003.

66612

Geological Mapping

6cp; 10-day field excursion; prerequisite(s): 66204 Field Studies 1
Semester offered: subject to demand
Offered at: St Leonards campus

Regional and detailed geological mapping in a range of settings using topographic, air photo and plan bases. Recording field observations. Field techniques in stratigraphy and structural geology. Traversing. Location determination by visual, compass, altimeter and GPS methods. Use of information from remote sensing and geophysical aerial surveys. Report preparation and data compilation. Presentation of geological maps and sections. Land tenure and interaction with landowners and other interested parties. Safety in the field.

66651

Convergent Margin Tectonics

3cp; flexible including a four-day field excursion; prerequisite(s): 66509 Tectonics and Surface Dynamics
SUCOGG Elective
Subject Coordinator: Dr Paul Lennox (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

Students are expected to develop an understanding of modern convergent margins and the manifestation of their ancient equivalent preserved in orogenic belts. The subject covers basic tectonic elements, temporal and spatial variability of modern margins. The regional geology of the New England Fold Belt or the

Lachlan Fold Belt, two of the major tectonic elements of the Tasman Fold Belt System of Australia, are covered in detail as examples of ancient margins. The module provides a synthesis of data derived from many geological sub-disciplines and allows students to bring information together from many of their previous subjects in order to develop an overall view of the development of a large section of continental crust.

66653

Advanced Clastic Basin Analysis

3cp; flexible
SUCOGG Elective
Subject Coordinator: Associate Professor G Skilbeck
Semester offered: subject to demand
Offered at: subject to demand

A review of the principles of seismic and sequence stratigraphy, including the problems and pitfalls. An examination of clastic sedimentary environments with particular emphasis on sandstone body deposition and orientation within a sequence stratigraphy framework. Applications of genetic/sequence stratigraphy are examined in exercises using real seismic and well data. On the accompanying field trip, outcrop of fluvial, near-shore, shallow and deep marine environments are examined to demonstrate the three-dimensional nature of deposits.

email Greg.Skilbeck@uts.edu.au

66856

Honours (Geoscience) 1

24cp; prerequisite(s): BSc in Earth and Environmental Science or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

Study in this subject is designed to enhance skills and knowledge in undertaking scientific research in geology. The subject comprises 12 credit points of electives in a specialist field and a 36-credit-point equivalent individual research project where the student, under supervision, defines a problem in an area of interest, and then collects, analyses and interprets data to solve this problem. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, and critically assess information and to develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis which comprises the main assessment component. Research ethics and scientific method are emphasised.

66857

Honours (Geoscience) 2

24cp; prerequisite(s): 66856 Honours (Geoscience) 1
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

Study in this subject is designed to enhance skills and knowledge in undertaking scientific research in geology. The subject comprises 12 credit points of electives in a specialist field and a 36-credit-point equivalent individual research project where the student, under supervision, defines a problem in an area of interest, and then collects, analyses and interprets data to solve this problem. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, and critically assess information and to develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis which comprises the main assessment component. Research ethics and scientific method are emphasised.

66941

Applied Palaeontology

3cp; flexible
SUCOGG Elective
Subject Coordinator: Associate Professor R Mawson (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

This is an introduction to applied methods of dealing with a selection of stratigraphically important fossil groups. The subject aims to give students an awareness of what can be gleaned from the fossils they might find in their field area and to enhance students' skills in practical palaeontological methods. The subject includes practical experience in problem solving involving at least six stratigraphically important groups of fossils.

email rmawson@laurel.ocs.mq.edu.au

66942

Palaeobiology Part I

3cp; flexible
SUCOGG Elective
Subject Coordinator: Associate Professor R Mawson (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

In this subject, students are able to extend their awareness of the problems concerning invertebrate fossil communities. Students gain an awareness of the importance of form and structure of fossil invertebrates and enhance their skills in critical evaluation. Of particular importance is the study of evolutionary palaeontology with features such as shell form, musculature, vision, and buoyancy of extinct invertebrates; coloniality and models of phylogeny.

email rmawson@laurel.ocs.mq.edu.au

Other staff involved:

Professor J Talent (Macquarie University)

66943

Coastal Environmental Assessments

3cp; flexible
SUCOGG Elective
Subject Coordinator: Associate Professor A D Albani (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

Students learn how to carry out a coastal environmental assessment of a target area. The subject deals specifically with the coastal fringe, which is under ever increasing pressure from urbanisation and industrialisation. Students gain an understanding of the relationship between benthic foraminifera, sediments, sediment geochemistry and the water masses. The construction and testing of databases, including the use of complex numeric databases to evaluate human impact on the coastal environments, are included. Sampling analytical techniques, including statistical analyses of the databases are presented through the use of case studies.

email a.albani@unsw.edu.au

Other staff involved:

Dr P C Rickwood (UNSW)

66944

Coal and Organic Petrology

3cp; flexible
SUCOGG Elective
Subject Coordinator: Associate Professor C Ward (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to develop familiarity with the techniques of coal deposit evaluation, and the use of geology in coal mining operations. Topics covered include geological evaluation of coal deposits, the relation between quality factors and coal preparation, marketing and use; geological and geophysical methods in coal exploration programs; significance of geological features in the design, development and operation of underground and open-cut coal mines, and the evaluation of environmental impacts of coal mining. A combination of the following topics is covered: coal analysis and testing programs; coal petrology and petrographic analysis; relationship of coal properties to utilisation processes; introduction to mining methods and coal preparation technology; geological and geophysical methods for coal exploration and mine-site studies; mechanical behaviour of rock masses in surface and underground mine situations; subsidence and environmental impact evaluation; and introduction to geological database and modelling systems.

email C.Ward@unsw.edu.au

66949

Palaeobiology Part II

3cp; flexible; prerequisite(s): 66942 Palaeobiology Part I
SUCOGG Elective
Subject Coordinator: Associate Professor R Mawson (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

In this subject students extend their knowledge of problems concerning vertebrates, with emphasis on the development of critical skills in the evolutionary palaeontology and the science of form in vertebrates. Special emphasis is given to palaeoengineering (including jaw mechanics, flight, etc.) and approaches to physiology and sociobiology of extinct vertebrates and the evolution of the brain.

email rmawson@laurel.ocs.mq.edu.au

Other staff involved:

Professor J Talent (Macquarie University)

66950

Geochemical Analysis Techniques and Applications

3cp; flexible
SUCOGG Elective
Subject Coordinator: Dr N J Pearson (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

The aim of this subject is to familiarise students with the various analytical techniques used in geochemical analysis, concentrating on the facilities available to SUCOGG. Students develop a basic working knowledge of the principles and procedures used in the evaluation and manipulation of geochemical data and have the opportunity to gain practical experience in the application of geochemical data to a diverse range of petrological problems. The subject is relevant to students planning a career in petrology because advances in instrumentation and the development of new techniques are producing an abundance of geochemical data and an understanding of these analytical techniques is necessary to remove the 'black-box' aura and to create a greater appreciation of the quality of the results. This is critical to the interpretation of geochemical data, and the significance attained when propagated in petrogenetic models.

The program includes a review of analytical techniques (XRF, electron microprobe, mass spectrometry, laser Raman spectroscopy, XRD, proton microprobe, ICP-MS, high P-T experimental apparatus), planning of an analytical program, sample preparation, basic X-ray theory, errors and analysis statistics, fundamental data manipulation (calculation of structural formulae, mineral end-members, CIPW norm), data presentation, introduction to advanced geochemical software.

email norm.pearson@mq.edu.au

Other staff involved:

Professor S Y O'Reilly

Professor T H Green (Macquarie University)
Professor W L Griffin (CSIRO)

66952

Introduction to Phase Diagrams and Thermobarometry

3cp; flexible
SUCOGG Elective
Subject Coordinator: Dr G Clarke (Sydney University)
Semester offered: subject to demand
Offered at: subject to demand

In this subject students learn how whole rock and mineral geochemical data may be used to quantitatively constrain the P-T-X conditions that formed some common metamorphic rocks, and the application of phase diagrams to common metamorphic problems. Topics such as elementary thermodynamic theory, use of data that has already been acquired through electron microprobe analysis of rock thin sections, and the principles of Schreinemakers analysis are covered. At the end of the subject students should have sufficient knowledge of, and confidence in, thermobarometric and phase diagram methods to: (i) competently analyse a given metamorphic rock; (ii) describe the minerals present in terms of their composition and potential end-members; (iii) apply common, experimentally calibrated thermometers and barometers; and (iv) construct simple phase diagrams that complement quantitative methods of analysis. Since the conditions of formation of many common mineral assemblages may not be precisely defined, a thermobarometric method that uses an approach involving an internally consistent thermodynamic data set is also introduced and applied.

email geoffc@mail.usyd.edu.au

Other staff involved:

Associate Professor B Hensen

66953

Interpretation of 2D and 3D Seismic Reflection Data

3cp; flexible
SUCOGG Elective
Subject Coordinator: Mr D Palmer (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

In this subject students develop skills and knowledge about the interpretation of seismic reflection data for petroleum exploration and coal mine planning, using interactive computer software (SeisVision by GeoGraphix). The program includes introductory seismic data processing, spatial and temporal resolution, 3D Migration, the design of 3D surveys, display of the 3D seismic data volume, vertical and horizontal sections, attributes, phase, and colour, structural interpretation, horizon picking, fault mapping, depth conversion, stratigraphic interpretation, horizontal time sections, horizon flattening, and reservoir analysis.

email d.palmer@unsw.edu.au

Other staff involved:

Associate Professor C G Skilbeck (UTS)

66954

Processing of Seismic Reflection and Ground Penetrating Radar Data

3cp; flexible
SUCOGG Elective
Subject Coordinator: Mr D Palmer (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

The subject develops familiarity and skills in routine processing of time series data recorded for seismic reflection and ground penetrating radar surveys. Topics include: a review of fundamental theory, analogue and digital signals, aliasing, the Fourier transform, bandwidth, the impulse response, convolution, correlation, introduction to seismic unix, general command structure, self documentation, examining trace headers, displaying with SU, spectral analysis with SU, frequency filtering with SU, velocity filtering with SU, common midpoint sorting, velocity analysis, normal move-out corrections, stacking, migration.

email d.palmer@unsw.edu.au

Other staff involved:
Professor I Mason (Sydney University)
Dr K Gohl (Macquarie University)

66955

Geological and Structural Interpretation of Potential Field Data

3cp; flexible
SUCOGG Elective
Subject Coordinator: Dr M Lackie (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

The subject develops familiarity and skills in the geological interpretation of aeromagnetic, radiometric and gravity data. Topics dealt with in the subject include a review of fundamentals of petrophysics, sampling, resolution, and spatial aliasing, image presentation, high and low pass filters, the geometric skeleton, definition of discrete magnetic units, definition of discontinuities and contacts, separation of shallow and deep sources, dip indicators, geological classification of aeromagnetic patterns, the third dimension, structural history and modelling with 'Noddy'.

email mlackie@laurel.ocs.mq.edu.au

Other staff involved:
Dr P G Lennox (UNSW)
Mr D Palmer (UNSW)

66956

Deformation Processes

3cp; flexible
SUCOGG Elective
Subject Coordinator: Dr D W Durney (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

This subject gives an overview of mechanisms of deformation and mass-transfer which affect common rock types (structural petrology) and simple concepts of progressive deformation (kinematics). Examples are mainly from low-grade metamorphic environments, but many of the concepts apply to higher grades as well. Expected outcomes include being able to analyse and report microstructures associated with tectonic deformation and veining in silicate and carbonate rocks, and to gain an appreciation of flow types and how structures may develop through time. The subject is relevant to field or laboratory studies of deformed rocks (including orebody host-rocks) wherever cleavage, veining, metasomatism, shearing or multiple deformation are present. The subject covers topics such as intracrystalline (dislocation) and intercrystalline (solution-transfer) deformation mechanisms and mass transfer processes; deformation mechanism microstructures and controls. Mineral growth textures and their modification; types of vein growth. Practical work includes an examination of neocrystallisation textures and cleavage structures.

email ddurney@atlas.es.mq.edu.au

66957

Introduction to Geostatistical Data Analysis

3cp; flexible
SUCOGG Elective
Subject Coordinator: Dr R Dietmar Mueller (Sydney University)
Semester offered: subject to demand
Offered at: subject to demand

Basic principles of statistical data analysis in geoscience; data collection and preparation, univariate statistics including graphical and numerical description, probability, the normal distribution, inference, analysis of variance multivariate statistics including bivariate scatter, correlation coefficient and bivariate regression with special emphasis on geo-scientific applications.

email dietmar@es.su.oz.au

66958

Desktop Geological Mapping

3cp; flexible, intensive three-day short course
SUCOGG elective
Subject Coordinator: Associate Professor Geoff Taylor (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

This subject is designed to equip students to import data from various sources and to use this data to create outcrop and interpretive geological maps. For further information, consult the Course Director.

email g.taylor@unsw.edu.au

66959

Geophysical Data Processing and Plotting using GMT

3cp; flexible
SUCOGG elective
Subject Coordinator: Dr Carmen Gaina (University of Sydney)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to familiarise students with GMT computer program set, UNIX general processing tools and basic shell programming in order to plot and process geophysical data. For further information, consult the Course Director.

email Greg.Skilbeck@uts.edu.au

66960

Image Processing of Geophysical and Remotely-sensed Data with ER Mapper

3cp; flexible, intensive three-day short course
SUCOGG elective
Subject Coordinator: Associate Professor Geoff Taylor (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to equip students to be able to import, enhance, integrate and export to a GIS various kinds of geophysical and remotely sensed data. For further information, consult the Course Director.

email g.taylor@unsw.edu.au

66961

Interpretation of (Multivariate) Geological Data

3cp; flexible, intensive four-day short course
SUCOGG elective
Subject Coordinator: Dr David Cohen (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to familiarise students with a range of multivariate data processing methods designed to reveal patterns of correlation between variables or associations between samples, and isolate anomalous observations. Methods are commonly applied in geology, geochemistry and geophysics. For further information, consult the Course Director.

email d.cohen@unsw.edu.au

66962

Analysis of Natural Materials

3cp; flexible
SUCOGG elective
Subject Coordinator: Dr D R Cohen (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to provide students with practical experience in the use of common physical and chemical analytical procedures, as well as sampling and sample processing procedures and data quality control techniques. This subject is of particular interest to potential environmental scientists or exploration geologists. For further information, consult the Course Director.

email d.cohen@unsw.edu.au

66963

Coral Reef Dynamics

3cp; flexible, one-day preparation and nine-day field trip to Heron Island
SUCOGG elective: Subject Coordinator: Associate Professor Ruth Mawson (Macquarie University)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to provide students with practical experience in a coral reef environment in order to study the dynamics of a living reef and applying the principles to the past. Note there are additional costs associated with travel to and from Heron Island and the field trip. For further information, consult the Course Director.

rmawson@laurel.ocs.mq.edu.au

66964

Interpretation of Seismic Refraction Data

3cp; flexible
SUCOGG elective
Subject Coordinator: Mr Derecke Palmer (UNSW)
Semester offered: subject to demand
Offered at: subject to demand

This subject aims to develop intermediate to advanced skills in the interpretation of seismic refraction data for geotechnical, groundwater, environmental and statistical applications. For further information, consult the Course Director.

email d.palmer@unsw.edu.au

67101

Introduction to Materials

6cp; corequisite(s): 65101 Chemistry 1C or equivalent
Semester offered: Autumn, Spring
Offered at: City campus

This is an introduction to materials science, providing a foundation in microscopic structure and composition for the understanding of the behaviour of engineering materials. Topics include classification and structure of solids, phase diagrams, properties of metals, ceramics, polymers, timber and composites.

67303

Mechanical Properties of Materials

6cp; prerequisite(s): 33190 Mathematical Modelling for Science, 67101 Introduction to Materials
Semester offered: Spring
Offered at: City campus

This subject provides an understanding of the mechanical properties of materials by the use of standard mechanical tests and the determination of materials property data. The concepts of stress, strain, elasticity, plasticity and criteria for yielding and fracture are addressed and applied to a wide range of mechanical test methods and materials. The issue of fractography as a means failure analysis is also addressed. Basic statics is introduced to the student along with an introduction to fracture mechanics. This subject also ensures that the student develops the necessary laboratory and analysis skills required by professionals involved in the mechanical testing of materials for either research or quality assurance.

67304

Physical Metallurgy[1]

6cp; 6hpw; prerequisite(s): 67303 Mechanical Properties of Materials, 67101 Introduction to Materials
Semester offered: Autumn
Offered at: City campus

This subject provides an understanding of the theory of phase transformations in metal and alloys. Solidification and solid–solid transformations of metals and alloys are studied in relevance to the phase transformation theory. Deformation mechanism and annealing behaviour of metals and alloys are studied in terms of modern theory and practice. Attention is also given to application of the industrial processes and their effects on the micro-structure–texture–property development of metallic materials.

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1 This subject may not be offered every year.

67305

Polymer Science

6cp; 6hpw; prerequisite(s): 65201 Chemistry 2C, 67101 Introduction to Materials or equivalent
Semester offered: Autumn
Offered at: City campus

This subject provides an introduction to the chemistry and physics of polymers and includes comprehensive coverage of the structures, polymerisation mechanisms and characterisation techniques of polymers. Practical classes provide experience with relevant techniques and complement the theory presented in lectures. The applications of polymers are also addressed. This subject gives students a solid grounding in the field of polymers and the practical foundation for work in the polymer industry.

67306

Industrial Ceramics

6cp; 6hpw; prerequisite(s): 67101 Introduction to Materials, 65201 Chemistry 2C
Semester offered: Autumn
Offered at: City campus

Fundamentals of ceramic science and technology, ceramic phase diagrams – binary and ternary systems, ceramic structures and phase transformation, clay-based ceramics, cements and concretes, and glasses. Raw materials and manufacturing methods.

67407

Physical Properties of Materials

6cp; 6hpw; prerequisite(s): 67101 Introduction to Materials, 68201 Physics in Action (Physics 2), 33190 Mathematical Modelling for Science, 65201 Chemistry 2C
Semester offered: usually Spring
Offered at: City campus

An introduction to atomic structure and quantum mechanics serves to develop the band theory of solids at an intermediate level. These theoretical concepts are utilised in describing the electrical, thermal, magnetic and optical properties of metals, semiconductors and insulators. The characteristics and structure of high temperature superconductors are discussed. The unique properties of these materials are emphasised by an examination of devices including capacitors, diodes, thermocouples, loudspeakers, recording heads, strain gauges, information storage, fibre optics and so on.

67408

Industrial Metallurgy[1]

6cp; 6hpw; prerequisite(s): 67303 Mechanical Properties of Materials, 67304 Physical Metallurgy
Semester offered: Spring
Offered at: City campus

The subject provides an understanding of application of metallurgical principles and theoretical concepts to the present and developing metal processing technologies, including foundry and casting technology, metalworking processes, welding technology, surface finishing and powder metallurgical techniques. The theory and application of non-destructive testing techniques are studied for examination of metal components and structures. Attention is also given to the environmental impact and the latest recycling technology of metals and alloys.

[1] This subject may not be offered every year.

67409

Polymer Technology[1]

6cp; 6hpw; prerequisite(s): 67303 Mechanical Properties of Materials, 67304 Physical Metallurgy
Semester offered: Spring
Offered at: City campus

This subject provides a comprehensive coverage of the physical properties of polymers and processing methods used in their manufacture. Practical classes provide experience with such processing methods and the relevant mechanical testing techniques. This subject gives students a practical foundation for work in the polymer industry.

[1] This subject may not be offered every year.

67506

Technical Ceramics[1]

6cp; 6hpw; prerequisite(s): 67306 Industrial Ceramics, 67303 Mechanical Properties of Materials
Semester offered: Spring
Offered at: City campus

This subject covers the physical aspects of the Technical Ceramics. Structural imperfections are covered using Kroger–Vink notations and industrial electronic ceramics are introduced as practical examples. Free energy curves for ceramic materials are covered and spinel diagrams and related ferrite and aluminate structures are introduced. Diffusion, densification, sintering theories, grain growth and other sintering problems. Molecular engineering of advanced ceramics, oxides, nitrides, sialons in general. Advanced ceramics production methods. Glass ceramics, thermal coatings, mechanical properties, reliability and probability analysis in ceramic materials. Toughening mechanisms in ceramics. Magnetic and electronic and opto-electronic ceramics. Optical fibre production and technology.

[1] This subject may not be offered every year.

67508

Surface Chemistry of Materials

6cp; 5hpw; prerequisite(s): completion of up to and including Stage 3 of the Applied Chemistry degree course
Semester offered: Autumn
Offered at: City campus

This subject contains a detailed treatment of basic surface chemical concepts, techniques and applications of liquid and solid systems. Equilibrium thermodynamics is used to define surface energies. Adsorption/desorption phenomena are described by kinetic modelling techniques as well as by the unique properties in solution and their absorption characteristics. The control of the electrical nature of solid surfaces is examined and applied to the stability of colloidal systems. Much of the fundamental phenomena covered in the subject is applied to the understanding of adhesion of coatings and adhesives.

67606

Corrosion and Degradation of Materials

6cp; 6hpw; prerequisite(s): 67408 Industrial Metallurgy, 67506 Technical Ceramics, 67409 Polymer Technology
Semester offered: n/a
Offered at: n/a

This subject provides a detailed survey of the forms and mechanisms of corrosion of metallic materials and the degradation of non-metallic materials. The use of appropriate non-corrosion and anti-degradation methods is considered in terms of modern theory and practice. Attention is also given to the economics of materials selection and degradation protection and control techniques. Lectures are complimented by an extensive practical program which emphasises the applied nature of the subject.

67608

Composites[1]

6cp; 4hpw; prerequisite(s): 67303 Mechanical Properties of Materials, 67409 Polymer Technology, 67506 Technical Ceramics, 67408 Industrial Metallurgy
Semester offered: Spring
Offered at: City campus

The subject draws together the concepts the students have developed on metals, ceramics and polymers and applies them to the incorporation of these materials to form composites in order to develop material properties that are unobtainable in the monolithic counterparts. Students learn to understand why composites are used and what advantages they can give the designer/engineer over monolithic materials. Students gain a basic knowledge of composite design and cost analysis in the use of composites. In addition students obtain an understanding of the processing methods used to produce composite parts. Also included is an examination of the decision-making processes that materials scientists employ to originate, evolve and produce a device. Material selection and specification is examined and is not limited to composite materials.

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1 This subject may not be offered every year.

67861

Honours (Materials Science) 1

24cp; prerequisite(s): BSc in Materials Science or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: City campus

Study in the subjects is designed to increase skills and knowledge necessary for research in materials science. The student selects an individual research project and under supervision, formulates a research plan for a problem in an area of interest. Planning is based upon a critical review of the technical literature and methodologies. Appropriate goals are set within definite time frames and resources to ensure the objectives are fulfilled. Students gain practical experience in applying advanced analytical methods through sophisticated instrumentation to characterise the structural aspects and properties of the material under investigation. Data collected from these measurements are evaluated by testing the statistical significance and establishing empirical relationships between experimental variables. Interpretation of the data and the establishment of models from accepted modern theories to explain the empirical findings enhance the creative skills of the student. The findings of the research project are presented in a structured and integrated thesis which comprises the main assessment. In addition, two hours per week are devoted to advanced topics of current research interest, presented through specialist lectures or seminars.

67862

Honours (Materials Science) 2

24cp; prerequisite(s): BSc in Materials Science or equivalent three-year degree; 67861 Honours (Materials Science) 1
Semester offered: Autumn, Spring
Offered at: City campus

For subject description, refer to 67861 Honours (Materials Science) 1.

68041

Physical Aspects of Nature

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

This subject provides a general introduction to movement, wave motion, optics, thermal effects, properties of solid and fluid matter, electrical and atomic concepts with a view to developing an appreciation and understanding of how to model the physical aspects of nature. The material is presented with a focus on application to all areas of science and life science and integrates as a key component hands-on laboratory work and analysis of experimental data.

68101

Foundations of Physics

6cp; 6hpw
Semester offered: Autumn, Spring
Offered at: City campus

This is a foundation physics subject primarily for students in the physical sciences. It covers the fundamentals of dynamics and statics, fluid mechanics, thermal physics, waves and electricity. A strong emphasis is placed on the investigative nature of physics research with an integrated laboratory program developing further the problem-solving skills of the lecture and tutorial material to an appreciation of good experimental design and significance in information obtained under real-life modelling situations.

68201

Physics in Action (Physics 2)

6cp; 6hpw; prerequisite(s): 68101 Foundations of Physics
Semester offered: Spring
Offered at: City campus

This subject extends the material studied in 68101 Foundations in Physics, with statics and dynamics extended to a study of rotation, thermal physics extended to the first two laws of the thermodynamics, and waves extended to a study of geometrical optics and optical devices. At the same time, students are introduced to electric circuitry and electromagnetism and commence a historical study of atomic and nuclear physics.

68311

Atoms, Photons and Orbits (Physics 3)[1]

6cp; 5hpw; prerequisite(s): 33190 Mathematical Modelling for Science or equivalent, 68201 Physics in Action (Physics 2); corequisite(s): 33290 Computing and Mathematics for Science
Semester offered: subject to demand
Offered at: City campus

First-year mathematical techniques enable students in this subject to extend the understanding and modelling of mechanics and optics to more real-world situations and at the same time explores the exciting evolution from Newtonian Physics to Quantum Physics. It provides the foundation for later core physics subjects, the emphasis of the subject being mainly theoretical, but it has an experimental component applying the explorative first year techniques to optical experimentation, a study of radioactivity and computer simulation of dynamical systems.

Mechanics topics include the generalisation of kinematics to 3D motion and orbital mechanics. Optics studies include refraction, lenses, photography, the dispersion of light, aberrations, polarisation and scattering phenomena. 'Modern' physics studies the basic properties of the atom, radioactivity and relativity and lead into an introductory segment on Quantum Physics.

[1] Not offered in 2003.

68312

Electrotechnology and Data Analysis

6cp; 5hpw; prerequisite(s): 68201 Physics in Action (Physics 2), 33290 Computing and Mathematics for Science
Semester offered: Spring
Offered at: City campus

Scientific writing, rigorous analysis and a command of methods of presentation are essential tools for the physicist of the 21st century. In this subject, students study the concepts of electricity, electromagnetism and electrical measurements and their application to dynamical systems, and at the same time explore contemporary techniques of analysis of experimental data. These two areas are integrated into a project component which develops further the skills of experimental design developed in 68101 Foundations of Physics in an electromagnetic context, and enables the students to become critical analysers of their own and others' experimental work.

68314

Electronics

6cp; 5hpw; prerequisite(s): 68201 Physics in Action (Physics 2), 33290 Computing and Mathematics for Science
Semester offered: Autumn
Offered at: City campus

This subject develops students' understanding of the basic building blocks of electronic circuits. Review of circuit theory, semiconductor theory, diodes and bipolar transistors, transistors as switches and linear devices, introduction to digital electronics, logic gates, latches and counters, frequency characteristics and feedback in amplifiers, operational amplifiers. Hands on learning, guided discovery activities in laboratory context are a key feature. The subject is equivalent to the Engineering subject 48520 Electronics.

68411

Vibrations, Quanta and Nucleons (Physics 4)

6cp; 5hpw plus 1hr flexible; prerequisite(s): 68201 Physics in Action (Physics 2); 33290 Computing and Mathematics for Science
Semester offered: Spring
Offered at: City campus

This subject aims to complete the basic core physics training for Applied Physics students by applying the treatment of mechanics to vibrations, variable mass and fluid flow and to the special features of the mechanics of the atom. Students learn the basic techniques of quantum mechanics to begin to understand the findings of atomic theory introduced in 68311 Atoms, Photons and Orbits (Physics 3). Processes involving the considerable forces associated with the inner structure of the nucleus are studied to provide an understanding of the power of nuclear applications in the fields of medicine and forensic science. This is core material, providing the foundation for a study of the solid-state and leads directly into the subject 68511 Quantum and Solid-state Physics.

68412

Energy Science and Technology[1]

6cp; 5hpw; prerequisite(s): 68201 Physics in Action (Physics 2), 33290 Computing and Mathematics for Science or equivalent
Semester offered: subject to demand
Offered at: City campus

Solar, renewable and conventual energy issues including energy efficiency and the possibilities for energy use posed by the laws of thermodynamics. Vacuum and thin films play a key role in many energy technologies – this part of the course is laboratory and project-based, including a practical study in either advanced windows, roof coatings or solar absorbers.

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1 Not offered in 2003.

68511

Quantum and Solid-state Physics

6cp; 5hpw; prerequisite(s): 68411 Vibrations, Quanta and Nucleons (Physics 4)
Semester offered: Autumn
Offered at: City campus

This subject highlights the fundamental nature of quantum mechanics and its application to the understanding of solids. Potential wells, eigenstates and eigenvalues, solutions to the Schrödinger equation in 3 dimensions, linear combination of atomic orbitals, band theory, pure and doped semiconductors, pn-junction and the light emitting diode are explored. A student does not have to be Einstein to understand the quantum mechanical basis of modern devices and their application in modern life. A major assignment is computational and utilises software skills developed in 33490 Computational Mathematics and Physics.

68512

Research Methods in Applied Physics

6cp; 5hpw; prerequisite(s): 68312 Electrotechnology and Data Analysis or equivalent experimental design experience
Semester offered: Autumn
Offered at: City campus

The purpose of this 'capstone' applied physics subject is to provide the opportunity for students to experience applied physics research. Students are able to develop skills in cutting edge research techniques. Exact topics covered vary depending on availability of staff. For example, X-ray diffraction, atomic force microscopy, scanning electron microscopy, solar energy materials, advanced optical characterisation, lighting, energy, medical imaging, and parallel computing could be offered. A few background lectures may take place though the subject is predominantly project and laboratory based. The subject is a suitable elective for students in all branches of the physical sciences.

68514
Electronics and Interfacing

6cp; 5hpw; prerequisite(s): 68314 Electronics, 48520 Electronics or equivalent instrumentation experience
Semester offered: Spring
Offered at: City campus

The subject further develops students' understanding of computer interfacing in applied physics and science in general. Students learn how to construct functioning interfaces and the role of digital electronics. Digital electronics, computer interfacing, and the use of the LabView package are the main components of the subject. A sequence of small projects involves the design and construction of circuits and interfaces and is a key feature of the subject. This subject is useful to students in science courses who have an interest in developing their skills in the instrumentation and interfacing areas, with project work oriented to students' needs and interests.

68611
Electromagnetics and Optics

6cp; 5hpw; prerequisite(s): 68201 Physics in Action (Physics 2), 33xxx Mathematics for Physical Science
Semester offered: Spring
Offered at: City campus

The subject's purpose is to consolidate the emphasis on optics and its applications in the course. The development of an understanding of electromagnetic theory and some of its key features, and its relevance to modern telecommunications benefits scientists and engineers. The subject seeks to consolidate students' understanding of the theory of electromagnetism in the modern world. The topics include derivation and application of Maxwell's equations, energy transfer by waves, guided waves and optical fibre technology, optical instrumentation, diffraction and spatial filtering techniques. The emphasis of this subject is conceptual. Students also engage in an extensive laboratory program in experimental optics. Computer simulation and data visualisation techniques underpin the electromagnetics theory. Students are encouraged to explore topics of interest through project activities.

68861
Honours (Physics) 1

24cp; prerequisite(s): BSc in Applied Physics or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: City campus

Study in these subjects is designed to enhance the skills and knowledge necessary for research in physics. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigations in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

68862
Honours (Physics) 2

24cp; prerequisite(s): BSc in Applied Physics or equivalent three-year degree; 68861 honours (Physics) 1
Semester offered: Autumn, Spring
Offered at: City campus

For subject description, refer to 68861 Honours (Physics) 1.

68xxx
Imaging Science

6cp; 5hpw: 68201 Physics in Action or equivalent
Semester offered: Autumn
Offered at: City campus

This subject is an introduction to how light can be used to observe the world from the molecular scale upwards. It discusses the electromagnetic description and the description based on photons. Different sources and detectors of light are considered. The design of imaging systems and their resolution limits are analysed. The subject includes a significant experimental component, which emphasises the importance of careful analysis of results and the need for a clear presentation of the findings of experimental investigations.

68xxx

Introduction to Computational Science

6cp; 4hpw; prerequisite(s): 35170 Introduction to Computing
Semester offered: Spring
Offered at: City campus

This subject introduces the key elements of Computational Science which has been described as the third way of doing science. Approaches such as cellular automata and Monte Carlo techniques and their applications to biology, the social sciences and the physical sciences are examined. Computer architecture, data structures and visualisation are also introduced.

68xxx

Quantum Technology

6cp; 5hpw; prerequisites: 33190 Mathematical Modelling for Science or equivalent; 68201 Physics in Action or 65201 Chemistry 2C or equivalent.
Semester offered: Spring
Offered at: City campus

This subject examines how the behaviour of the world at a microscopic scale differs from our everyday macroscopic experience. It introduces concepts to describe the behaviour of atoms, molecules and solids and the tools of quantum mechanics required to model this behaviour. The unique properties of matter at this scale can be exploited in nanotechnology to create materials and devices with unique properties. This subject explores emerging technologies such as quantum computing, quantum dots and wells, for example, and spectroscopic tools used to characterise and investigate the microscopic world. This subject provides material which is fundamental to understanding many areas of physics and chemistry together with contemporary applications which are relevant to nanotechnologists.

69311

Occupational Health and Safety in Society

3cp; 2hpw
Semester offered: Spring
Offered at: City campus

This subject covers the psychological, political and sociological dimensions of occupational health and safety, and presents them within the context of the overall social system. It highlights the complexity and diversity of working environments, and the importance of the human agency in constructing and changing them. It also explores the strategies available to create safer and healthier working situations.

69312

Occupational Hazard Analysis

6cp; 4hpw
Semester offered: Autumn
Offered at: City campus

This subject deals with the identification of the major categories of both safety and health hazards, the analytical techniques and management programs appropriate for dealing with them, and the development of policies in occupational health and safety models of accident and disease causation, techniques of investigation, emergency hazards and risk assessment.

69323

Human Factors/Ergonomic Design

3cp; 2hpw
Semester offered: Autumn
Offered at: City campus

The role of ergonomics/human factors in the creation of a healthy, safe and productive work environment is covered, including the principles and techniques used in this discipline. The subject includes the principles of ergonomic design and their application to product and equipment design to combine safety with functionality.

69325

Data Analysis in Occupational Health and Safety

3cp; 2hpw
Semester offered: Autumn
Offered at: City campus

The collection and organisation of data, and access to and use of databases are important aspects of the effective management of the occupational health and safety function. This subject develops understanding and proficiency in these areas with special reference to occupational health and safety and workers' compensation information systems and reference material databases.

69332

Chemical Safety (Management)

3cp; 2hpw
Semester offered: Spring
Offered at: City campus

This subject deals with the hazardous effects of chemicals on people and the methods of handling and storing chemicals to minimise risks to health and safety.

69335

People and the Physical Environment

3cp; 2hpw
Semester offered: Spring
Offered at: City campus

People have a continuing and dynamic interaction with their physical surroundings, and the processes of this interaction must be understood so that they can be designed for and controlled. The subject deals with both those interactions, which are a part of normal processes, such as noise, vibrations and heat, and those which are random and unplanned events. The first of these can be quantitatively assessed and controlled, whereas the latter requires the application of probability and reliability techniques.

69336

Evaluating Occupational Health and Safety (Construction Industry)

6cp; 4hpw; prerequisite(s): completion of two semesters of the Master of Occupational Health and Safety Management
Semester offered: Spring
Offered at: City campus

This subject focuses on the importance to the occupational health and safety manager of identifying and accessing occupational health and safety research literature sources in order to keep abreast of current issues and emerging technologies in the building construction industry. It is designed to encourage the development of skills in accessing and critically evaluating occupational health and safety research literature in its treatment of current issues in the building and construction industry as well as to develop skills and confidence in evaluating and communicating such information.

69337

Special Reading Subject

3cp
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

To be taken only following prior negotiation on the part of the student with a full-time member of academic staff regarding individual supervision. In addition, special permission of the Associate Dean (Teaching and Learning) is required.

69338

Biological Hazards and Toxicology

6cp; 4hpw
Semester offered: Autumn
Offered at: City campus

This is an introduction to biological hazards in the workplace, including allergens in air-conditioning systems, legionellosis, infecting disorders, food poisoning, and other job associated risks. It also discusses the principles of environmental and human toxicology, including toxic gases, dusts and chemicals and test methods, hygiene and sanitation.

69341

Risk Management

6cp; 4hpw
Semester offered: Spring
Offered at: City campus

Risk management is the term applied to a logical and systematic method of identifying, analysing, assessing, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organisations to minimise losses and maximise opportunities.

At successful completion of this subject students will have demonstrated that they:

- understand and are able to implement the Australian/New Zealand Standard 4360 in the context of occupational health and safety, and
- understand the systems associated with the application of risk management in organisations.

69342

Legal Aspects of Occupational Health and Safety

3cp; availability: MOHSM (Faculty of Science) Postgraduate
Semester offered: Spring
Offered at: City campus

Occupational health and safety is covered by a wide range of legislative acts and regulations, both State and federal. This subject introduces students to the important aspects of this legislation, its interpretation, and the implications for the organisation and management of the occupational health and safety function.

69345

Occupational Health and Safety Management

6cp; 4hpw
Semester offered: Spring
Offered at: City campus

This subject brings together the management aspects of occupational health and safety through group exercises and case studies. It includes examination of the behaviour of people in organisations, and the dynamics of interpersonal and intergroup behaviour. It then deals with the role of the occupational health and safety manager in industry, motivation for health and safety, industrial relations issues, current concepts in safety and health, data analysis and collection and the use of records, training for occupational health and safety, and economic aspects of losses associated with accidents, injuries and ill health.

69351

Occupational Health and Safety Project

12cp
Semester offered: Autumn, Spring
Offered at: City campus

Students are required to undertake a substantial research project in an area of specialisation in occupational health and safety, which is of interest and relevance to them. They are guided and supervised by a member of academic staff from that area. Students may also be required to undertake additional coursework in research methods and/or in the specialisation area to supplement the research program.

69353

Research Proposal (Occupational Health and Safety)

12cp; 6hpw (average) over two semesters; corequisite(s): 69351 Occupational Health and Safety Project
Semester offered: Autumn, Spring
Offered at: City campus

This subject complements 69351 Occupational Health and Safety Project. Each student works independently to review relevant research literature in order to develop a viable research question suitable for investigation in 69351. Students then formulate a specific research plan including selection of appropriate data collection and analysis methods and scheduling the sequence of steps that are required to answer the question within the available time frame. There is a formal lecture component dealing with research issues. Student seminars and written reports based on different stages of their projects provide experience in writing and presenting research communications.

91101

Cells, Genetics and Evolution

6cp; 6hpw (average)
Semester offered: Autumn
Offered at: St Leonards campus

This foundation subject in biological science introduces a number of associated topics relating to the cells as well as the whole organism. It covers general evolutionary principles, emphasising the biological diversity from genetic variation to the diversity of species and ecosystems. Topics include scientific inquiry, concept of science (as applied to evolutionary thought), principles of genetics, the nature of variation, and human evolution. Multimedia technology is integrated throughout the lecture and laboratory curricula.

Students normally work in groups of four in the three-hour laboratory block. Laboratory work is designed to involve students in investigation, problem-solving and discovery exercises and may involve computer simulation exercises supplementing other 'hands-on' activities with living organisms. Computer exercises allow students to further investigate principles of genetics, classification of organisms based on evolutionary relationships, evolutionary mechanisms, population ecology and other topics. Small group work develops communication skills. This unit introduces students to many of the fundamental concepts in biological sciences, and as such could also serve as an elective for other courses.

91102

Functional Biology

6cp; 6hpw (average)
Semester offered: Spring
Offered at: St Leonards campus

This foundation subject in the biological sciences, introduces a number of associated topics relating to animals and plants. The evolution and diversity of the Australian biota is discussed within the context of climate changes and other environmental factors. Adaptations of animals and plants are explored by considering how they function. Multimedia technology is integrated throughout the lecture and laboratory curricula.

The laboratory classes are normally three-hour blocks, designed to involve students in investigation, problem-solving and discovery exercises. Students work in small groups with computer simulation programs and other activities involving living organisms. The development of communication skills is recognised as a key strategy in this foundation subject.

This introductory unit focusing on the Australian environment and its animals and plants could serve as an elective for other courses.

91103

Honours Full Time (Medical and Molecular Biosciences) Part 1

24cp; prerequisite(s): BMedSc or BSc in Biomedical Science, Biotechnology or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

Study in this subject is designed to enhance the skills and knowledge necessary for research in the biological and biomedical sciences. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigation in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

91104

Honours Full Time (Medical and Molecular Biosciences) Part 2

24cp; prerequisite(s): 91103 Honours Full-time (Medical and Molecular Biosciences) Part 1
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

Study in this subject is designed to enhance the skills and knowledge necessary for research in the biological and biomedical sciences. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigation in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

91105

Honours (Environmental Science) 1

24cp per semester; prerequisite(s): BSc in Environmental Biology or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

Study in this subject is designed to enhance skills and knowledge in undertaking research in environmental science. The subject comprises 12 credit points of electives in a specialist field and a 36-credit-point equivalent individual research project where the student, under supervision, defines a problem in an area of interest, and then collects, analyses and interprets data to solve this problem. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and to develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis which comprises the main assessment component. Research ethics and scientific method are emphasised.

91106

Honours (Environmental Science) 2

24cp per semester; prerequisite(s): 91105 Honours (Environmental Science) 1
Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

Study in this subject is designed to enhance skills and knowledge in undertaking research in environmental science. The subject comprises 12 credit points of electives in a specialist field and a 36-credit-point equivalent individual research project where the student, under supervision, defines a problem in an area of interest, and then collects, analyses and interprets data to solve this problem. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and to develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis which comprises the main assessment component. Research ethics and scientific method are emphasised.

91110

Experimental Design and Sampling

6cp; prerequisite(s): 91395 Biocomputing, 33116 Statistical Design and Analysis or equivalent; 91102 Functional Biology
Semester offered: Autumn
Offered at: City campus

The principles and practice of scientific experimentation, with particular emphasis on biology. The essential steps in experimental design and analysis, and their roles. The source of experimental variability and the ways of effectively dealing with them. Environmental sampling procedures and designs. The logic of experimental and statistical hypothesis testing. The practical uses and limitations of these statistical tests in biology: multifactorial analysis of variance, correlation, multiple regression, chi-square. Techniques for analysing multivariate data, with emphasis on the pattern-analysis methods of ordination and clustering.

91111

Pollution Assessment

6cp; prerequisite(s): 65012 Chemistry 1A and/or 2A, or equivalent; 91102 Functional Biology
Semester offered: Autumn
Offered at: St Leonards campus

This subject presents an overview of the sources and classes of major pollutants in aquatic and terrestrial ecosystems, their fates in the environment and the means of assessing their impact on the biota. It introduces the concepts of bioaccumulation, biotransformations, acute and chronic toxicity as well as the applicability of field and laboratory methods in the biomonitoring process.

91112

Ecological Principles and Modelling

6cp; prerequisite(s): 91395 Biocomputing, 91102 Functional Biology
Semester offered: Spring
Offered at: St Leonards campus

This subject provides a foundation in the characteristics and functioning of populations and communities in terrestrial and aquatic ecosystems. It includes exploration of population and community processes, including inter- and intraspecific interactions and the origins of temporal and spatial patterns in communities and populations of plants and animals. This subject may include a field excursion which could be conducted before commencement of semester.

91113

Pollution Ecology

6cp; prerequisite(s): 91111 Pollution Assessment
Semester offered: Spring
Offered at: St Leonards campus

This subject addresses some of the current issues in pollution ecology and includes examination of relevant case studies. Natural and stress variability in ecosystems, snapshot versus long-term studies. Future development of toxicity assessment in ecotoxicology; microcosms, mesocosm, field studies. Early warning biomarkers of environmental degradation; impact of pollution of genetic diversity. Rehabilitation of contaminated sites, including bioremediation; alternatives to pesticides; endocrine disruptors and lifestyle effects of pollutants; toxicity modelling (QSARS and others); nexus between ecology of organisms and their apparent responses to contaminants; the science underlying environmental quality guidelines.

91114

Toxicity Assessment[1]

6cp; prerequisite(s): 65012 Chemistry 1A or equivalent; 91102 Functional Biology
Semester offered: Spring
Offered at: St Leonards campus

Physiological and cellular responses of organisms to toxic chemicals and the variety of assessment methods to compare their relative toxicities. Biological responses to toxic materials, conditions affecting their uptake and transformation, stress physiology; chronic and acute toxicity testing, bioassays and test protocols for terrestrial and aquatic systems (pesticides, herbicides); multispecies test. Biological and chemical principles of pest control; the safe use of pesticides. Criteria for selection of organisms; interpretation of test results; endpoints and biomarkers.

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[1] This subject is only available in odd years. Next available Spring 2003.

91116

Wildlife Ecology

6cp; prerequisite(s): 91309 Australian Biota
Semester offered: Autumn
Offered at: St Leonards campus

This subject covers a range of aspects including: wildlife ecology and management in Australia and worldwide; behavioural ecology of vertebrate wildlife; the ecology of threatened and endangered species; anthropogenic impacts on Australian wildlife; captive breeding programs and the role of national parks in conservation; the ecology of native and introduced pest animals; and conservation through sustainable use of wildlife.

91117

Freshwater Ecology

6cp; 6hpw; prerequisite(s): 91121 Aquatic Ecology
Semester offered: Spring
Offered at: St Leonards campus

This subject approaches the study of freshwater ecosystems synthetically through project-based teaching. This forms the focus in which the learning and application of limnological principles to resolving water-related issues are provided. It includes approaches to the assessment and management of freshwater ecosystems. It also introduces the importance that other disciplines such as sociology, economics and politics have on issues of the management of water resources. This subject requires significant interaction between students and community in the development and conduct of a targeted project.

91118

Fisheries Resources

6cp; prerequisite(s): 91112 Ecological Principles and Modelling; availability: this subject alternates with 98711 Management of Coasts, Oceans and Catchments and is next offered in Autumn 2004
Semester offered: Autumn
Offered at: St Leonards campus

Freshwater, estuarine and marine biological resources and their exploitation are examined. Problems of productivity against a background of regulations are explored, and the major management requirements for ESD of coastal and freshwater fisheries resources addressed. NSW and Australian practices are examined in relation to best practices elsewhere. Some classes are taught in excursion mode.

91119

Terrestrial Ecosystems

6cp; 3hpw; prerequisite(s): 91309 Australian Biota, 91110 Experimental Design and Sampling
Semester offered: Autumn
Offered at: St Leonards campus

This subject provides an advanced understanding of the characteristics and functioning of terrestrial ecosystems and is designed to strengthen and develop skills in the acquisition and analysis of data from terrestrial systems. Patterns and processes in terrestrial ecosystems. The influence of soil, fire, climate and history on the characteristics of terrestrial environments. Causes and effects of degradation of terrestrial systems; management issues.

This subject includes a compulsory field excursion which may be conducted before commencement of semester.

91120

Mapping and Remote Sensing

6cp; prerequisite(s): 91110 Experimental Design and Sampling; 66305 Fold Belts and Cratons
Semester offered: Autumn
Offered at: St Leonards campus

This senior subject caters to Environmental Biology and Science students who choose to major in Earth Sciences or Environmental and Urban Horticulture. It covers the properties of EM radiation and its interaction with the earth's atmosphere. Qualitative and quantitative analysis and interpretation of aerial photographs and satellite imagery including Landsat TM and SPOT data, and microwave and thermal imaging are included. Students are introduced to the techniques of Geographical Information Systems (GIS) and digital image enhancement using specialist computing software, and image processing, GIS design and analysis skills are provided. GIS is used to address issues associated with resources management, while remote sensing techniques are applied to the assessment of resources, such as forestry, coastal habitats and geological features.

91121

Aquatic Ecology

6cp; includes a compulsory field trip to Stroud, normally held in February; prerequisite(s): 91270 Plant Physiology, 91363 Animal Ecophysiology
Semester offered: Autumn
Offered at: St Leonards campus

Australian water resources. The hydrological cycle and catchment-water relationships. Structural components and functional processes of aquatic ecosystems; physical, chemical and biological features; nutrient cycles and energy flows. Distinctive features of lakes, wetlands, rivers and streams, estuaries, coastal lagoons and the sea. Ecology of algae, macrophytes, zooplankton, benthic macroinvertebrates, and vertebrates in aquatic systems. Food webs in aquatic ecosystems.

91122

Environmental Management

6cp; prerequisite(s): completion of Stages 1–5
Semester offered: Spring
Offered at: St Leonards campus

Environmental Management is examined from different perspectives including the socioeconomic and community aspects. Global issues as well as Australian environmental issues are considered. Integrated environmental management is offered as a means of limiting effects of problems. This is considered in the light of environmental ethics and legislation. Other aspects include risk environmental impact assessment and consequences including the evaluation process. Tools used for capacity building are developed. Several major case studies are explored. Agenda 21 issues and sustainable use of environmental resources are emphasised.

91124

Coastal and Marine Ecosystems

6cp; includes a five-day field excursion to Jervis Bay, normally held in February; prerequisite(s): satisfactory completion of Stages 1 and 2
Semester offered: Autumn
Offered at: Field excursion, St Leonards campus

The subject provides an introduction to marine ecology. It examines a wide range of temperate marine habitats and communities including: seagrasses, fishes, sandy shores, mangroves and intertidal invertebrates, as well as coastal geological processes. The subject includes 10 hours of formal lectures, 40 hours of practical work on site, a written exam and a report on one of the detailed investigations performed during the field trip.

Enrolment in this subject is restricted by the accommodation at the University of Canberra Field Station. Preference is given firstly to Environmental Biology students who are enrolled in the Coastal and Marine Sciences sub-major, and thereafter is based on academic performance over Stages 1 and 2.

91126

Coral Reef Ecosystems

6cp; includes a nine-day field excursion to Heron Island, normally held in July; prerequisite(s): 91124 Coastal and Marine Ecosystems
Semester offered: Spring
Offered at: St Leonards campus

During this senior level elective field subject, students examine in detail the ecology and geology of a coral reef environment. As part of the study, students carry out a group research project on an area of special interest with the reef environment. The subject requires a literature survey prior to attendance at the excursion and preparation of a field report following completion of the field work. The subject covers a range of aspects of the marine environment, including chemical, biological, physical and geological oceanography, in addition to the biology of fishes, benthic fauna, plants and sediments.

Enrolment in the subject is restricted by the availability of space at the Heron Island Research Station and preference is given firstly to Environmental Biology students who are enrolled in the Coastal and Marine Sciences sub-major, and thereafter is based on academic performance over Stages 3–5.

91127

Undergraduate Research Project

6cp
Semester offered: Autumn, Spring
Offered at: St Leonards campus

Students interested in this subject should contact their specific Course Director or Head of Department.

91128

Plant Biotechnology

3cp; 3hpw; prerequisite(s): 91314 General Microbiology, plus first-year Biology subjects
Semester offered: Spring
Offered at: St Leonards campus

Students are introduced to plant cell and tissue culture, and the application of these techniques to cloning, somatic embryogenesis, somaclonal variation, anther and pollen culture, and totipotent suspension as a means of multiplication, and determining phenotypic and genetic stability of tissue cultured plants. The program also includes media preparation and nutrient requirements, and the use of robotics and biofermentors in micropropagation. Pathogen detection and elimination, production of virus-free plants, pathogen indexing, certification of horticultural crops, plant quarantine, germplasm preservation, cryopreservation, long-term storage, and biosecondary metabolites are covered. Physiological status of micropropagated plants, transplanting and hardening-off stages are demonstrated, and practices and problems in micropropagation such as vitrification, phenolic exudates, vessel environment, and large-scale production are covered. Special emphasis is given to Australian indigenous and rare flora.

91129

Transfusion Science

8cp; 6hpw; prerequisite(s): 91354 Anatomical Pathology, 91355 Haematology 1, 91351 Immunology 1
Semester offered: Spring
Offered at: St Leonards campus

This subject covers the following topics: human blood groups; principles of donor blood compatibility and antigen/antibody reactions; detection and identification of serum antibodies; blood products; the safety of the blood supply and minimisation of transmission of infectious diseases; investigation of transfusion reactions; haemolytic disease of the newborn; blood groups in forensic investigations; platelet and leucocyte immunohaematology; transfusion in critical care situations; legal aspects of transfusion of blood products; stem cell transplantation; and cytokine stimulation of haemopoiesis.

91130

Cytopathology Part A

8cp; 6hpw; block mode; prerequisite(s): 91354 Anatomical Pathology, 91355 Haematology 1
Semester offered: Summer
Offered at: St Leonards campus

Instruction in the interpretation and diagnosis, at the light microscope level, of cell samples from a variety of anatomical sites. Morphologic features of cells in normal states, effects of inflammation, physiologic patterns, hormonal effects, changes due to specific organisms and viruses, premalignant and malignant conditions and the effects of treatments on cell morphology and smear patterns. Instruction on cell samples from the female genital tract, respiratory tract, alimentary tract, urinary tract, serous cavities, central nervous system, breast and thyroid with emphasis on fine needle aspiration samples. Principles and procedures of specimen collection, preparation and staining, reporting methodology and laboratory procedures are covered. Epidemiologic and aetiologic factors in premalignant and malignant diseases and special procedures which complement cytopathologic diagnosis are included.

91131

Cytopathology Part B

8cp; 6hpw; block mode; prerequisite(s): 91354 Anatomical Pathology, 91355 Haematology 1; 91130 Cytopathology Part A
Semester offered: Summer
Offered at: St Leonards campus

Instruction in the interpretation and diagnosis, at the light microscope level, of cell samples from a variety of anatomical sites. Morphologic features of cells in normal states, effects of inflammation, physiologic patterns, hormonal effects, changes due to specific organisms and viruses, premalignant and malignant conditions and the effects of treatments on cell morphology and smear patterns. Instruction on cell samples from the female genital tract, respiratory tract, alimentary tract, urinary tract, serous cavities, central nervous system, breast and thyroid with emphasis on fine needle aspiration samples. Principles and procedures of specimen collection, preparation and staining, reporting methodology and laboratory procedures are covered. Epidemiologic and aetiologic factors in premalignant and malignant diseases and special procedures which complement cytopathologic diagnosis are included.

91132

Molecular Biology 1A

6cp; 6hpw; prerequisite(s): 91314 General Microbiology; 91313 Biochemistry 1
Semester offered: Spring
Offered at: St Leonards campus

This subject provides an introduction to the basics of molecular biology and an understanding of the key concepts underlying the experimental techniques of DNA manipulations of a molecular biology laboratory. Topics covered include: DNA and RNA isolation, restriction enzymes, DNA ligation, cloning strategies; southern, northern and western blotting; and an introduction to DNA sequencing and PCR. Emphasis is also placed on the use of databases to retrieve and analyse nucleic acid and protein sequences. This subject encourages students to become adept at the techniques required for molecular analysis in a modern scientific laboratory, and provides a foundation for more advanced molecular biology subjects.

91133

Honours (Biological and Biomedical Sciences) Part 1 (PT)

12cp; prerequisite(s): BSc in Environmental Biology, or equivalent three-year degree
Semester offered: Autumn, Spring
Offered at: St Leonards campus

Study in this subject is designed to enhance the skills and knowledge necessary for research in the biological and biomedical sciences. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigation in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

91134

Honours (Biological and Biomedical Sciences) Part 2 (PT)

12cp; prerequisite(s): 91133 Honours (Biological and Biomedical Sciences) Part 1 (PT)
Semester offered: Autumn, Spring
Offered at: St Leonards campus

Study in this subject is designed to enhance the skills and knowledge necessary for research in the biological and biomedical sciences. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigation in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

91135

Honours (Biological and Biomedical Sciences) Part 3 (PT)

12cp; prerequisite(s): 91134 Honours (Biological and Biomedical Sciences) Part 2 (PT)
Semester offered: Autumn, Spring
Offered at: St Leonards campus

Study in this subject is designed to enhance the skills and knowledge necessary for research in the biological and biomedical sciences. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigation in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

91136

Honours (Biological and Biomedical Sciences) Part 4 (PT)

12cp; prerequisite(s): 91135 Honours (Biological and Biomedical Sciences) Part 3 (PT)
Semester offered: Autumn, Spring
Offered at: St Leonards campus

Study in this subject is designed to enhance the skills and knowledge necessary for research in the biological and biomedical sciences. The principal activity is an individual research project in which the student, under supervision, plans and undertakes investigation in an area of interest. The data collected are then subjected to analysis and interpretation under the guidance of the supervisor. Students learn to define objectives and aims, work to available time and resources, use appropriate research methods, critically assess information and develop complex arguments in detail. The findings of the research project are presented in a structured and integrated thesis, which comprises the main assessment component.

91137

DNA Profiling

6cp; 5hpw; prerequisite(s): 91332 Molecular Biology 1A; corequisite(s): 65543 Crime Scene Investigation
Semester offered: Autumn
Offered at: St Leonards campus

This subject examines advanced molecular biological techniques, and the performance of both nuclear and mitochondrial DNA Laboratory extraction procedures from a variety of samples. DNA extract amplification and examination using the standards is highlighted as required for court admissible evidence. Population genetics and population structure is addressed in relation to relevance of results. Basic population statistics and likelihood ratios is discussed in relation to considerations, quality control, proficiency testing and accreditation. Students study the applications of these techniques in quarantine, customs and wildlife management.

91138

Investigation of Human Remains

6cp; 5hpw; prerequisite(s): 91701 Medical Science 1, 91702 Medical Science 2; corequisite(s): 65543 Crime Scene Investigation
Semester offered: Autumn
Offered at: St Leonards campus

This subject includes the function of the coroner and the coronial system to investigate death, changes that occur to the mammalian corpse after death and recovery of skeletonised remains. It covers all methods that can be used to estimate time of death, disposal of the dead and decomposition; methods used by forensic pathologists to distinguish between natural aging and disease from accidental injury or intentional wounding. It discusses issues of injuries by blunt or sharp weapons, force, bruising, abrasion and laceration, gunshot injuries, asphyxia, drowning, electrocution, poison, fire and mass disaster (including Disaster Victim Identification [DVI] procedures). Also discussed here are: the use of dentition and dental records for victim identification; and osteological and anthropological methods to identify, race, sex and age of victims. Issues of religious beliefs, ethics and Koori rights are also discussed.

91139

Complex Forensic Cases (Biology)

6cp; 5hpw; prerequisite(s): 65543 Crime Scene Investigation, 91137 DNA Profiling, 91138 Investigation of Human Remains; corequisite(s): 79024 Complex Forensic Cases (Law)
Semester offered: Spring
Offered at: St Leonards campus

This subject examines some cornerstone cases in biological evidence, which lead to changes in testing and court procedures. The subject also includes working through mock cases, making decisions on what samples to take and analyses to perform, along with relevant controls and reference samples. A court report is written (submitted for marking) and evidence relating to the case presented in a mock trial. The report details the case strategy, relevant quality assurance, control, reference samples and significance of the findings.

91141
Biological Evidence

6cp; 5hpw; prerequisite(s): 65241 Principles of Forensic Science
Semester offered: Spring
Offered at: St Leonards campus

This subject introduces the nature, value and relevance of biological materials as forensic evidence. Different methods for the identification of various biological samples are examined along with the techniques which are used to classify, differentiate and identify the source of biological material. The analysis and interpretation of DNA evidence are emphasised. Lectures are complemented by an extensive practical program including collection procedure, use of PCR technology and population statistics.

91142
Biotechnology

6cp; 6hpw; prerequisite(s): first-year Biology or Medical Science subjects; corequisite(s): 91313 Biochemistry 1 or 91314 General Microbiology
Semester offered: Autumn
Offered at: St Leonards campus

This subject provides an overview of the discipline of biotechnology encompassing the traditional industries of food and industrial (chemical) biotechnology to the more recent high-technology applications in agriculture and medicine. The emphasis is placed on the principles and processes of biological manipulation and the resulting product. Practical projects are used along with relevant site visits and workshops to demonstrate specific applications.

91233
Plant Production and Growing Systems

6cp; prerequisite(s): 65012 Chemistry 1A, 91102 Functional Biology
Semester offered: Autumn
Offered at: St Leonards campus

Cultivation of both exotic and native plants of value in urban horticulture. Skills necessary for the cultivation, selection and modification of stocks for particular situations are developed. The principles of water use, irrigation and associated problems within nurseries and intensive cultivation systems are covered. Also studied are the physical and chemical properties of horticultural potting mixes; methods of analysis; supply of nutrient, water, air and ions; management of potting mixes; and problems with mixes. Formulation and use of growth media; media used in hydroponics.

91234
Australian Plants and Biotechnology

6cp; prerequisite(s): 65022 Chemistry 2A or equivalent; corequisite(s): 91309 Australian Biota
Semester offered: subject to demand
Offered at: St Leonards campus

The potential of Australian plants for horticultural exploitation, e.g. cut flowers, essential oils, source of foods and pharmaceuticals are considered. Identification of Australian plants as promising future plant crops, difficulties experienced in propagation and cultivation and status of this area of horticulture. Students are asked to write a research proposal for a chosen plant to be developed as a horticultural crop with an emphasis on problems related to growing plants in controlled environments or in open situations. Australian tree species, which could substitute for exotic trees in urban street planting, or as wind breaks. This subject involves field trips to wildflower farms, botanic gardens and national park. There is also a three-day field trip during a study week.

91237
Plant Pathology

6cp; prerequisite(s): 91270 Plant Physiology
Semester offered: Spring
Offered at: St Leonards campus

This subject provides knowledge of the main group of plant pathogens causing plant diseases, and an understanding of their mode of attack and prevention from spreading. The recognition of signs and symptoms is introduced. The influence of environmental conditions on disease development is examined. Methods of prevention are discussed. Visits to Plant Quarantine at Rydalmere, Narara Research Station and Nursery are arranged. Collection, preservation and identification of plant pathogens form a component of this subject.

91246
Plant Structure, Function and Culture

6cp
Semester offered: Autumn
Offered at: St Leonards campus

This subject introduces students to a wide variety of plant materials used in urban (environmental) horticulture. Plant materials studied include annual, perennial, herbaceous, wood, exotic, and native plant species. These plant materials are studied within the context of their uses for enhancement of the urban surroundings. The subject also introduces students to plant morphology and anatomy in relation to plant function, through the study of plant organs and tissues, with a particular focus on vegetative biology. Also studied are techniques of plant propagation, both sexual and asexual, including seeds, cuttings, budding, grafting, layering, separation and division.

91247

Landscape Design and Plant Culture

6cp; prerequisite(s): 91246 Plant Structure, Function and Culture
Semester offered: subject to demand
Offered at: St Leonards campus

This subject introduces students to landscape studies by considering the impact of humans on the landscape, the history of people/plant/landscape interactions including the history of gardens, and the process of landscape design in relation to current practice in Australia. The subject also introduces students to a wide variety of plant materials used to enhance urban surroundings, including annual, perennial, herbaceous, woody, exotic and native plant species. Also studied are techniques of plant propagation. The subject provides an introduction to irrigation systems used in nurseries and open space areas, including computerised systems, and methods of greenhouse environmental control.

91248

Plant Production Systems[1]

6cp; prerequisite(s): 91246 Plant Structure, Function and Culture
Semester offered: Spring
Offered at: St Leonards campus

This subject consists of two equal parts: plant tissue culture and horticultural production management. In plant tissue culture students are introduced to plant cell and tissue culture, and the application of these techniques to cloning, somatic embryogenesis, somaclonal variation, anther and pollen culture, totipotent suspension as means of multiplication, phenotypic and genetic stability of tissue cultured plants. The program also includes media preparation, and nutrient requirements. Use of robotics and biofermentors in micropropagation. Pathogen detection and elimination, production of virus-free plants, pathogen indexing, certification of horticultural crops. Plant quarantine and international shipment of tissue cultures plants. Germplasm preservation; cryopreservation, long-term storage. Biosecondary metabolites. Physiological status of micropropagated plants, transplanting, hardening-off stages. Practices and problems in micropropagation such as vitrification, phenolic exudates, vessel environment. Laboratory design and large-scale production. Students are introduced to experiments involving plant tissue culture technology. Special emphasis is given to Australian indigenous and rare flora.

Horticultural production management develops students' understanding of the technical aspects of nursery management and plant production. Cost-benefit analysis is made of the daily operations of commercial enterprises ranging from plants produced in tissue culture to open area growth of flowers, to the intensive controlled growth of potted plants in the greenhouses. Also covered are the technical aspects of personnel management, and seasonal and budgetary factors involved. Cost-benefit analysis of physical, biological, and human resources is considered. Long-term and construction design of plant production units are discussed.

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1 Not offered in 2003.

91249

Plant Population Genetics and Biodiversity

6cp; prerequisite(s): 91237 Plant Pathology, 91270 Plant Physiology
Semester offered: Spring
Offered at: St Leonards campus

This subject covers the biochemical and cellular processes including molecular genetics and control of genetic activity in cells, and environmental influences amongst individuals and populations. The subject introduces students to cloning, somatic cell genetics and hybridisation. The work also includes the control of cell activity by DNA and protein synthesis, and hormonal control of plant processes. The importance of cytoplasmic inheritance is introduced as is the genetic manipulation of the plant genome. Traditional methods of plant breeding and production of pure seed and stocks are also covered.

91250

Management of Plants in Landscapes

6cp; prerequisite(s): 91270 Plant Physiology
Semester offered: Autumn
Offered at: St Leonards campus

This subject is designed to develop the student's understanding of the uses of plant materials (especially woody plants) in the landscape as part of the function of open space management. The subject considers the benefits of plants, techniques for selecting appropriate plants of good quality for particular purposes and sites, methods of establishing these plants and management techniques necessary to maintain plant health, including the diagnosis and management of plant problems. Integral to this subject are site visits to open space developments around Sydney and discussions with the managers of these areas.

91270

Plant Physiology

6cp; prerequisite(s): 91102 Functional Biology
Semester offered: Autumn, Spring
Offered at: St Leonards campus

This subject covers plant interactions with their environment; the acquisition of carbon dioxide, water and nutrients by plants; photosynthesis; responses of plants to environmental stress and the recognition of stress conditions; and measurement of plant function and of factors affecting plant performance.

91309

Australian Biota

6cp; prerequisite(s): 91102 Functional Biology
Semester offered: Spring
Offered at: St Leonards campus

This subject covers the principles and practice of taxonomy and evolutionary biology; the limitations and usefulness of taxonomic tools in botany and zoology; the major Australian groups of plants, vertebrates and invertebrates; the biogeography of Australian plants and vertebrates; the design and use of identification keys; and collection, identification and preservation of specimens from the field. This subject may include a field excursion.

91313

Biochemistry 1

6cp; 6hpw; prerequisite(s): 65012 Chemistry 1A or equivalent; 91101 Cells, Genetics and Evolution or 91701 Medical Science 1; corequisite: 65022 Chemistry 2A
Semester offered: Spring
Offered at: St Leonards campus

This subject provides an understanding of the central place of biochemistry in life sciences. It introduces the structure and function of biologically important molecules including monosaccharides, polysaccharides; fatty acids, lipids; amino acids, peptides, proteins; nucleosides, nucleotides, and nucleic acids. By completing the subject, students should have an understanding of the significant features of these molecules such as: the structure and folding of proteins; protein specialisation – fibrous proteins; functional proteins – haemoglobin, enzymes, vitamins, cofactors and regulation; and the role and function of lipids in cell membranes. The subject includes DNA structure and its replication; transcription, translation and protein synthesis.

This is a foundation subject, providing basic information relevant to many other areas of study. The subject is designed to develop attributes of critical thinking and problem solving essential to scientists.

91314

General Microbiology[1]

6cp; 5hpw; prerequisite(s): first-year Biology or Medical Science subjects
Semester offered: Autumn
Offered at: St Leonards campus

This subject provides an introduction to the structure, function and taxonomy of the bacteria, fungi, protozoa and viruses. Several key topics in the study of microbiology are discussed including microscopy, sterilisation and disinfection, microbial nutrition and growth, and antibiotics and the classification and identification of microorganisms. Basic mycology also covers their role in disease and the environment. The mode of transmission and symptoms of important diseases caused by both parasites, such as malaria, sleeping sickness, schistosomiasis, elephantiasis, and viruses such as HIV and hepatitis, are studied. The practical exercises give the student experience of the principal laboratory procedures for the isolation, manipulation, growth and identification of microorganisms.

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[1] This subject was formerly called Microbiology 1.

91320

Biochemistry 2

6cp; 6hpw; prerequisite(s): 91313 Biochemistry 1
Semester offered: Autumn
Offered at: St Leonards campus

This subject introduces students to cellular metabolism and energy transfer mechanisms. It provides an overview of the main carbohydrate catabolic and anabolic pathways including glycolysis, Krebs cycle and oxidative phosphorylation, photosynthesis, gluconeogenesis and glycogen metabolism. It provides an understanding of nitrogen and fatty acid metabolism, and the metabolic specialisation of tissues and the relationships between tissues. Cell signalling and the role signals/hormones in maintaining homeostasis is explored.

This understanding of cell function provides a foundation for many subjects in biological and biomedical sciences. Emphasis is placed on mastering an understanding the principles of cellular reactions and their application to diverse cell types. The subject also introduces the basic tools and methods of biochemical reasoning, and the presentation of results in written format.

91326

Analytical Biochemistry

6cp; 6hpw; prerequisite(s): 91313 Biochemistry 1
Semester offered: Spring
Offered at: St Leonards campus

This subject examines modern methods in biochemical analysis emphasising instrumentation, underlying principles, aims and strategies. It covers spectroscopic methods, spectrophotometry, spectrofluorometry flame emission and absorption photometry, magnetic resonance, mass spectrometry; chromatography principles and practice; GLC, HPLC; electrophoresis, centrifugation; applications to nucleic aids and proteins; cryoscopic osmometry; electrochemical methods; potentiometry and ion electrodes, polarography; introduction to radiochemistry; and immunoassay methods.

91330

Epidemiology and Public Health Microbiology

6cp; 6hpw; prerequisite(s): 91314 General Microbiology
Semester offered: Spring
Offered at: St Leonards campus

Public health microbiology. Basic epidemiological principles; mathematical formulation of epidemics; measures of disease frequency (rates and risk factors); sociological aspects. The public health laboratory environment; food, water and airborne diseases; exotic and notifiable diseases; zoonoses. Application of bacterial enumeration and identification techniques to the examination of water and food. Epidemiological tracing methods; biotyping; serotyping; bacteriophage typing; bacteriocin (BLIS) typing; molecular typing. Control measures; hygiene; sanitation; disinfection; sterilisation; vaccines, vaccination procedures and vaccination programs.

91332

Molecular Biology 1

8cp; 6hpw; prerequisite(s): 91314 General Microbiology, 91313 Biochemistry 1
Semester offered: Spring
Offered at: St Leonards campus

Introduction to the basis of present-day molecular biology. Key concepts and procedures underlying DNA manipulation methods in the molecular biology laboratory, including the isolation of nucleic acids and the molecular cloning, selection and analysis of recombinant DNA. Topics covered include: DNA and RNA isolation; restriction enzymes; DNA ligation; transformation of DNA into cells; cloning strategies; southern, northern and western blotting; and an introduction to DNA sequencing and the PCR. Lectures, tutorials, practicals and assignments are fully integrated so that topics are covered extensively and are delivered by alternative teaching modes. These modes include flexible learning practices such as the provision of similar information by way of lectures, practical experimentation, teaching video tutorials, and problem assignments, the last of these involving the use of Internet Molecular Biology Sites and UTS MacVector software. Students are expected to become adept at retrieving and analysing nucleic acid and protein sequences from databases. Flexible assessment is used for the purpose of accommodating variations in the competence and diligence of students in the different assessment tasks.

91335

Molecular Biology 2

8cp; 6hpw; prerequisite(s): 91332 Molecular Biology 1
Semester offered: Spring
Offered at: St Leonards campus

Structure and organisation of the eukaryotic genome. Control of genome expression by regulation of RNA synthesis, processing and translation. Fundamental genomics and bioinformatics. Application of molecular techniques, such as: hybridisation, sequencing, polymerase chain reactions and western blotting. Preparation of DNA libraries. Clinical applications of molecular biology in inherited disease detection and infectious disease diagnosis.

91338

Clinical Bacteriology

8cp; 6hpw; prerequisite(s): 91330 Epidemiology and Public Health Microbiology
Semester offered: Autumn
Offered at: St Leonards campus

Quantitative methods, reliability studies, automation, data processing and numerical analysis in clinical microbiology. Pathogenic microorganisms: their handling (including safety requirements), cultivation, isolation and relationship to the indigenous flora of humans and animals. A detailed study of staphylococci, streptococci, coryne-bacteria, mycobacteria, neisseria, enteric bacteria, pasteurellae, pseudo monads and spirochaetes. Antibiotics and antibiotic sensitivity testing.

91344

Medical and Diagnostic Biochemistry

8cp; 6hpw; prerequisite(s): 91320 Biochemistry 2
Semester offered: Autumn
Offered at: St Leonards campus

This subject is designed to introduce the basic concepts of medical biochemistry relevant to biotechnology, medical research and clinical analysis. It is structured in such a way that it analyses the basic biochemical abnormalities that lead to various disease states, their diagnosis, clinical analysis and final treatment. The major areas covered are abnormal kidney and liver function, biochemistry of haemoglobin pigments and their relation to disease. Abnormalities of carbohydrate metabolism such as diabetes, clinical enzymology and serum proteins in health and disease, the principles of laboratory management, with special emphasis on safety, quality control and automation are also covered.

91345

Biochemistry, Genes and Disease[1]

8cp; 6hpw; prerequisite(s): 91320 Biochemistry 2
Semester offered: Autumn, Spring
Offered at: St Leonards campus

This subject covers: biochemical and genetic aspects of human diseases for students planning careers in medical science, diagnostic biochemistry, molecular biology and biotechnology; biochemical detection of disturbances in acid-base homeostasis and renal function; calcium and bone disorders, such as osteoporosis; lipid metabolism and genotypes associated with familial hyperlipidaemia; assessment of thyroid and adrenal hormonal status using radioimmunoassay techniques; genetic basis of tests used to screen newborn infants for inborn errors of metabolism, e.g. phenylketonuria and cystic fibrosis, and for heritable diseases affecting adults such as haemaochromatosis (iron overload); scientific and social impacts of the human geonome project and discoveries of genotypes predisposing individuals to diseases such as bowel and breast cancer; current approaches to gene therapy for diabetes and other diseases; cancer chemotherapy and multidrug resistance; and directed practicals and student project to evaluate test procedures used to detect and monitor the diseases covered.

1 This subject was formerly called Clinical Biochemistry 2.

91351

Immunology 1

3cp; 3hpw; prerequisite(s): 91314 General Microbiology, 91313 Biochemistry 1, 91351 Haematology 1
Semester offered: Spring
Offered at: St Leonards campus

This subject is designed to introduce the basic concepts of immunology. It is structured in such a way that it follows the course of an immune response, from initial non-specific reactions to the development of adaptive responses and immunological memory. Emphasis is given to the basic concepts that underlie the recognition of foreignness and the response to infection. The practical sessions introduce students to a variety of cellular and serological techniques that are the cornerstones of immunological analysis. In addition, special interactive teaching sessions are used to explore contemporary topics in immunology.

91352

Parasitology

8cp; 6hpw; prerequisite(s): 91314 General Microbiology, 91332 Molecular Biology 1, 91351 Immunology 1
Semester offered: Spring
Offered at: St Leonards campus

This subject covers the following topics: parasitism; biology of parasitic worms including nematodes, trematodes and cestodes; biology of parasitic protozoa including the sporozoans, flagellates, amoeba and ciliates; arthropods as vectors of disease; clinical parasitology; molecular biology of parasites; immunity and vaccine development; and antiparasitic therapy.

91354

Anatomical Pathology

6cp; 6hpw; prerequisite(s): 91702 Medical Science 2, 65022 Chemistry 2A
Semester offered: Autumn
Offered at: St Leonards campus

This subject provides a basic knowledge of disease processes, the body's responses to them, the preparation and staining of mammalian tissues for microscopic examination of organ structure, and light microscopic appearance of diseased tissues.

The subject also introduces the chemistry of biological dyes and their uses in the laboratory to highlight normal tissue structures and to demonstrate pathological tissue changes that occur during disease development.

This is all integrated to present an understanding of disease with its morphological appearance and the laboratory techniques used to interpret structural tissue changes that occur in disease states.

91355

Haematology 1

3cp; 3hpw; prerequisite(s): 91354 Anatomical Pathology; 91314 General Microbiology or 91313 Biochemistry 1
Semester offered: Spring
Offered at: St Leonards campus

Structure, function and morphology of normal blood and bone marrow. Haemostasis and haematopoiesis. Automated laboratory equipment used in haematology. Introduction to haematological disease and the significance of haematological changes in disease.

91358

Haematology 2

8cp; 6hpw; prerequisite(s): 91355 Haematology 1
Semester offered: Autumn
Offered at: St Leonards campus

This subject covers disease processes related to hereditary, acquired, benign and malignant disorders of haematological systems; correlation of physiological processes, pathological states and diagnostic tools in haematology; light microscopic morphological examination of peripheral blood and bone marrow in disease and correlation of these findings with indices and cell counts obtained by automated laboratory equipment; procedures for detection and precise diagnosis of anaemias, haemostatic disorders, haemoglobin disorders and haematological malignancies; introduction to cytogenetics; prenatal diagnosis of genetic disease; and genetic counselling and cancer cytogenetics.

91359

Immunology 2

8cp; 6hpw; prerequisite(s): 91351 Immunology 1
Semester offered: Spring
Offered at: St Leonards campus

This subject provides current concepts of modern immunology to students who have some basic understanding of the subject, and an appreciation of the wide spectrum of applied immunology in medicine, research and industry. Specialised areas of immunology covered include genetics of antibody diversity; structure of antibodies, T-cell receptor and MHC molecules; cytokines; monoclonal antibodies; clinical immunology and techniques applicable in both diagnostic and research laboratories including enzyme-linked immunoassays; and cell separations and flow cytometry.

91363

Animal Ecophysiology

6cp; prerequisite(s): 91102 Functional Biology
Semester offered: Spring
Offered at: St Leonards campus

This subject examines basic concepts in ecophysiology; limiting factors, lethal limits, acclimation; patterns of physiological responses to natural and selected manufactured stressors; coordination of physiological processes with environmental factors;

neuro-endocrine control of life cycles and physiological responses and stress syndrome; population changes; and basic animal population dynamics, structure, growth and regulation of populations.

91368

Bioreactors and Bioprocessing

8cp; 6hpw; prerequisite(s): 91313 Biochemistry 1, 91314 General Microbiology
Semester offered: Spring
Offered at: St Leonards campus

This subject covers the practical aspects of modern biotechnology including bioreactor operation, microbial kinetics, extraction techniques and downstream processing. It includes the microbiological physiological and biochemical basis of industrially useful fermentations in food, beverage, pharmaceutical and other relevant industries. Economic and other factors impinging on the operation of fermentation industries are also undertaken in this subject. The theory and laboratory practice is further developed by visits to local biotechnology businesses.

91369

Biobusiness and Environmental Biotechnology

8cp; 6hpw; prerequisite(s): 91314 General Microbiology, 91330 Epidemiology and Public Health Microbiology recommended
Semester offered: Autumn
Offered at: St Leonards campus

This subject explores microbial habitats, the microbial biogeochemical cycles and environmental biotechnology including sewage treatment, industrial/agricultural waste, biodegradation, bioremediation, microbial mining and biofuels. Also included in this subject are quality control techniques, ISO9000, ISO14000, HACCP, legislation, intellectual property and the financing, establishment and management of biotechnology companies. Industrial visits are an important component of this subject.

91370

Semi-arid Ecology

6cp; block mode; 10–14 day field excursion to far western NSW in July every third year, alternating with 91371; prerequisite(s): 66204 Field Studies 1; availability: this subject is next offered in 2003
Semester offered: Autumn
Offered at: St Leonards campus

This and other extended field electives are normally taken in the senior stages of the degree course. It is assumed that students have a thorough knowledge of basic ecology. The aim is to broaden students' understanding of environmental biology and its management applications by demonstration and experimentation outside the Sydney Basin. The importance of water and water management, rangeland management and national park management of dry areas is included, along with ecological studies of factors determining the structure and composition of semiarid vegetation. Assessment involves submission of a log book/journal and a project report or presentation, to be completed after the field excursion.

Enrolment in the subject is restricted by the availability of space in vehicles. Preference is given firstly to Environmental Biology students who are enrolled in any of the named electives/second majors, and thereafter is based on academic performance over Stages 2–4.

91371

Forest and Mountain Ecology

6cp; block mode; 10–14 day field excursion to southern NSW in December every third year and excursion to northern NSW in July every third year, alternating with 91370; prerequisite(s): 66204 Field Studies 1; availability: this subject is next offered in 2004
Semester offered: Winter
Offered at: n/a

This and other extended field electives are normally taken in the senior stages of the degree course. It is assumed that students have a thorough knowledge of basic ecology. The aim is to broaden students' understanding of environmental biology and its management applications by demonstration and experimentation outside the Sydney Basin. Topics include the ecology of tall forests and mountain areas, and the management of mountain forests, the impacts of forestry operations, and the management of national parks and wilderness areas. Assessment involves submission of a log book/journal and a project report or presentation, to be completed after the field excursion.

Enrolment in the subject is restricted by the availability of space in vehicles. Preference is given firstly to Environmental Biology students who are enrolled in any of the named second majors, and thereafter is based on academic performance over Stages 2–4.

91395

Biocomputing

3cp; prerequisite(s): 33116 Statistical Design and Analysis or 33112 Statistical Design and Analysis Part A
Semester offered: Spring
Offered at: St Leonards campus

This subject provides an introduction to computers and programs in the biological sciences. It analyses the operation of computer systems with emphasis on principles of hardware architecture, operating systems, editors and file management. It compares various types of computers, IBM PC, Macintosh, mainframe, and various software packages available for the biological and biomedical sciences.

91398

Special Reading Assignment – Life Sciences

4cp
Semester offered: Autumn, Spring
Offered at: St Leonards campus

This subject can only be undertaken following prior negotiation on the part of the student with a full-time member of academic staff regarding individual supervision. In addition, special permission of the Associate Dean (Teaching and Learning) is required.

91399

Individual Project – Life Sciences

8cp
Semester offered: Autumn, Spring
Offered at: St Leonards campus

This subject can only be undertaken following prior negotiation on the part of the student with a full-time member of academic staff regarding individual supervision. In addition, special permission of the Associate Dean (Teaching and Learning) is required.

91403

Medical Imaging

6cp; 3hpw
Semester offered: n/a
Offered at: n/a

This subject provides advanced understanding of medical imaging technology. It covers a historical overview, mathematical preliminaries, and examination of specific imaging modalities: conventional X-rays, ultrasound, computer assisted tomography (CAT), emission tomography, magnetic resonance (MR) imaging. A generic system view is introduced but the principles of the image acquisition process for each modality are also covered. The subject includes lectures, tutorials, and a hospital visit.

91429

Physiological Bases of Human Movement

6cp; prerequisite(s): 27180 Functional Kinesiology; 65014 Chemistry (Human Movement)
Semester offered: subject to demand
Offered at: St Leonards campus

This subject examines the structure and function of the major systems of the body. It serves as an introduction to life processes in the healthy state and the physiological bases underpinning human movement.

91499

Current Topics in Science and Technology

12cp; approximately 20hpw of self-directed learning
Semester offered: Autumn, Spring
Offered at: St Leonards campus

This is a self-directed learning subject, normally for students enrolled in the Master of Science Management program. It is designed to facilitate the student's professional development in a science or technology discipline of his or her choice. Each student negotiates an individual learning contract with the Subject Coordinator. Learning activities are not restricted, but may include any of the following (individually or in combination): critical review of the literature on a topic; individual or group research project; study in appropriate science and technology subjects at UTS. Appropriate work-based activity may be included if the Faculty of Science is satisfied that adequate supervisory arrangements exist. Students attempting this subject must submit a draft Learning Plan to the Subject Coordinator in or before the first week of semester.

91701

Medical Science 1

6cp; 6hpw
Semester offered: Autumn
Offered at: City campus

This subject provides an introduction to the anatomy and physiology of the healthy human body. Lectures are complemented by an appropriate practical program. The content includes: the levels of organisation in the body; basic anatomy, anatomical terms, surface anatomy and body regions and overview of major organ systems; transport of materials across membranes, osmosis diffusion, active transport; the principles of mitosis and meiosis; the basic concepts of microscopy and the histology of tissues; basic microbiology and aseptic technique; and the structure function and histology of the skin, the blood, the muscoskeletal, endocrine and nervous system.

91702

Medical Science 2

6cp; 6hpw; prerequisite(s): 91701 Medical Science 1
Semester offered: Spring
Offered at: City campus

This subject completes the coverage of the anatomy and physiology of the body systems begun in 91701 Medical Science 1. It is also designed to foster an appreciation of the interactions between and control of all body systems. Independent learning as well as critical analysis and communication skills are also developed in this unit. Topics include: structure and function of the respiratory, endocrine, nervous, reproductive and immune systems along with relevant clinical applications in each system.

91703

Physiological Systems

6cp; 4hpw; prerequisite(s): 91702 Medical Science 2
Semester offered: Autumn
Offered at: City campus

This subject extends the knowledge and understanding of cellular elements of the body and of certain body organ systems that were introduced in the subjects 91701 Medical Science 1 and 91702 Medical Science 2. It provides an understanding of cell membrane transport processes and how these principles apply to the body; the importance of ion channels generally in cell physiology and the application of ion channels to nanotechnology; the role of ion channels in the physiology of the cardiovascular system; and mechanisms of fluid secretion in the kidneys and regulation of extracellular fluid composition and volume. The subject encourages students to be active learners.

91704

Behavioural Sciences

6cp; 4hpw; prerequisite(s): 33112 Statistical Design and Analysis or equivalent, 91703 Physiological Systems
Semester offered: Spring
Offered at: City campus

The overall aim of this study is to demonstrate the significance of contributions of theories and practices from the behavioural sciences to effective medical theory and practice. Key concepts, principles and theories from the behavioural sciences that have particular relevance to the medical sciences are explored within the framework of selected health care and medical scenarios such as chronic pain, the placebo effect, depression, cardiovascular disease, health promotion. Content provides an introduction to the field of behavioural medicine, which addresses the application of theory and practice of the behavioural sciences to the theory and practice of modern medicine. Students have practical experience in the application of principles from cognitive learning theory in design and completion of behavioural monitoring and self-management programs.

91705

Medical Devices and Diagnostics

6cp; 6hpw; prerequisite(s): 68041 Physical Aspects of Nature or 68101 Foundations of Physics, 91703 Physiological Systems
Semester offered: Spring
Offered at: City campus

This subject provides an introduction to the principles of operation and use of typical devices encountered in medical practice. Specific emphasis is given to various methods of transducing information from the body such as pressure, internal voltage signals, oximetering temperature. Principles of active stimulation of various organs such as heart, muscle and cochlear are also taught. A medical overview of the regulatory framework imaging modalities explored is also given.

91706

Neuroscience

8cp; 4hpw; prerequisite(s): 91703 Physiological Systems
Semester offered: Autumn
Offered at: City campus

This subject provides an advanced understanding of the physiological basis of the nervous system. It covers physiology of excitable tissue, with particular reference to coordination and control of ion channels; functions of the nervous system, with special reference to systems including complex reflex systems, control of posture and movement, cutaneous, deep and visceral sensation, central regulation of visceral function, vision, hearing and equilibrium, smell and taste; and case studies of disease states in the nervous system. Emphasis is placed on student participation as active learners, for example in presentation of case studies and seminars.

91707

Pharmacology 1

8cp; 6hpw (average); prerequisite(s): 91313 Biochemistry 1, 91703 Physiological Systems
Semester offered: Autumn
Offered at: City campus

This subject provides the introductory principles governing drug and xenobiotic action to be developed further in 91709 Pharmacology 2. It is designed to foster a problem-solving approach to pharmacology with particular emphasis on applying molecular pharmacology concepts to pathophysiological problems. Major objectives are to develop the concepts of dose response relationships and the specificity of drug action. Therapeutic index and the concept of selective toxicity. Pharmacokinetic factors and their role in pharmacotherapy. Chemical neurotransmitters, ion channels and receptors as determinants of drug action in the central and peripheral nervous systems. Clinical efficacy of the major pharmacology drug classes used in the treatment of pathophysiological processes involving the cardiovascular, renal and nervous systems. Lectures are complemented by a tutorial/practical program which emphasises the clinical nature of the subject and develops lecture material using a variety of experimental, tutorial, computer-simulation and case-study approaches.

91708

Psychophysiology

8cp; 6hpw; prerequisite(s): 91704 Behavioural Sciences
Semester offered: Spring
Offered at: City campus

This subject builds on material provided in Behavioural Sciences. It provides the student with a solid grasp of the relationship between mind and behaviour with emphasis on the underlying physiological mechanisms. Implications for health are emphasised throughout the course. The subject encourages the student to evaluate the connections believed to occur between attitudes, behaviour, lifestyle, physiology, and health outcome. Lectures are complemented by practical workshops and discussion in tutorials.

91709

Pharmacology 2

8cp; 6hpw; prerequisite(s): 91707 Pharmacology 1
Semester offered: Spring
Offered at: City campus

This subject develops and extends the principles governing drug and xenobiotic action covered in 91707 Pharmacology 1. Objectives are to further develop the concept of receptors as cellular determinants of drug and xenobiotic action and to develop the concepts of modulated receptors and ion channels in determining anaesthetic drug action. The clinical efficacy of the major pharmacology drug classes used in the treatment of diabetes and respiratory and musculoskeletal systems disorders. Endogenous opioids in pain control mechanisms and the interaction of opioid analgesics with these systems. Selective toxicity in the treatment of microbial, viral and protozoal infections. Toxicokinetic factors, defence mechanisms, cellular reactivity, receptors and binding sites as determinants of target organ toxicity. Drugs in the conception and birthing process. Carcinogens and teratogens. Specific classes of toxic substances. Lectures are complemented by a tutorial/practical program which emphasises the clinical nature of the subject and develops lecture material using a variety of experimental tutorial, computer simulation and case-study approaches.

91775

MSc Thesis (FT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

For subject descriptions, refer to course entry.

91776

MSc Thesis (PT)

Semester offered: Autumn, Spring
Offered at: City, St Leonards campuses

For subject descriptions, refer to course entry.

91801

Foundations of Pilates Method 1

6cp
Semester offered: Autumn
Offered at: City campus

This subject is the first of two foundation subjects in the Pilates Method and introduces the study and practice of the Pilates Method. It includes the history, principles and philosophy of the Pilates Method along with selected applied anatomy and physiology of the human body, an understanding of movement ability and safe exercise principles and practice. It introduces the student to postural assessment procedures and some basic pathologies for safe exercise programming.

91802

Foundations of Pilates Method 2

6cp
Semester offered: Spring
Offered at: City campus

This subject is the second of two foundation Pilates Method subjects and completes the study and practice of Pilates Method. It is designed to apply knowledge of the principles and philosophy of the Pilates Method mastered in 91801 Fundamentals of Pilates Method 1 to exercise and movement. It incorporates a thorough understanding of movement ability, safe exercise principles, competent care and use of Pilates equipment to the application of ongoing assessment procedures and an understanding and awareness of any contra-indications for safe exercise programming. This subject also includes development of practical teaching skills required to instruct in the Pilates Method and an awareness of professional and ethical conduct that underpins professional practice.

91898

Professional Training (Pilates Method) 1

6cp
Semester offered: Autumn
Offered at: City campus

This subject incorporates practical application of theoretical knowledge acquired in the subject Foundations of Pilates Method 1. It firstly establishes the practical application of the Pilates Method exercise principles for the students themselves. Students are required to undertake personal Pilates sessions with a qualified practitioner of their choice to a total of 90 hours. Students are also required to undertake 100 hours of supervised professional practice in an accredited studio applying their theoretical knowledge and acquiring the necessary skills for the practice of Pilates *in situ*. This component is organised by the University in conjunction with the Australian Pilates Method Association.

91xxx

Professional Training (Pilates Method) 2

6cp
Semester offered: Spring
Offered at: City campus

This subject continues on from and completes the practical application of the Pilates Method established in 91898 Professional Training (Pilates Method) 1. All requirements are as for that subject.

91xxx

Pilates Method (Rehabilitation) 1

6cp; block mode
Semester offered: Autumn
Offered at: City campus

Any student interested in this subject should contact the Course Director, Denise Edwards:

email DA.Edwards@uts.edu.au

or consult the online handbook for the Faculty of Science at:

www.uts.edu.au/div/publications/sci/index.html

91xxx

Pilates Method (Rehabilitation) 2

6cp; block mode; prerequisitie(s): 91xxx Pilates Method (Rehabilitation) 1
Semester offered: Spring
Offered at: City campus

Any student interested in this subject should contact the Course Director, Denise Edwards:

email DA.Edwards@uts.edu.au

or consult the online handbook for the Faculty of Science at:

www.uts.edu.au/div/publications/sci/index.html

91xxx

Professional Practice (Pilates Rehabilitation) 1

6cp; block mode
Semester offered: Autumn
Offered at: City campus

Students undertake a minimum of 1,000 hours of supervised work placement in a UTS-accredited studio and personal sessions of at least 350 hours.

Any student interested in this subject should contact the Course Director, Denise Edwards:

email DA.Edwards@uts.edu.au

or consult the online handbook for the Faculty of Science at:

www.uts.edu.au/div/publications/sci/index.html

91xxx

Professional Practice (Pilates Rehabilitation) 2

6cp
Semester offered: Spring
Offered at: City campus

Students undertake a minimum of 1,000 hours of supervised work placement in a UTS-accredited studio and personal sessions of at least 350 hours.

Any student interested in this subject should contact the Course Director, Denise Edwards:

email DA.Edwards@uts.edu.au

or consult the online handbook for the Faculty of Science at:

www.uts.edu.au/div/publications/sci/index.html

95556

Technology, Society and Change

6cp; prerequisite(s): 48cp of a degree must be completed
A University-wide transdisciplinary subject
Semester offered: Autumn
Offered at: City campus

This subject examines and illustrates the interdependence and tensions between society, technology and change. It addresses the question of what is technology, and how this has influenced and has been influenced by social values and institutions.

Some of the following issues are looked at: How have many different societies valued and defined social justice? How are the tensions between technological and communal interests understood? How has technology been an instrument and product of society's struggle with power and control? How have different societies perceived progress? How have these perceptions shaped their past? How might they shape their future? How do different societies come to define and deal with risk? How have different societies valued and strived for the sustainability of life on earth? This subject provides an opportunity for students to recognise what new ways of thinking a transdisciplinary approach can offer. It also engages students in grappling with some of the tensions between discipline-specific discourses and transdisciplinary thinking.

98708

Risk Assessment and Management

6cp
Semester offered: n/a
Offered at: n/a

This subject provides an introduction to methods of risk assessment in an environmental context. An understanding of the concepts of risk perception, risk communication and risk acceptability is developed. Legal issues in risk management are also discussed. The subject is relevant to the modification or engineering of risks and has application to environmental management, impact assessment and auditing.

98711

Management of Coasts, Oceans and Catchments

6cp; availability: this subject alternates with 91118 Fisheries Resources and is next offered in 2003
Semester offered: Autumn
Offered at: St Leonards campus

This is a intermediate level undergraduate subject. It provides an overview of coastal policy and resources management, integrated coastal and ocean development and management, including selected regions, which are surveyed and assessed. Policies of national, State and local governments are critically examined and contrasted as appropriate with policies of overseas coastal nations. Constituency building is introduced with the associated tools necessary for coastal managers. The interdisciplinary nature of coastal resources, problems, conflicts and issues are highlighted.

99502

Foundations of TCM

6cp; a flexible teaching and learning subject
Semester offered: Autumn
Offered at: City campus

The theoretical and philosophical components of the subject have a continuing and progressive application in all aspects of Traditional Chinese Medicine. This subject provides a broad foundation for the traditional Chinese medical view of health, disease aetiology and diagnostic systems and principles of treatment, which are built upon throughout the training program. Pulse diagnosis, one of the cornerstones of the traditional Chinese diagnostic system, is included in this subject.

99536

First Aid Certificate Course

St John's Ambulance course or approved training organisation; note: this subject does not carry academic credit

Students must hold a current senior certificate in first aid, or equivalent qualification, before undertaking an internship in a clinic of the UTS College of Traditional Chinese Medicine as a 'student practitioner'.

99560

Introduction to TCM

6cp; 5hpw; corequisite(s): 99502 Foundations of TCM
Semester offered: Autumn
Offered at: City campus

This is an introduction to the basic theoretical concepts of Traditional Chinese Medicine (TCM) that provides an overview of the program and helps to bridge the gap between the biomedical and traditional Chinese approach to health. The subject offers foundation knowledge and skills for the practice of TCM. It provides the traditional physiology of the 12 organs and 14 major channels and is offered in a flexible learning format.

99563

Health Sciences 1

6cp; 6hpw
Semester offered: Autumn
Offered at: City campus

This subject provides an introduction to the anatomy and physiology of the healthy human body. Lectures are complemented by an appropriate practical program. The subject includes the following: the levels of organisation in the body; basic anatomy, anatomical terms, surface anatomy and body regions and overview of major organ systems; transport of materials across membranes, osmosis diffusion, active transport; the basic concepts of tissue and major organ systems; the general structure and functional significance of the major organ systems; basic microbiology and aseptic techniques; chromosomes, mitosis and meiosis, DNA, RNA; the structure, function and histology of the integumentary system, lymphatic and renal systems; and nutrition, enzyme action indigestion.

99564

The Physiology of *Qi*

4cp; a flexible teaching and learning subject; prerequisite(s): 99560 Introduction to TCM, 99502 Foundations of TCM
Semester offered: Spring
Offered at: City campus

This subject extends the student's knowledge of the *jing luo* (channel) system in relation to the clinical practice of acupuncture. It also provides an understanding, not only of how to balance energy, but of the mechanisms of energy production and methods of assisting this system of production – an important aspect of preventative therapy.

99567

Introduction to Chinese Herbal Medicine

6cp; 6hpw; prerequisite(s): 99560 Introduction to TCM, 99502 Foundations of TCM; corequisite(s): 99636 Essentials of Pathophysiology
Semester offered: Autumn
Offered at: City campus

This subject provides introductory information on the basic properties and functions of Chinese herbs and forms an essential foundation for an understanding of Chinese herbal formulae.

99570

Health Sciences 2

6cp; 6hpw; prerequisite(s): 99563 Health Sciences 1
Semester offered: Spring
Offered at: City campus

This subject completes the survey of healthy human anatomy and physiology begun in Health Sciences 1. Specifically, it examines the endocrine, nervous, reproductive and respiratory systems including concepts of control systems and system interactions within the body. It also completes an introduction to basic microbiological concepts of disease transmission, sterilisation and asepsis. This unit also examines chemical and physical concepts that underpin the bioscience component. These include chemical measurement, solutions, chemical reactions involving carbohydrates, lipids and proteins, pH and acid-base analysis along with the physical principles of gas pressure, temperature and flow, electricity and transmission of light and sound.

99579

Chinese Massage (*Tuina*)

6cp; workshops and clinical internship 6x13hrs (over two semesters); prerequisite(s): all subjects of Stage 4 of the TCM course
Semester offered: Spring
Offered at: City campus

The subject combines the acupressure techniques with general Chinese massage (*tuina*) techniques. It enables the student to assist the practitioner in the clinical situation where specific massage is required after the removal of needles to increase the effectiveness of acupuncture treatment.

99584

Clinical Features of Disease[1]

6cp; 4hpw; prerequisite(s): 99540 Pathophysiology B

This subject builds on the theoretical material offered in Anatomy and Physiology subjects. It also develops the student's ability to differentiate, in an acupuncture clinical setting, those conditions that should be referred to a medical practitioner or other health care professionals.

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1 This subject is no longer offered.

99590

Special Topics in TCM (Intermodal and Professional)[1]

8cp; 6hpw; prerequisite(s): 99585 Disease States

This subject acquaints the student with the current requirements of private Traditional Chinese Medicine practice. Workshops are provided in current research, bioethics and professional issues. The subject also encourages students to broaden their understanding of issues and techniques related to practice, to individually pursue areas of personal interest and research, and to see themselves as part of the wider health care community.

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1 This subject is no longer offered.

99591

Practice Management

4cp; 3hpw
Semester offered: Spring
Offered at: City campus

This subject emphasises the need for proper planning in the management of a small business. Issues such as professionalism, location, record keeping, taxation, insurance, advertising, multidiscipline practices and legal requirements are examined.

99594

Chinese Herbal Practice 1

6cp; flexible learning program; prerequisite(s): all TCM units of Stage 2
Semester offered: Autumn
Offered at: City campus

Chinese herbal medicine involves the diagnosis of specific disorders and the discrimination of variations within these diagnosed disorders. Students are trained in the selection and formulation of individual herbal prescriptions appropriate to the patient's individual presenting symptoms. This subject provides the student with practice in analysing the presentation of various disorders, especially pulmonary and gastro-intestinal conditions.

99596

Chinese Herbal Practice 2

6cp; flexible learning program; prerequisite(s): all TCM units of Stage 3
Semester offered: Spring
Offered at: City campus

Chinese herbal medicine involves the diagnosis of specific disorders, and the discrimination of variations within these diagnosed disorders. This subject builds on work undertaken in 99594 Chinese Herbal Practice 1.

99597

Graduate Clinic Internship (CHM)

5cp; graduate internship: 25 hours as a supervised practitioner; prerequisite(s): all units of Stage 3; corequisite(s): all units of Stage 4
Semester offered: Spring
Offered at: City campus

The graduate herbal clinician undertakes 25 hours of supervised practice in the UTS Chinese herbal clinics.

99599

Principles of Chinese Herbal Medicine

8cp; flexible learning program
Semester offered: Autumn
Offered at: City campus

This subject offers foundation knowledge and skills for the practice of Chinese herbal medicine. As a graduate subject it is predicated by an extensive knowledge of Traditional Chinese Medical theory. It provides an introduction to the basic concepts of Chinese herbalism and its application.

99612

Principles of Chinese Herbal Prescription

6cp; flexible learning program; prerequisite(s): all TCM units of Stage 2
Semester offered: Spring
Offered at: City campus

This subject analyses the Chinese herbal formulae utilised to treat illness. In this subject the major herbal formulae are evaluated, together with their appropriate application. Students are encouraged to discriminate between various treatment strategies.

99613

Principles of Pharmacology in Chinese Medicine

6cp; lecture/tutorials and workshops program; prerequisite(s): all subjects of Stage 1
Semester offered: Spring
Offered at: City campus

In this subject students undertake an integrated course, which includes strands in botany, pharmacognosy, and pharmacology of Chinese medical herbs. This subject relates to the specific area of Chinese herbs, examining the action of the active constituents of herbs, the toxicity of certain formulae and their synergic effects in medicinal use.

99614

Classics of Chinese Herbal Medicine

4cp; flexible learning program; prerequisite(s): all subjects of Stage 2
Semester offered: Autumn
Offered at: City campus

This subject evaluates the guiding principles of Shang Han Lun, Jin Kui Yao Lue and Pi Wei Lun. These guiding principles are the basis of Traditional Chinese Medicine practice nowadays. Selected chapters are discussed to illustrate the important messages relevant to modern Chinese herbal medicine.

99615

Graduate Clinic Level 2 (CHM)

3cp; Graduate Clinical Assistant Level 2: 15 hours (total); prerequisite(s): all subjects of Stage 2
Semester offered: n/a
Offered at: n/a

Clinical training is continued under the guidance of an experienced practitioner at the clinics of the UTS College of Traditional Chinese Medicine. This subject is especially directed towards providing the student with confidence to undertake a full internship in the following semester.

99616

Clinical Theory and Clinic

This subject has been replaced by 99642 Clinic Theory and Clinic Level 1 (Autumn semester) and 99643 Clinic Theory and Clinic Level 2 (Spring semester).

99617

Point Location 1

8cp; 6hpw; prerequisite(s): all units of Stage 1; corequisite(s): 99564 The Physiology of *Qi*
Semester offered: Spring
Offered at: City campus

This subject deals with the location, depth, action, special precautions and contra-indications of the major points used in clinical practice. This module of point location complements the knowledge of point function provided in 99560 Introduction to TCM and 99564 The Physiology of *Qi*. The module in anatomy provides a basis for the accurate location of points, and the module that introduces acupressure and basic treatment techniques provides practical experience.

99618

Chinese Diagnostic System 1

6cp; 5hpw; prerequisite(s): 99560 Introduction to TCM, 99502 Foundations of TCM
Semester offered: Autumn
Offered at: City campus

This subject provides a deeper understanding of the objectives, application and therapeutic conclusions inherent in the Traditional Chinese diagnostic system. It provides practical workshops in advanced pulse diagnosis that compliments students' theoretical work.

99619

Clinic – Level 2 and Point Location 2

This subject has been replaced by 996xx Clinic Theory and Clinic Level 3 (Autumn semester) and 99645 Clinic Theory and Clinic Level 4 (Spring semester)

99620

History and Philosophy of TCM

4cp; 4hpw; prerequisite(s): 99502 Foundations of TCM
Semester offered: Spring
Offered at: City campus

This subject studies the development of Traditional Chinese Medicine (TCM) in the west as well as the theoretical structure of TCM and its influence upon the holistic approach to healing and preventative therapy. It focuses on some of the more complex theories arising from classical literature and the ethics, both ancient and modern, that are imbedded in the practice of TCM.

99621

Chinese Diagnostic System 2

6cp; 6hpw; prerequisite(s): 99618 Chinese Diagnostic System 1; corequisite(s): 99620 History and Philosophy of TCM
Semester offered: Spring
Offered at: City campus

This subject contributes a large component of the essential skills and knowledge that are required for traditional Chinese diagnosis. The subject and workshops underpin, not only the clinical experiences of the student, but also the differentiation of disease states when biomedical and Chinese medical systems are integrated.

99622

Pharmacology of Traditional Chinese Medicine

6cp; 4hpw; assumed knowledge: 99539 Pathophysiology A[1] or 99636 Essentials of Pathophysiology
Semester offered: Spring
Offered at: City campus

This subject examines the principles of pharmacotherapy with specific emphasis on western drugs which affect the cardiovascular, respiratory, renal and nervous systems. It examines the pharmacology of Chinese herbs and covers up-to-date scientific knowledge of commonly used herbal products and scheduled herbs, including botanical description, active constituents, pharmacological action, toxicity, therapeutic uses and TGA regulatory status.

[1] This subject is no longer offered.

99623

Chinese Herbal Formulae

8cp; 6hpw; prerequisite(s): all Stage 2 TCM subjects
Semester offered: Autumn
Offered at: City campus

Chinese herbal medicine utilises herbal combinations to treat illness. In this subject, the major herbal formulae are evaluated together with their appropriate application. Students are encouraged to discriminate between various treatment strategies.

99624

Clinical Theory and Clinic Level 3

This subject has been replaced by 99646 Clinic Theory and Clinic Level 5 (Autumn semester) and 99647 Clinic Theory and Clinic Level 6 (Spring semester).

99625

Research Methods

6cp; 6hpw
Semester offered: Spring
Offered at: City campus

This subject is an introduction to the scientific method and its importance to the Traditional Chinese Medicine profession. It deals with basic research issues: theories and models; independent, dependent and confounding variables; and the influence of the placebo effects. It also examines the philosophical basis of positivist, empiricist and analytical approaches to scientific endeavours.

99626

Microsystems and Advanced Treatment Techniques

8cp; 8hpw; prerequisite(s): all TCM subjects of Stage 6
Semester offered: Spring
Offered at: City campus

The theoretical information provided by the subject is applied and practiced in the subject's workshops on advanced treatment techniques. Much of the information contained in these units is applicable to the treatment of sports injuries, pain control and paralysis.

99627

Clinical Practicum

8cp; 6hpw; prerequisite(s): all TCM subjects of Stage 5; corequisite: all TCM subjects of Stage 6
Semester offered: Spring
Offered at: City campus

In the final year of training the student is responsible for patient care, treatment and clinical management under the supervision of a practitioner. This subject prepares the student for this increased degree of clinical responsibility, as well as integrating material and skills previously studied.

99628

Disease States

This subject has been replaced by 99637 TCM Disease States 1 (Autumn semester) and 99638 TCM Disease States 1 (Spring semester).

99629

Chinese Medical Classics

4cp; 3hpw; prerequisite(s): 99620 History and Philosophy of TCM
Semester offered: Autumn
Offered at: City campus

Traditional Chinese Medicine (TCM) is firmly based on a 2000-year-old body of classical medical writing. This subject examines some of the major landmark texts of TCM that are still relevant to today's practitioners. The interpretation of such ancient writings is the study of a lifetime but this subject introduces the student to the original writings on many aspects of TCM theory with which they are already familiar.

99630

Clinical Practice 1

12cp; 250 hours of supervised clinical practice and development of clinical reasoning skills; prerequisite(s): satisfactory completion of all Stage 1–6 subjects
Semester offered: Autumn
Offered at: City campus

The student experiences the full range of practitioner responsibilities under the supervision of a clinical manager. This area of training is accomplished in the outpatient clinics of the UTS College of Traditional Chinese Medicine, which provide low-cost Traditional Chinese Medicine services to the public.

99631

Clinical Practice 2

12cp; 250 hours of supervised clinical practice and development of clinical reasoning skills; prerequisite(s): satisfactory completion of all Stage 1–6 course subjects
Semester offered: Spring
Offered at: City campus

The student experiences the full range of practitioner responsibilities under the supervision of a clinical manager. This area of training is accomplished in the outpatient clinics of the UTS College of Traditional Chinese Medicine, which provide low-cost Traditional Chinese Medicine (TCM) services to the public. The student also has the option of undertaking a TCM internship in China with a UTS-approved institution.

99632

Graduate Clinic Level 1 (CHM)

4cp; Graduate Clinical Assistant Level 1: 10 hours, dispensing workshop 2 x 4; prerequisite(s): 99599 Principles of Chinese Herbal Medicine
Semester offered: Autumn, Spring
Offered at: City campus

Students complete a workshop program that enables them to undertake basic herbal dispensing in the UTS clinic. Clinical training is provided through the clinical program of the UTS College of Traditional Chinese Medicine at the specialist Traditional Chinese Medicine centre provided by the University, which is open to the general public.

99636

Essentials of Pathophysiology

6cp; prerequisite(s): 99563 Health Sciences 1 and 99570 Health Sciences 2; or 91701 Medical Science 1 and 91702 Medical Science 2
Semester offered: Autumn
Offered at: City campus

This subject aims to provide an overview of the essential elements of the disease process as occurring in some common disorders of each of the major body systems. This information is provided in the context of how the disorder affects healthy structure and function, and so reinforces basic anatomy and physiology previously studied. Topics include immunology, cancer, endocrine, gastrointestinal, respiratory cardiovascular, kidney and body fluid, nervous, musculo-skeletal and reproductive disorders.

99637

TCM Disease States 1[1]

4cp; 4hpw; assumed knowledge: all TCM and Biomedical subjects; corequisite(s): 99630 Clinical Practice 1
Semester offered: Autumn
Offered at: City campus

The subject moves its emphasis from the 'learning' of TCM to the clinical practice of TCM. After determining that TCM is appropriate to the patient's condition, the student must then differentiate the pattern of disharmony as identified in Traditional Chinese Medicine, decide on the treatment principle and devise a course of treatment.

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1 This subject replaces the Autumn semester of 99628 Disease States.

99638

TCM Disease States 2[1]

4cp; 4hpw; assumed knowledge: all TCM and Biomedical subjects including 996XX TCM Disease States 1; corequisite(s): 99631 Clinical Practice 2
Semester offered: Spring
Offered at: City campus

The subject extends the previous learning in the subject Disease States 1. Additional diseases are studied in context of TCM requiring the student to differentiate, and treat using both acupuncture and Chinese herbal medicine.

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1 This subject replaces the Spring semester of 99628 Disease States.

99642

Clinic Theory and Clinic Level 1[1]

4cp; 2hpw; lectures, demonstrations, workshop and clinical observation sessions; Clinical Assistant Level 1: 25 hours; corequisite(s): 99502 Foundations of TCM, 99617 Point Location 1, 99563 Health Sciences 1 (TCM)
Semester offered: Autumn
Offered at: City campus

Approximately 30 per cent of the undergraduate training program is devoted to gaining clinical experience in preparation for becoming a qualified TCM practitioner. This subject prepares the student for the role of clinical assistant and introduces them to the clinical environment in the UTS teaching clinics.

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1 This subject replaces the Autumn semester of 99616 Clinical Theory and Clinic.

99643

Clinic Theory and Clinic Level 2[1]

4cp; 2hpw; workshop and clinical observation sessions; Clinical Assistant Level 2: 25 hours; prerequisite(s): 99642 Clinic Theory and Clinic Level 1; corequisite(s): 99502 Foundations of TCM, 99570 Health Sciences 2
Semester offered: Spring
Offered at: City campus

This subject introduces and provides practical experience in basic acupuncture treatment techniques. The subject builds on previous clinical training subjects and acquaints the student with the skills and duties required to be a 'student practitioner' working in the University's outpatient clinics. Clinical training is continued through the clinical program of the UTS College of TCM.

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1 This subject replaces the Spring semester of 99616 Clinical Theory and Clinic.

99644

Clinic Theory and Clinic Level 3[1]

4cp; Clinical Assistant Level: 40 hours; practicums: 13x2 hours; prerequisite(s): all subjects of Stage 2; corequisite(s): 99636 Essentials of Pathophysiology, 99618 Chinese Diagnostic System 1
Semester offered: Autumn
Offered at: City campus

Clinical training is continued in the College of Traditional Chinese Medicine clinics. Basic needling skills such as needle insertion and manipulation are also introduced during the practicums.

1 This subject replaces the Autumn semester of 99619 Clinic – Level 2 and Point Location 2.

99645

Clinic Theory and Clinic Level 4[1]

4cp; Clinical Assistant Level: 40 hours; practicums: 13x2 hours; prerequisite(s): all subjects of Stage 3; corequisite(s): 99621 Chinese Diagnostic System 2
Semester offered: Spring
Offered at: City campus

Clinical training is continued in the College of Traditional Chinese Medicine clinics. Knowledge of point location is revised and expanded.

1 This subject replaces the Spring semester of 99619 Clinic – Level 2 and Point Location 2.

99646

Clinic Theory and Clinic Level 5[1]

6cp; Clinical Assistant Level 6: 60 hours; prerequisite(s): all units of Stage 4; corequisite(s): 99584 Clinical Features of Disease, 99623 Chinese Herbal Formulas
Semester offered: Autumn
Offered at: City campus

This module builds on the first two years of theoretical, practical and clinical training and acquaints the student with skills and duties required by a 'student-practitioner' working in the University's outpatient clinic. Clinical training is continued through the clinical program of the College of TCM.

1 This subject replaces the Autumn semester of 99624 Clinical Theory and Clinic – Level 3.

99647

Clinic Theory and Clinic Level 6[1]

6cp; 2hpw; workshops, tutorials and planning sessions: Clinical Assistant Level 6: 60 hours; prerequisite(s): all units of Stage 5, corequisite(s): 99627 Clinical Practicum
Semester offered: Spring
Offered at: City campus

This module builds on the first three years of theoretical, practical and clinical training and acquaints the student with skills and duties required by a 'student-practitioner' working in the University's outpatient clinic. Clinical training is continued through the clinical program of the College of TCM.

1 This subject replaces the Spring semester of 99624 Clinical Theory and Clinic – Level 3.

99661

Honours Project (TCM) 1

24cp; prerequisite(s): completion at Credit level of the four-year degree in TCM or equivalent
Semester offered: Autumn, Spring
Offered at: City campus

This is an area of self-determined study. The Honours research project provides students with the opportunity to extend their knowledge under the guidance of a suitably qualified member of academic staff and to establish a foundation for the development of their professional research and research reporting skills.

99662

Honours Project (TCM) 2

24cp; prerequisite(s): completion at Credit level of the four-year degree in TCM or equivalent; 99661 Honours Project (TCM) 1
Semester offered: Autumn, Spring
Offered at: City campus

For subject description, refer to 99661 Honours Project (TCM) 1.

SUBJECTS OFFERED BY OTHERS

21082

Small and Medium Enterprise Management

6cp
Undergraduate

This subject creates knowledge and analytical skills through applied research and involvement in the process of managing a small and medium enterprise venture in the contemporary business environment. Students collaborate with selected industry practitioners on an industry-based research project. This enables students to acquire the basic competencies necessary for entry into a career in new venture/small and medium business management. Students learn to appreciate the major ingredients in small and medium enterprise success, and the special problems small and medium enterprises may encounter.

21126

Capstone Project in Business Planning

6cp; prerequisite(s): all foundation core (48 credit points) and disciplinary theme subjects (72 credit points) of the Innovation degrees offered by the Faculties of Science, Engineering and Information Technology only
Undergraduate

This is a core subject in the ëInnovationí degrees and provides a linking function to the four Technology Innovation and Science Specialisations. It draws together the two key themes of innovation and entrepreneurship as they are developed and practiced within the respective specialisations. It provides an applied context for integrating business and disciplinary skills and competencies in the creation, initiation, implementation and operation of a range of science, bio-engineering, engineering, and information technology-related business innovations. Students work in small teams located in situ with host companies to produce a business plan for the commercialisation of a scientific or technical idea or venture, which is assessed by experts in the respective fields of application. Students develop innovative, entrepreneurial, communicative and interpersonal skills in obtaining expert advice from scientists, engineers, designers, business people and venture-capitalists in the development of their business plans.

21129

Managing People and Organisations

6cp
Undergraduate

This subject introduces students to the fundamentals of management and organisational behaviour in the context of today's contemporary global business environment. It examines the major theories and models in areas of communication, group dynamics, individual behaviour and motivation, decision making, leadership, power and politics, and ethics and social responsibility. It places particular emphasis on the application of theory to dilemmas and issues likely to confront managers today and in the future.

21131

Business Process Management

6cp
Undergraduate

This subject raises awareness of the need to efficiently and effectively manage business processes. Students develop an understanding of how to manage business processes through examining and assessing the wide range of techniques and tools that have been developed to assist in this and related decision making. The subject provides a scientific basis for solving business process problems and improving the performance of business processes. The emphasis in this subject is practical rather than theoretical. Students gain an awareness of contemporary approaches to organisational design and change, and the opportunities provided by modern information and communications technologies in achieving competitive advantage.

21193

Introduction to Corporate Strategy

6cp; prerequisite(s): 22107 Accounting for Business; 25115 Economics for Business; 21129 Managing People and Organisations; 24108 Marketing Foundations
Undergraduate

This subject introduces students to the concept and process of strategic analysis and decision making. It provides students with competencies, skills and the understanding necessary for implementing and managing the strategy process which aims to ensure the long term viability and success of an enterprise. Thus students can more readily understand, communicate and materially contribute to the purpose of the organisation. The subject gives participants an understanding of the contemporary business environment in which business operates and how decision-making processes, leadership and organisational politics impact on the strategic activities of managers.

21227

Innovation and Small Venture Management

6cp
Undergraduate

This subject gives students an understanding of the contemporary business environment in which new ventures are created and in which small business operates. By developing a business plan for a new venture and from discussions with small business operators, students gain an understanding of the skills necessary for success. They are thus better equipped to start and run a small business or deal with entrepreneurs and small business owners in a consulting capacity.

21306

Employment Relations in the Global Context

6cp; prerequisite(s): 21129 Managing People and Organisations
Undergraduate

This subject introduces the theories, issues and practices involved in the management of employment relations within an increasingly competitive global market. As well as gaining a broad understanding of the context and nature of different systems of international employment relations, students are encouraged to explore the cross-national similarities and differences between Australia and its geographical neighbours and trading partners through the completion of case studies and the research of current literature on the topic. The subject exposes students to the human resources policies and practices of multinational corporations, and explores how they are utilised for competitive advantage.

21440

Management Skills

6cp; prerequisite(s): 21129 Managing People and Organisations
Undergraduate

This subject develops an understanding of the nature of intrapersonal and interpersonal competencies and their relevance to management practice in contemporary organisations. It explores behavioural skill learning in order to establish a platform for continued development on the part of the student. Cultural and gender issues are also explored in this context.

Topics covered include the nature of intrapersonal and interpersonal competence; theoretical underpinnings of behavioural skills learning; self-management skills; basic interpersonal communications skills; assertion and influence skills; and the applied skills of small group management, presentation, negotiation and conflict resolution, interviewing, networking and leadership.

21717

International Management

6cp
Postgraduate

This subject encourages participants to study how people in other countries go about conducting business and managing their enterprises; ascertain the reasons behind their various management practices; assess their effectiveness; and determine the implications for Australian managers. The subject helps develop an integrated world view to provide a better basis for decision making within the international business arena.

21718

Organisation Analysis and Design

6cp; prerequisite(s): four years' work experience
Postgraduate

This subject develops skills in organisational analysis. It also develops diagnostic and prescriptive skills in regard to organisations and focuses on the description and analysis of organisations as formal structures, political systems and cultural entities.

21720

Employment Relations

6cp; prerequisite(s): four years' work experience
Postgraduate

This subject presents an introduction to the areas of industrial relations and human resource management. Topics covered include historical steps in the development of the human resource function and the forces that have shaped its development; major functions of employment relations managers; the relationship between the human resource and industrial relations functions in the modern organisation; the nature of industrial relations and the contribution to understanding made by several conflict theorists; the structure and functioning of formal industrial relations; the form and function of the employer and employee organisations, parties to employment relations; and the nature of efficiency restructuring and enterprise bargaining and their impact upon the management of employment relations.

21724

Human Resource Management

6cp

Postgraduate

This subject develops the ability to locate, critically analyse and explain the relevance of the recent literature in key areas of Human Resource Management (HRM). It emphasises strategic models of HRM, and the links between HRM and recent trends in management theory and practice.

21725

Organisational Change and Adaptation

6cp

Postgraduate

This subject develops an understanding of strategies, methodologies, and intervention techniques and skills in managing planned or adaptive organisational change. It consists of two components – a knowledge component and a skills component. The former is presented through normal lecture discussions. The skills component is covered through group involvement in an ongoing or potential organisational change problem, through which a group acts as a team of change agents. The results of their efforts are presented in a two-day non-residential workshop at the end of the semester.

21728

Public Sector Management

6cp

Postgraduate

This subject introduces students to the theory and practice of public sector management. It explores the competing theories about management in the public sector, and examines practical management skills in the public sector in the light of these competing theories.

21741

Operations Management

6cp

Postgraduate

Operations management is about the way organisations produce goods and services. Everything we buy, eat, read and wear has to be produced. Every service we receive from hospitals, banks, local government, the local cinema, etc., has to be produced. This subject provides a broad introduction to planning, design, implementation and improvement of operations. Topics covered include operations strategy; various approaches to operations planning and control; quality management; performance measurement; supply chain management; and operations improvement. Teaching methods include case studies and a hands-on simulation exercise.

21742

Quantitative Management

6cp

Postgraduate

This subject provides an introduction to the application of operations research and mathematical modelling techniques to the solution of business problems. The practical application of the various techniques is stressed. Hands-on experience is gained through the use of computer software packages. Topics covered include a revision of basic statistics; project management (CPM/PERT); decision models; simulation techniques; linear programming; statistical quality control; game theory; and inventory management.

21743

Quality Management Systems

6cp

Postgraduate

This subject develops an understanding of the practical and managerial aspects of quality, including the fundamentals of Total Quality Management and its relationship to productivity and organisational performance. Topics include the fundamentals of quality, productivity, and organisational performance; Total Quality Management; traditional concepts and modern definitions of quality; quality management tools and techniques; quality standards; and performance measurement.

21744

Materials Management

6cp
Postgraduate

This subject presents a strategic approach to production planning and control. Topics include a framework for the analysis of production planning and control systems; different approaches to production planning and control, e.g. time-phased (MRP), JIT, ROP, TOC; a strategic approach to the selection of production planning and control systems; integrating MRP and JIT; implementation issues; shop-floor scheduling techniques; benchmarking for performance measurement; and developments in EFI and their likely impact on production planning and control systems.

21745

Service Operations Management

6cp
Postgraduate

This subject covers the management of the design, production and delivery of services, and the application of operations concepts and methods to service situations. Topics include strategic management and marketing, process analysis, and delivery systems; establishing, measuring and control of service levels; location and layout; capacity planning; quality assurance; organisational behaviour and design in services; and managing professional services.

21751

Management Research Methods

6cp
Postgraduate

This subject contributes to the students' vocational and professional competencies by giving training in the analytic and research skills that can be applied to the solution of problems encountered in their professional lives. It provides the necessary expertise in research methodology for the project-based subjects which are a part of the students' postgraduate programs. Topics include survey research, experiments and quasi-experiments, case studies, content analysis and interviews.

21784

Global Business Competitive Intelligence

6cp
Postgraduate

Business or competitive intelligence is increasingly used by firms seeking to improve their ability to compete globally. Traditional management information systems are often unable to keep track of global opportunities and threats, or else provide so much information that decision makers are overwhelmed. Business and competitive intelligence is an important aspect of strategic planning. As such, it draws on, develops and applies concepts from a number of disciplines.

21797

Managing the Supply Chain

6cp
Postgraduate

Strategic supply chain management introduces a dynamic, revitalised organisation function presently enjoying a worldwide revival as a key element of competitive advantage. This subject introduces a range of sophisticated concepts of purchasing and materials management. Relevant to the private, public or nonprofit sectors, this subject covers a wide range of supply chain management activities including formation and management of strategic alliances, buyer selection and management, global sourcing, ethics in contracting situations and applications of information technology in supply chain management.

21813

Managing People

6cp; prerequisite(s): four years' work experience
Postgraduate

This subject uses a behavioural science theory and research perspective to diagnose organisational processes. Students learn to apply behavioural science ideas to analyse individual performance issues and organisational processes in the management of human performance at work; relate people management practices to developments in management thought and to changing values in the world of business and administration; critically evaluate the major theories and models that have been developed to explain individual, group and inter-group behaviour in work organisations; and appraise organisational communication practices in the context of organisational diversity.

The subject provides an introduction to the field of people management; basic individual psychology; motivation, job design and performance management; managing groups at work; self-managing work teams; intergroup behaviour and conflict in organisations; leadership; behavioural aspects of decision making; and communication for people management.

21832

Managing for Sustainability

6cp

Postgraduate

This subject provides students with a framework for incorporating the natural environment into business strategies and practices. It provides an opportunity to systematically understand business-environment relationships and integrate concepts and techniques from disciplines ranging from operations management to environmental sociology. It provides a unique set of skills for future managers to transform environmental challenges into business opportunities.

21833

Strategic Management of the Global Workforce

6cp

Postgraduate

This subject focuses on issues relating to the management of a global flexible workforce, specifically strategic international dimensions of human resource management (HRM). Topics include the strategic link between international business and international HRM; theories of strategic international HRM; strategy, structure and the people management function; contemporary issues in international HRM; expatriate management; and critical evaluation of the international HRM function. Particular emphasis is placed on the management of expatriates in new organisational forms, e.g. networks and joint ventures.

21835

Human Resource Management Practices

6cp

Postgraduate

This subject examines key human resource management (HRM) functions and processes from the perspectives of the multiple stakeholders in the employment relationship. It develops specific HRM knowledge and skills in workforce planning; job analysis; position descriptions; staffing; training and development; performance management; and remuneration management. It also develops a critical perspective to the strategic function of HRM in the strategic management process.

21854

Innovation and Entrepreneurship

6cp

Postgraduate

This subject presents students with a perspective on new, small and innovative enterprise in comparison with the traditional large, bureaucratic and conservative organisation. An understanding of innovation and new venture creation is provided. Students gain an appreciation of the challenges and problems of small business and develop the skills valuable for a career in small to medium enterprises.

21856

Career and Portfolio Development

6cp

Postgraduate

This subject assists students to review learning and plan career paths for themselves and for the people they manage and supervise. It provides the theoretical and practical frameworks for students to integrate their credentialed and uncredentialed learning into a cohesive portfolio that positions them optimally for career choices in the sector. It enables students to identify gaps in their repertoire of knowledge and skills, which can then be addressed within the industry-training program.

22107

Accounting for Business

6cp

Undergraduate

In most economies business success is measured in financial terms. It is the accountants who undertake this measurement. Many decisions in business are made based on accounting information, both historical (based on past events) and projected (based on estimates of the future). Understanding accounting as a systematic way of measuring and communicating financial information on the financial status of various business entities is the foundation for any successful career in both the private and public business sectors.

22566

Accounting for Small Business 1

6cp
Undergraduate

This subject develops the knowledge and skills required by accountants in dealing with the problems which are unique to their professional work in the small business sector. It highlights and emphasises the practical matters associated with the initiation and growth of a small business.

Topics covered include an overview; the requirements of establishing a business – the steps and structures; economic business cycles' growth and future; acquiring and/or financing the business; accounting – records, control, costing and pricing; financial analysis and management; appraisals and acquisitions; the growing trend towards franchising as a form of small business; taxation and tax planning; insurance and risk; business disaster planning and recovery; and business and financial planning and budgeting.

24108

Marketing Foundations

6cp
Undergraduate

This subject covers the basic principles of marketing. It develops an understanding of the overall process of marketing planning, implementation and control in the contemporary business environment and also develops a basic understanding of marketing information systems; market research and marketing ethics; market segmentation; buyer behaviour; product development; and the development of product, distribution, promotion and pricing strategies for both goods and services domestically and internationally.

24307

Electronic Business

6cp; prerequisite(s): 24108 Marketing Foundations
Undergraduate

This subject introduces students to emerging electronic business environments. It presents an overview of the technological elements of electronic environments using the Internet as an exemplar for emerging electronic business initiatives within the World Wide Web. It emphasises the ways in which organisations are rethinking their building of customer relationships and explores, at an introductory level, the legal, social and organisational issues related to the development of virtual communities and corporations within emerging electronic environments.

25115

Economics for Business

6cp
Undergraduate

This subject develops an understanding of basic economic principles and their application to business decision making and business strategy. It provides a foundation for further studies in business, economics and finance. It provides students with the ability to read and understand analyses presented in the financial and business media and be able to effectively participate in the formulation of business strategies.

25300

Fundamentals of Business Finance

6cp; prerequisite(s): 22107 Accounting for Business; 25115 Economics for Business; corequisite(s): 26133 Business Information Analysis
Undergraduate

This subject introduces students to the concepts of financial management and the main approaches to solving financial problems of the firm. Topics include financial markets; introduction to foreign exchange risk; introduction to futures and options; capital budgeting; financing decisions and working capital management. It develops skills in searching for financial information via the web and the use of computer packages such as Excel.

25410

Corporate Financial Analysis

6cp; prerequisite(s): 22207 Accounting Transactions and Business Decisions; 25300 Fundamentals of Business Finance
Undergraduate

This subject examines the use of financial statements in assessing a firm's financial 'health', its strengths, weaknesses, recent performance and future prospects. It examines financial statement forecasting and modelling with an emphasis on cash-flow reconstructions from financial statements. Special issues dealing with financial statement information are emphasised in some depth. These issues include market efficiency, asset pricing, corporate restructuring and business valuation, debt ratings and financial distress.

25556

The Financial System

6cp; prerequisite(s): 25300 Fundamentals of Business Finance
Undergraduate

The aim of this subject is to develop an understanding of the operations of a modern financial system, covering its payment, financing and market-risk management activities. Its main topic areas are financial institutions, financial markets (such as stocks, bonds and foreign exchange) and derivatives (such as futures and options). It should be taken before enrolling in subjects such as 25503 Investment Analysis and 25620 Derivative Securities.

25559

New Start Financing and Valuation

6cp; prerequisite(s): 25300 Fundamentals of Business Finance
Undergraduate

This subject introduces students to the concepts of entrepreneurship and explores the practical issues facing a new company as it develops and grows. Topics include the funding options for new businesses, the valuation of such firms and the sources of advice and assistance that are available to the new business owner/manager.

25606

Financial Time Series

6cp; prerequisite(s): 25906 Portfolio Theory and Investment Analysis (Advanced); 25905 Capital Budgeting and Valuation (Advanced)
Undergraduate

A number of theoretical models have been developed in the area of corporate finance. Students have been exposed to the major models in preceding subjects. This subject investigates the techniques that are required to empirically test these models and conducts a number of empirical tests using Australian financial markets data.

25620

Derivative Securities

6cp; prerequisite(s): 25556 The Financial System; corequisite(s): 25503 Investment Analysis
Undergraduate

This subject provides students with a basic understanding of forwards, futures, swaps and options. It covers their valuation by arbitage arguments, their use and the management of the associated risks. A large part of this subject is devoted to applied problems dealing with situations in which students may expect to encounter derivations in practice.

25905

Capital Budgeting and Valuation (Advanced)

6cp; prerequisite(s): 25906 Portfolio Theory and Investment Analysis (Advanced); 25620 Derivative Securities; 25556 The Financial System
Undergraduate

This subject presents the technical tools to master capital budgeting and valuation. Both the traditional and the real-options viewpoint is presented. The theory of the financing and investment decisions of the firm is also discussed and empirical evidence and applications are considered.

25906

Portfolio Theory and Investment Analysis (Advanced)

6cp; prerequisite(s): 35102 Mathematics 2; 25300 Fundamentals of Business Finance
Undergraduate

This subject introduces students to the theory and practice of modern portfolio theory and its application to investment analysis at a technically advanced level. The subject introduces the foundations of investment decision making under certainty and uncertainty, utility theory and portfolio selection via the mean-variance approach. The capital asset pricing model and the arbitrage-pricing model are also developed. The empirical testing of these equilibrium pricing models is discussed.

25921

Theory of Financial Decision Making

6cp; prerequisite(s): admission to the Honours program
Undergraduate

This subject introduces the foundations of modern portfolio theory and how it is applied. Topics covered include: theory of choice; mean-variance criterion; capital market equilibrium; Capital Asset Pricing Model and Arbitrage Pricing Theorem; and equilibrium evaluation of derivative securities.

25923

Derivative Security Pricing

6cp; prerequisite(s): admission to the Honours program
Undergraduate

This subject provides the techniques needed to analyse and price derivative securities and to understand some of the key associated quantitative arguments. Topics include: derivative securities; arbitrage arguments; geometric Brownian motion model of asset prices; Ito's lemma; risk-neutral pricing; Black Scholes option pricing model; currency, index and futures options; hedging techniques; and interest rate derivative securities.

26133

Business Information Analysis

6cp
Undergraduate

This subject introduces students to emerging electronic business environments and the role of quantitative analysis within this context. An overview of the business implications of electronic environments is presented, with emphasis on the Internet and the World Wide Web. It examines the processes of business knowledge creation and management, and the use and application of quantitative analytical techniques to qualify, support, select and evaluate data as information for business decision-making.

27126

Leisure in Australia

6cp
Undergraduate

This subject provides students with the opportunity to investigate and account for the leisure patterns of Australians. It builds a framework for analysing the development of 'industrial' responses to this behaviour and provides a grounding on which subsequent contextual knowledge is built later in the course. It provides students with the opportunity to learn a range of information retrieval and reporting techniques central to the development of scholarship.

27184

Introduction to Tourism Systems

6cp
Undergraduate

This subject analyses the essential elements of tourism in terms of their functional, structural, operational and interrelational attributes, and examines the nature of the interrelationships between tourism and the significant environments with which it interacts. It provides students with knowledge and understanding of the specific and general contexts within which management in, and management of, tourism are practised.

27185

Introduction to Tourist Behaviour

6cp; prerequisite(s): 27184 Introduction to Tourism Systems
Undergraduate

This subject introduces conceptual and methodological approaches to the study of tourist behaviour. It seeks to develop an understanding of the relationships that exist between tourists and the various environments – social, cultural and physical – with which they interact. It discusses various approaches to managing tourist behaviour. Content is largely based on contributions from social psychology and environmental psychology with input from the other social sciences.

27216

Leisure Services Management

6cp; prerequisite(s): 21129 Managing People and Organisations
Undergraduate

This subject provides an understanding of the management issues emanating from the special nature of service industries; examines the role and importance of leisure services in a contemporary society, and the economic implications arising therefrom; and explores the different perspectives on the quality of service operations and their respective applications to leisure services.

27306

Marketing of Leisure Services

6cp; prerequisite(s): 24108 Marketing Foundations
Undergraduate

This subject develops a comprehensive awareness of marketing in the leisure environment. It gives students the opportunity to develop applied skills in the construction of a marketing plan and the management of the marketing mix in the leisure industry.

27316

Leisure and Fitness Centre Operations

6cp
Undergraduate

This subject provides students with a basic understanding of the operational requirements, issues and evaluation methods involved in leisure and fitness centre management. It is of interest to those students aiming to pursue careers in sports administration and commercial leisure services.

27523

Leisure and Tourism Planning

6cp
Undergraduate

This subject examines the various forms of planning interventions as they apply to leisure and tourism, specifically State environmental planning legislation and practice relating to development control and environmental impact assessment; selected planning techniques, strategies and principles; and the evaluation of planning proposals, reports and practices.

27628

Law for Leisure, Sport and Tourism

6cp; prerequisite(s): 27126 Leisure in Australia; 27648 The Tourism Industry
Undergraduate

This subject introduces students to legal principles and laws as they relate to leisure, sport and tourism activity and its management. It covers law as it affects the leisure participant, the tourist and the sportsperson, the leisure professional, the tourism manager and the sports administrator.

27642

Tourism Marketing

6cp; prerequisite(s): 24108 Marketing Foundations; 27648 The Tourism Industry
Undergraduate

This subject identifies and describes those characteristics of personal services that impact upon the formulation of marketing strategies and tactics. It examines approaches to the design, development and delivery of tourism services; describes and discusses pricing, communication, and distribution strategy options available to tourism services marketers; identifies factors impacting upon market selection, positioning, and demand management within tourism firms; and discusses approaches to organisational design consistent with the achievement of a marketing orientation within tourism firms. The analysis of case-specific data relating to tourism industry marketing practices is a central aspect of this subject.

27648

The Tourism Industry

6cp
Undergraduate

This subject introduces students to the study of the tourism industry. It identifies and systematically analyses the various sectors of the industry in terms of their functional, structural, operational and interrelational attributes and examines the nature of the interrelationships between the tourism industry and the significant environments with which it interacts. It provides students with an understanding of the specific context within which intra-industry management, and public sector policy aimed at the overall management of tourism, are practised.

27706

Tourism Strategy and Operations

6cp
Postgraduate

This subject provides students with knowledge and understanding of management as a social process; the ability to analyse management theories and empirical studies and assess their applicability to various tourism industry settings and management structures; knowledge of the functions and levels of management in tourism industry organisations; the ability to formulate management strategies and perform management functions appropriate to sectors of the travel and tourism industry; and knowledge and understanding of the necessary ethics and responsibilities of tourism managers in relation to external environments and publics.

31060

Information Systems Principles

6cp

This subject introduces the concepts of information and information systems and introduces information retrieval systems which deal with classification and search techniques and the evaluation of web-based information resources. Students also learn key human aspects of IS development – stakeholder consideration, teamwork and usability. Students use collaborative software tools to produce a group report and reflect on this activity as a design process.

31136

Preparation and Review of IT Experience

6cp; prerequisite(s): refer to the handbook entry for the DipITProfPrac

This subject involves formal planning of and regular reporting on work experience undertaken in 31137 IT Experience 1. There is particular emphasis on the skills students hope to gain, both technical and social.

31137

IT Experience 1

0cp; prerequisite(s): refer to the handbook entry for the DipITProfPrac; corequisite(s): 31136 Preparation and Review of IT Experience

To pass this subject and 31139 Industrial Experience 2 students must complete a total of nine months' full-time employment in suitable IT-related work.

31138

Review of IT Experience

6cp; prerequisite(s): refer to the handbook entry for the DipITProfPrac; corequisite(s): 31139 IT Experience 2

This subject involves continued regular reporting and includes structured reflection on your work experience undertaken for 31139 IT Experience 1. Assessment also includes a report and an oral presentation given to fellow students on completion of your work experience.

31139

IT Experience 2

0cp; prerequisite(s): refer to the handbook entry for the DipITProfPrac; corequisite(s): 31138 Review of IT Experience

This subject is a continuation of 31137 IT Experience 1.

31415

Principles of Software Development A

6cp; corequisite(s): 31417 Computing Practice

The principles and practice of object-oriented software construction are introduced using the programming language Eiffel. Topics include the object-oriented concepts of classes, objects, clients and suppliers, inheritance, genericity, dynamic binding and polymorphism.

31425

Principles of Software Development B

6cp; prerequisite(s): 31415 Principles of Software Development A or another programming subject

The specification and implementation of stacks, queues, lists and trees are discussed as abstract data types. Formal mathematical specification of software and program correctness are discussed. Program testing methods are emphasised throughout the subject, as are aspects of software quality such as usability.

31428

Quantitative Modelling

6cp

This subjects covers reasoning with data, descriptive statistics, probability theory, distributions, estimation, hypothesis testing, spreadsheet exercises, report writing, principles of modelling, queuing models, utility models, adaptive methods, and case studies of some basic models.

31429

Procedural Programming

6cp; prerequisite(s): 31415 Principles of Software Development A

This subject deals with top-down structured program design techniques and their application to the development of commercial programming applications. Emphasis is on the quality and usability of the resultant systems. Debugging and testing skills are developed. The language used is C.

31436

Systems Software and Networks

8cp; prerequisite(s): 31429 Procedural Programming; 31416 Computer Systems Architecture

This subject builds on 31416 Computer Systems Architecture to provide an understanding of the operating system, and communications hardware and software that provide support for user applications. Particular attention is paid to the role of systems software in distributed systems.

31465

Object-oriented Programming

6cp

This subject introduces object-oriented (OO) programming in Java. It covers the topics of data flow, procedures, classes, and data structures. It also shows how to build a graphical user interface (GUI) to a Java system.

31466

Principles of Distributed Computing

6cp

This subject introduces distributed applications as one of the foundations of a modern computing environment. It focuses on the principles surrounding the use and development of applications in a networked environment and introduces some of the basic hardware components of networked computing devices. Students have the opportunity to develop skills in using distributed applications and developing simple websites.

31468

Information, Classification and Control

6cp

This subject introduces the concepts of information and information systems and introduces two major types. For information retrieval systems, the subject deals with classification and search techniques and the evaluation of web based information resources. For accounting information systems, the subject covers basic accounting principles, classification of accounts, accounting with spreadsheet packages and budgeting and control.

31469

Object-oriented Design

6cp; prerequisite(s): 31465 Object-oriented Programming

This subject shows how to design, build, test, document, and maintain large or complex object-oriented (OO) systems. It presents a set of design frameworks, patterns, and rules, along with a set of explicit evaluation criteria that can be used to judge the quality of a reusable OO system. It also presents the problems that arise in large system development, and discusses technical tools to solve these problems.

31470

Distributed Computing Architecture

6cp; prerequisite(s): 31466 Principles of Distributed Computing; 31465 Object-oriented Programming

This subject focuses on the design and development of distributed applications that exchange information. It looks at information architectures for distributed applications, and typical application requirements for information exchange. It examines the Extensible Mark-up Language, XML, and related standards as a language for information exchange and provides the opportunity for students to develop Java applications that parse and exchange information. Finally it offers more distributed system theory, including coverage of operating systems and software for distributed systems.

31471

Networking 2

6cp; prerequisite(s): 31467 Networking 1

This subject extends the work done in 31467 Networking 1. Students learn to apply the concepts and develop higher level skills in the design and operation of larger scale networks using higher level networking devices. Students will be well placed to pursue a specialisation in network design and management if they so choose. The subject also develops skills necessary for information technology planning and design of systems that are network focused. The emphasis in this subject is intranets that use routers. The role and operation of routers in a range of computer networks are examined in detail. Router-based networks are designed and routers configured. Deeper treatment of IP addressing and routing protocols is undertaken. The impact of routing protocol choices on network behaviour is emphasised. Skills in network design, router configuration and network troubleshooting are further developed.

31472

Introduction to Collaborative Systems

6cp

This subject introduces students to key human aspects of IS development: stakeholder consideration, team work and usability. Students use collaborative software tools to produce a group report and reflect on this activity as a design process.

31473

Data Structures and Procedural Programming

6cp; prerequisite(s): 31469 Object-oriented Design

In first year, students learned more abstract aspects of programming. This subject takes a more machine-oriented viewpoint: it discusses the implementation and design of data structures, the efficiency of data structures, the design and implementation of algorithms and the complexity of algorithms. Students learn to program in C, gain an understanding of aspects involved in the execution of programs in various languages (such as memory management and garbage collection) and develop skills in using tools for program development (such as source level debuggers, version control tools and make files/project files).

31474

Database Fundamentals

6cp

This subject introduces students to basic database modelling, design, and implementation concepts and techniques. Entity-Relationship (E-R) modelling methodology is described in detail and the students learn how to model information requirements and develop conceptual models from user specifications. Relational database theory is presented including the description of the relational model and theory of Normal Forms. Transformations techniques between the E-R and relational models are described. Database programming using SQL is introduced in lectures and supported by practical exercises using a relational DBMS. Advanced database topics including database APIs, triggers, and stored procedures are briefly introduced.

31475

Requirements Engineering

6cp; prerequisite(s): 31472 Introduction to Collaborative Systems

This subject introduces students to the foundations of Requirements Engineering which is among the most important contributors for developing good quality software that meets the real needs of users. Students become familiar with the front-end activities of software development and learn about methods, techniques and tools that assist in the important collection of activities that makes up the requirements engineering process.

31476

Systems Development Project

12cp; prerequisite(s): 31474 Database Fundamentals; 31475 Requirements Engineering

This subject involves using a case study approach to explore the design and development of a complex set of information systems services. The application domain is a commercial setting, with a special focus on integration of new and legacy systems. In addition, transaction processing and distribution issues are addressed.

31479

Information Technology Professional and Society

6cp; prerequisite(s): 31476 Systems Development Project

This subject covers the body of ideas and commonly held principles that apply to professional standards and ethical behaviour in the information technology industry. The intent is to expose students to standards of professional behaviour and legal responsibility through case studies and current media-related articles featuring potential ethical and/or legal situations/dilemmas. It considers the history of information technology, the impact of information technology on society, the IT profession's Codes of Ethics and Codes of Conduct and the legal requirements pertaining to the information technology industry.

31748

Programming on the Internet

6cp; prerequisite(s): 31436 Systems Software and Networks and an OO Programming language

This subject introduces students to the specifics of the World Wide Web and Internet based programming. The evolution of the Internet and its technical foundation will be studied as well as basic techniques for presenting data, text and pictures on the World Wide Web. The client/server paradigm will be explored in detail featuring website design and construction using HTML (Hyper Text Markup Language), CSS (Cascading Style Sheets), PHP (Hypertext Preprocessor), MySQL (Backend database), JavaScript and Java Applets.

The subject introduces the concept of concurrent programming. In the course, students learn how to use threading in Java to design advanced Graphical User Interfaces. This subject also introduces some existing tools that can be used for website design and administration. This subject provides a sound basis for understanding how the WWW functions, how to construct web pages and how to write software for the WWW using scripting techniques and the Java programming language.

31904

Systems Programming

6cp; prerequisite(s): 31429 Procedural Programming

This subject allows students to develop their Perl and UNIX knowledge and skills appropriate for professional practice in a UNIX environment. The subject also exposes students to other high level 'scripting' utilities. This is of general benefit and is not covered elsewhere in the course.

33490

Computational Mathematics and Physics

6cp

5hpw; prerequisite(s): 68201 Physics in Action (Physics 2); 33390 Mathematics and Scientific Software

The subject is an introduction to the study of complex physical systems by computer and an introduction to computational tools used in areas such as molecular spectroscopy, fluid flows, diffusion of pollutants, scanning tunnelling microscopy, wave propagation along optic fibres.

Topics covered include: one dimensional heat and wave equations; solution by separation of variables; Fourier sine and cosine series; line and surface integrals divergence and curl; theorems of Gauss and Stokes; functions of a complex variable; Cauchy-Riemann equations; complex integration; Cauchy's integral theorem and integral formula; Taylor and Laurent series; and singular points and their use in contour integration.

48210

Engineering for Sustainability

6cp

Undergraduate

Upon completion of this subject, students should be able to demonstrate development in the following areas:

- orientation to university study
- ability to read critically and write appropriately in a variety of academic contexts
- appreciation of the social and historical contexts of engineering
- awareness of different definitions of 'progress'
- awareness of what is 'professionalism'
- appreciation of the role of codes of ethics, and
- appreciation of the principles of sustainability.

This subject takes students on a journey into the past, present and future of engineering and its relationship to society and the environment. They choose one of several module groups based around broad engineering-related themes.

Within these modules, students examine the contributions made by engineers in their respective areas, how they were received by and benefited different groups in society, and what impact they had on the environment. Current and historical case studies from our local communities as well as from other parts of the world are used to illustrate the different ways in which technologies have evolved and have been valued.

The subject is taught by an interdisciplinary team who will present lectures, and facilitate interactive workshops.

48221

Informatics VB

6cp

Undergraduate

This subject has the same objectives as 48023 Object-oriented Programming but uses the language Visual Basic as the vehicle for developing student knowledge and understanding.

48230

Engineering Communication

6cp; prerequisite(s): 48210 Engineering for Sustainability

Undergraduate

On completion of this subject students should be able to: understand basic principles and theories of human communication; research within the various discipline areas that inform the study of communication; write competently in a number of different genres; perform competently in a variety of oral communication situations; understand basic principles and practices of graphic communication; demonstrate their ability to express engineering concepts through graphical communication;

demonstrate their ability to 'converse' mathematically; lead and participate in group processes; appreciate the central role of communication in engineering practice.

Topics include: principles and theories of communication; communication in practice; the processes of communication; and communication technology.

48240

Uncertainties and Risks in Engineering

6cp; prerequisite(s): 48210 Engineering for Sustainability; 48221 Informatics VB; 33230 Mathematical Modelling 2
Undergraduate

In this subject, students engage in ideas of how, as engineers, they have a responsibility to make appropriate analysis of different types of risk scenarios, how risk is perceived and assessed by different groups of people, and what constitutes 'management' of risks. In order to engage in these ideas, students need and learn various theories, techniques, and experiences as they progress through the subject.

Upon conclusion of this subject, students are expected to demonstrate:

- a critical appreciation of ideas concerning decision making under risk, uncertainty, ignorance and indeterminacy, and an appreciation that each person and group has knowledge, attitudes and beliefs about risk and uncertainty which, to the individual or group, are 'rational'
- awareness of contexts in which experts, including professional engineers, manipulate problems involving risk and uncertainty
- experience in formulating and undertaking a modelling exercise, and a critical appreciation of the uncertainties and subjectivities inherent in modelling, and
- the ability to select and apply appropriate statistical tools, to acquire additional statistical competencies, and to evaluate their strengths and limitations.

48250

Engineering Economics and Finance

6cp; prerequisite(s): 48110 Engineering Experience 1; 48240 Uncertainties and Risks in Engineering
Undergraduate

The objectives of this subject are for students to be able to use their knowledge of engineering culture to develop an understanding of the relationship between economics and finance and engineering; to gain a working knowledge of macro and microeconomic theories in the context of engineering practice, ethics and sustainability; to acquire skills in determining the appropriate use and limitations of various economic and financial models and techniques used to define/manage/analyse engineering activities; to develop competence in identifying and working through the economic and financial aspects of an engineering project/case study; to become aware of the impact of various economic and financial models and techniques on the social and technical dimensions of engineering activity; to integrate economic and financial understanding and fields of practice specialist knowledge in project-based/case study work.

Topics include: a basic understanding of the place engineers occupy in the economic environment; the terms, philosophies and mechanics of economic documentation as they may be seen by engineers in their professional context; and the financial, economic, environmental and social issues confronting engineers in technological project management and costing.

48260

Engineering Management

6cp; prerequisite(s): 48122 Engineering Practice Review 1 or 48120 Review of Engineering Practice 1; 48240 Uncertainties and Risks in Engineering
Undergraduate

This subject enables students to develop the following: an appreciation that management is integral to engineering in aspects ranging from the personal to the organisational; an awareness of the roles and functions of management – general, engineering and project management; and an understanding of the rationale underpinning various engineering and project management models and tools and the interaction with engineering practice. It introduces and analyses a range of engineering and project management tools, developing an appreciation of their appropriate uses, strengths and weaknesses. Building on awareness developed in earlier subjects, and through work place experiences, it introduces students to the potential impacts of engineers' decisions and management on the community and the client. Students will acquire skills in choosing and using the most appropriate engineering and project management tools for identifiable engineering activities.

Topics include: concepts of general management and engineering and project management and their relationships; systems/product life cycle model and the various contributions which engineers make, or can make, during this cycle; and the contributions of other occupations; models used to visualise the processes occurring during the cycle, and for envisaging management and decision making; the range of tools which can be applied for various purposes during the cycle, e.g. to make decisions, manage people, manage resources, audit and account for management of resources, etc.; historical development of this range of management, theories, tools, and models, and the arguments for and against them; engineering and project management; and the capabilities required of engineering managers.

48270

Technology Assessment

6cp; prerequisite(s): 48240 Uncertainties and Risks in Engineering
Undergraduate

The objective of this subject is to provide students with an understanding of technology as a context-based process, and to gain an appreciation of how it has been specifically constructed within the engineering culture.

Students develop an appreciation of the two-way influences between technology and society. This allows students to review and critique paradigms and tools for assessing technology; compare and critique methodologies and strategies for dealing with the impacts of engineering activity; develop skills in determining the appropriate use of various techniques used by decision makers to manage/determine the impact of engineering activity; develop skills in involving community in decision making regarding the impact of engineering activity; gain an appreciation of the diversity of engineering practice and its interdependence with other professions; experience and reflect on the interdisciplinary nature of engineering activity.

The subject provides case studies for student exercises in assessment in, for example, forecasting, policy, assessment, venture capital or innovation assessment, or consultancy advice to researchers, government or corporate managers.

48310

Introduction to Civil Engineering

6cp
Undergraduate

The objectives of this subject are: to ensure a general understanding of the role of the civil engineer in the provision of basic infrastructure necessary to support the development and maintenance of urban and rural settlement; to provide a sound foundation for further education in the processes of design, construction, operation and maintenance of community infrastructure; to provide an understanding of the need to consider the demands and expectations of the community, while having due regard for both the developed and fragile natural environment; to ensure an understanding of the need to develop the necessary individual, and multidisciplinary skills in civil engineering project analysis and development; and to develop effective verbal and written communication skills.

Lecture content includes: civil engineering and the environment, phases of civil engineering work, drawings and specifications, loads and deflection, uses and behaviour of construction material (concrete and steel), building dynamics, soils and civil engineering, soil retention structures, roads and traffic engineering, water engineering.

Field work and associated design exercise: two sessions (3 hours' duration each) of basic surveying and levelling in the field, followed by one three-hour session of design work involving catchment area calculation, stormwater run-off estimation, longitudinal section plotting, and pipe gradient design using basic formulae. This segment serves as an introduction to surveying, hydrology and urban stormwater management subjects.

Seminar presentation: two sessions of two hours' duration each for presentation of a short discussion paper on a civil engineering topic of individual choice. Use of audiovisual aids is encouraged.

Laboratory sessions: two sessions of 1.5 hours' duration involving demonstration of water engineering and building dynamics.

Projects – Discovery: two formal sessions of three hours' duration and supplementary work in group format to develop experimentation and understanding of the engineering process.

Site visit: all students must attend an all-day site visit of a civil engineering project or operational facility, to gain an appreciation of the workplace. Practising civil engineers and other professionals accompany the students in outlining the necessary skills required to design and construct an engineering project or operational facility. Site visits may include inspection of the following facilities after construction: water treatment plant, wastewater treatment plant, water storage dam and associated power station. Site visits may also include the following during construction: arterial road (freeway/motorway), road bridge, transportation facility (light rail), commercial or industrial building, coastal engineering structure (coal loader or harbour structure).

48440

Software Engineering

6cp
Undergraduate

The objectives of this subject are to: develop in students a critical understanding of issues related to the engineering of large complex software systems; to bring students to the point where they are fluent in the objectives of software engineering; and to ensure that they are competent in techniques to realise software systems utilising appropriate software engineering approaches, tools, and techniques. Students learn how to develop a set of requirements, apply rigorous software analysis, and to design, code and test their work. On completion of the subject students are competent to engineer moderately complex software systems, as members of a software development team.

Topics include: software engineering concepts, including software projects, planning, management, processes, methodologies, etc.; software requirements engineering; formal methods for software engineering; adaptation of software development methodologies to suit specific projects; validation and verification; software estimation and costing; configuration management; software project planning, budgeting, quality assurance (including walkthroughs and reviews, etc.); and software development CASE tools. The subject uses a problem-based learning approach with students working in small teams. A set of lectures is combined with workshops where students apply the techniques introduced.

48450

Real Time Operating Systems

6cp; prerequisite(s): 48440 Software Engineering; 48441 Introductory Digital Systems
Undergraduate

In this subject students learn to: be familiar with the Unix operating system at the POSIX definition level; develop C applications to run on a POSIX standard operating system; know the basic principles of the design and implementation of a centralised POSIX defined operating system; know how the centralised operating system functionality can be expanded into a distributed operating system; know the basic principles of hard real-time application programming (rate monotonic and deadline monotonic to be examined in depth); and know how to apply the hard real-time principles to existing hard real-time operating systems employing the POSIX standard (as a minimum).

Topics include: the use of the Unix operating system and other POSIX defined operating systems as tools for developing real-time control applications; advanced control application-based C programming; real-time principles and concurrent programming techniques; distributed operating systems employing distributed memory management, process management, file systems, and I/O; and client/server programming, typically using Windows NT. Rate monotonic and deadline monotonic analysis will be examined as a method of providing hard real-time application verification.

48451

Advanced Digital Systems

6cp; prerequisite(s): 48441 Introductory Digital Systems
Undergraduate

The objectives of this subject are that students learn to: analyse, design and implement a programmable digital system based on a user requirement specification, and investigate advanced computing architectures. The subject has two major components: (i) analysis/design, and (ii) implementation, of an advanced computing node. The components are integrated and are each worth 50 per cent of the course mark.

The subject provides an in-depth understanding of the analysis/design and implementation of advanced digital hardware at medium scale computer system building block level. It builds on the basics of 48441 Introductory Digital Systems introduced in the earlier fields of practice subject.

Topics include: digital design process, functional design, implementation technologies, advanced computer architectures, and memory and I/O systems. It emphasises computer-aided design, including the use of VHDL specification, simulation and programmable VLSI implementation technologies.

48510

Introduction to Electrical Engineering

6cp
Undergraduate

The major objective of this subject is to give early stage students some understanding of the scope and methods of electrical engineering. This includes the engineering process, the technologies involved, the approach to problem solving, and the skills and tools used.

The subject material is organised around two modules. In Module 1, The Basics, basic electrical concepts such as voltage, current, resistance, power, DC and AC are introduced; supply and utilisation of domestic electricity is explored; and the functions of components commonly found in a linear DC power supply are covered. The practical aspects of this module include learning how to use basic equipment such as a multimeter and CRO, learning some simple 'tinkering' skills, and building and testing a DC power supply.

In Module 2, 'Applications in Electrical Engineering', the focus is on a typical application, a PC-based data acquisition system. The functions of the basic components of this system are presented, as well as the assembly and testing of a PC data acquisition kit. Fundamentals of digital electronics are also presented in this module. Finally, students are engaged in a design process where they combine a number of key theoretical concepts and practical skills to complete a project.

48570

Data Acquisition and Distribution

6cp; prerequisite(s): 48540 Signals and Systems; 48441 Introductory Digital Systems
Undergraduate

By the end of this subject students should be able to: analyse, design, build and test: data acquisition and distribution systems (DADS), measurement systems, and intelligent instrumentation systems; characterise, specify and select to satisfy the requirements of DADS: sensors/transducers and associated circuits, transducer analog interfacing and signal conditioning circuits, and data conversion devices and systems; interface DADS to computers, plant and installations; and write, test and embed control and programming software for DADS interfacing.

Material to be taught and learnt includes: applications, requirement specifications and typical architectures of DADS; general performance characteristics of DADS components and subsystems; physical principles and design fundamentals of sensors and transducers; mechanical, temperature, pressure, flow-rate, level transducers and applications; optoelectronic transducers and applications; transducer analogue interfacing; precision amplifiers and low-level signal conditioning; noise, guarding and shielding in instrumentation systems; data conversion devices and systems; DADS design; time and error budget of DADS; computer structures for DADS; DADS interfacing to computers and control software; intelligent instrumentation systems; and data integrity.

48610

Introduction to Mechanical and Mechatronic Engineering

6cp
Undergraduate

The objectives of this subject are to give students a clear idea of where mechanical engineering fits in the profession and in society; and of the career options open to mechanical engineers and the sorts of problems that mechanical engineering addresses. Students learn how mechanical engineering is conducted in the 'real world'; become aware of the engineering method and systematic approaches to the design process; learn to perform and explain simple mechanics problems and to perform the required calculations. They also learn to: graphically represent objects by sketching, using drawing instruments and/or computer methods using standard representation techniques such as orthographic projection; gain an understanding of different materials, making selections based on fundamental material properties and required uses; and become aware of issues associated with moving and rotation machinery – such as lubrication/vibration/noise.

Topics include: introduction to the mechanical engineering profession; design and the engineering method; system-oriented approaches to design and problem solving; introductory mechanics; sketching, drawing, and representation techniques; introduction to and awareness of various aspects of mechanical engineering, e.g. materials; manufacturing; thermodynamics and heat transfer; electromechanical devices; rotating machinery; and lubrication and wear.

48720

Introduction to Telecommunications Engineering

6cp
Undergraduate

The objectives of this subject are: to introduce students to the basic concepts and terminology used in telecommunications engineering; to give them basic, up-to-date, 'hands-on', technical skills to assist in finding employment in the field as part of the degree program; to familiarise them with the telecommunications degree program and the rationale behind its structure; and to introduce them to staff involved in telecommunications engineering so that they are aware of current research activities in the field.

Topics include the following: telephony – the public switched telephone network, mobile telephone networks; computer communications – modems, host computers[1] (PCs, and workstations), networks[1], the Internet[1], mobile communications; broadcast systems – radio and television, satellite and cable TV; integrated networks – ISDN and ATM.

[1] These topics are covered in more depth.

48820

Introduction to Environmental Engineering

6cp
Undergraduate

The objectives of this subject are: to introduce students to key concepts of environmental science and engineering, and to the social, legislative and political context of the work of environmental engineers; to develop their understanding of the consequences of humans interacting with their environment; to enable them to answer questions such as: What is pollution? and What skills are needed for the responsible practice of environmental engineering?

The following material is examined and integrated:

- the work of environmental engineers – local and global environmental problems and their implications for engineers; the emergence of environmental engineering as a separate discipline; issues addressed by engineers who regard themselves as environmental engineers in Australia; career paths; interactions between environmental engineers and other professions, occupations and groups; community attitudes towards engineers and the social and professional implications of these attitudes for their work; the IEAust Code of Ethics and policies on the environment, heritage and sustainability; journals and other sources of information on environmental engineering; and an introduction to environmental management systems and auditing
- the social environment – the social construction of 'environment'; environmental ethics; an introduction to environmentalism, especially in Australia; and aims and strategies of Australian non-governmental environmental organisations and community action groups
- the political and legislative environment – how environmental policy and decisions are made; the nature of environmental disputes, and their resolution; and environmental legislation and environmental planning
- the natural environment – the atmosphere, hydrosphere and geosphere; the science of the atmosphere and hydrosphere; the concept of biogeochemical cycles in the context of environmental engineering; an introduction to climate, geomorphology, and soil and vegetation associations; and methods used to monitor the environment, and geographical information systems
- consequences of humans interacting with their environment – the environmental impacts of poorly planned urbanisation, industrialisation, and other forms of development; the sources, causes, and

effects of air, noise, water and soil pollution; and an introduction to the mitigation and abatement of these impacts.

49550

Computing for Groundwater Specialists

0cp; block attendance totalling 24 hours or distance mode
Postgraduate

This subject provides the computing background needed for students with varying degrees of computer literacy. Topics covered include DOS and Windows operating systems, databases, spreadsheets, word processing, statistical and graphical packages with applications relating to groundwater processes. The subject is conducted through three intensive computer lab sessions.

49551

Surface Hydrology and Groundwater

6cp; block attendance totalling 36 hours or distance mode
Postgraduate

This subject, conducted through a combination of classroom and lab sessions, provides the interface process link between surface hydrology and groundwater. Topics include hydrological cycle, water and energy balances and circulation, precipitation, interception, infiltration, storm run-off, hydrograph analysis, evaporation and transpiration, surface and groundwater interactions, land-use effects, and artificial recharge.

49554

Groundwater Computing

6cp; block attendance or distance mode
Postgraduate

This subject, conducted through a combination of classroom and lab sessions, provides a strong computing basis for groundwater management especially in the area of statistics and graphics as applied to groundwater problems involving computing. It provides an introduction to DOS and Windows operating systems, databases, spreadsheets, word processing, elements of geostatistics and graphical packages with applications related to groundwater processes, and groundwater computing project.

49555

Groundwater Modelling

6cp; block attendance totalling 36 hours or distance mode; corequisite(s): 49550 Computing for Groundwater Specialists
Postgraduate

The subject, conducted through a combination of classroom and lab sessions, provides the computer modelling tools required for particular groundwater resource management underpinned by an adequate appreciation of the underlying theory and computer algorithms. Topics include conceptual modelling, analytical modelling, numerical modelling and solution algorithms applied to the governing differential equations. Emphasis is placed on finite difference and finite element methods with applications to groundwater resource studies, borefield management, optimisation problems.

50125

Communication and Audience

8cp

In this subject students analyse different approaches to concepts of the audience from a communication perspective. They critically evaluate the media-influence process and use case studies for a comprehensive and critical assessment of theoretical approaches. Students review and apply semiotics as an approach to understanding the many influences on individual interpretation of visual, auditory and verbal signs. They assess methods to measure audience and to understand audience reception. This subject also explores issues and trends in communication and the implications of the increase in opportunities for interaction on concepts of the audience.

50127

International Communication

8cp; prerequisite(s): 50106 Media, Information and Society or 50227 Media, Information and Society 50106 Media, Information and Society or 50227 Media, Information and Society

This subject examines the increasing internationalisation of communication and cultural networks, with particular reference to national and (sub)cultural identities and media/communication industries. It explores the historical development of debates about social development, cultural imperialism and globalisation, and using case studies from Australia and elsewhere, examines contemporary debates about the impact of electronic media on popular culture and heritage in constructing 'mainstream' and 'minority' identities.

50128

Media, Information and the Law

8cp; prerequisite(s): 50106 Media, Information and Society or 50227 Media, Information and Society

This subject examines the ways in which the media and information are regulated. Rather than examining the law in isolation, the subject looks at law making and practice in the context of broader economic, political, historical and social processes. The subject begins with a comparative critique of notions of free speech and expression in different national and international contexts. While existing law in key areas (e.g. defamation, censorship, freedom of information, copyright) is outlined, there is a strong emphasis on developing a critical and comparative understanding of legal processes, the ways in which the law works in practice and the policy issues which arise. There is an opportunity for students to select major individual or group projects in areas of professional and intellectual interest.

50129

News and Current Affairs

8cp; prerequisite(s): 50106 Media, Information and Society or 50227 Media, Information and Society

This subject takes a comparative theoretical approach to studying the exercise of power in the production of news and information programs in the media. It deals with the economic and institutional contexts, debates about the role of the press in democratic political processes, relations between journalists, their sources and public relations professionals, the impact of new media technologies and relations with audiences. Students are expected to develop research skills in this area, including a capacity to analyse their own media production work in the context of current scholarship in the field.

50140

Comparative Social Change

8cp

The aim of this subject is to provide students with an understanding of the processes of modernisation and social change in a comparative context using case studies in countries of Western Europe, Latin America, East and South-East Asia. The lectures highlight a number of key issues, e.g. whether the processes of social change are universal or specific; the consequences of modernisation in and for the economy, politics, society, culture and ideology of non-Western societies and whether the established Eurocentric analytical models are still useful in understanding the modern world. Students gain an understanding of differing interpretations of modernisation flowing from various relations of power and the multiplicity of views regarding the meaning and significance of modernisation.

50159

Public Relations Principles

8cp

This subject introduces students to the principles of public relations by examining the concepts, theories and contexts of professional practice. The subject traces the historical development of public relations from technical orientations to strategic management roles and functions. Students critique current practices and issues with reference to contemporary case studies and professional industry representatives. They develop their understanding of socially responsible, ethical public relations practice through a critique of contemporary public relations models. They continue to enhance their research skills and ability to write across a wider range of appropriate media.

50160

Public Relations Strategies

8cp; prerequisite(s): 50159 Public Relations Principles

This subject is the second in the sequence of public relations subjects and further positions public reactions within the context of broader strategic management. It develops an understanding an appreciation of strategy through issues identification, stakeholder analysis, and strategy writing. Students apply the concepts and practices of professional public relations to develop, design and produce innovative resources to address client problems or opportunities. They build on expertise in translating complex public relations campaign strategy to communication products within the constraints of planning, budgetary and evaluative processes.

50179

Virtual Communities

8cp; prerequisite(s): 50106 Media, Information and Society or 50227 Media, Information and Society

This subject takes a historical approach to the analysis of changing social relations brought about by the development of new communication technologies. It situates current debates about globalisation and the Internet in the context of discussion around the introduction of the telegraph, radio, television and globalising industries such as print and popular music. It explores historiographical issues including the utopian/dystopian dipole in perspectives, the nature of 'community' in indigenous, commercial and sociopolitical contexts, the scale and pace of historical change over time and space, and changing perceptions about Australia's internal and external relations.

50226

Communication and Information Environments

8cp; elective

The subject aims to familiarise students with the major issues in the communication and information environments in which we live, and to introduce different ways of approaching and analysing those issues. It asks questions like: what is communication?; how do societies and individuals create meanings?; and how do communication technologies in their social and industrial settings structure such meanings? The subject also explores the nature of information for daily life, social interaction, change and development.

Some of the current major issues in the communications and information sphere are explored, e.g. 'convergence', the nature of the 'Information Society', globalisation, questions of ownership of and access to the channels of communication and information, the division between 'public' and 'private' and the role of the state, and the development of new media and information forms.

The subject also begins to examine the various theoretical paradigms and frameworks for analysing these issues, in preparation for the second subject in the Disciplinary Strand.

50227

Media, Information and Society

8cp

This subject introduces current theoretical approaches to the study of the fields of communication and information, and compares and contrasts some of the major paradigms in use in the analysis of the issues in the communication and information environments in which we live. The subject helps students understand the range of social science and social and cultural theoretical approaches relevant to the field, including liberal pluralism, Marxist and post-Marxist approaches, post-modernist and post-structuralist approaches, as well as those helpful in taking a user-oriented approach to communication and information, such as cognitive science and interpretive-constructivist traditions.

In order to anchor these theoretical approaches, the subject concentrates on one or two of the major issues introduced in the subject Communication and Information Environments, e.g. questions of globalisation and national identity in relation to communication and information, questions of power and access, especially in relation to cultural diversity, and freedom of information and censorship. The theoretical paradigms are compared and contrasted in terms of their historical origins, their epistemological soundness and their effectiveness as methodologies for investigating problems and issues in the field.

50238

Public Communication Processes

8cp

Key areas are studied to ensure that students are able to practice as professional communicators who can advise others about communication and implement creative campaigns. Students need to develop a high level of communication expertise in their written, oral and audiovisual presentations and be skilled in argument and in analytical and creative approaches to problems. Issues covered include the research and shaping of audience opinions, attitudes and behaviour. Students develop audiovisual literacy, knowledge of design principles and an advanced understanding of how personal, social and cultural constructs and images are formed. Students gain skills in working with texts, images and sound through practical workshops and are introduced to the basics of using computers for such purposes.

50293

Community Research Elective (UG)

6cp

This subject provides single or multidisciplinary-based learning options for students in all courses in a flexible learning environment. The subject is carried out with a community partner, organised and administered through UTS Shopfront and supervised by relevant academics. The subject aims to give students the opportunity to develop their intellectual and professional skills to a high degree of excellence in a real-life environment. Through this elective students are able to put their research skills to the test, establishing the relevance of academic frameworks and research methodologies. While having access to an academic supervisor and to advice from UTS Shopfront staff, students are required to be substantially self-motivating. They must be capable of bridging the divide between university and community, bringing to bear theoretical or policy debates in what are often very specific social settings. The elective offers a challenging but highly rewarding experience, and has been used as a way of opening up options for more in-depth social research, e.g. through the Social Inquiry Honours program.

50294

Community Research Elective (UG)

8cp

This subject provides single or multidisciplinary-based learning options for students in all courses in a flexible learning environment. The subject is carried out with a community partner, organised and administered through UTS Shopfront and supervised by relevant academics. The subject aims to give students the opportunity to develop their intellectual and professional skills to a high degree of excellence in a real-life environment. Through this elective students are able to put their research skills to the test, establishing the relevance of academic frameworks and research methodologies. While having access to an academic supervisor and to advice from UTS Shopfront staff, students are required to be substantially self-motivating. They must be capable of bridging the divide between university and community, bringing to bear theoretical or policy debates in what are often very specific social settings. The elective offers a challenging but highly rewarding experience, and has been used as a way of opening up options for more in-depth social research, e.g. through the Social Inquiry Honours program.

50295

Community Research Elective (PG)

6cp

This subject provides single or multidisciplinary-based learning options for students in all courses in a flexible learning environment. The subject is carried out with a community partner, organised and administered through UTS Shopfront and supervised by relevant academics. The subject aims to give students the opportunity to develop their intellectual and professional skills to a high degree of excellence in a real-life environment. Through this elective students are able to put their research skills to the test, establishing the relevance of academic frameworks and research methodologies. While having access to an academic supervisor and to advice from UTS Shopfront staff, students are required to be substantially self-motivating. They must be capable of bridging the divide between university and community, bringing to bear theoretical or policy debates in what are often very specific social settings. The elective offers a challenging but highly rewarding experience, and has been used as a way of opening up options for more in-depth social research, e.g. through the Social Inquiry Honours program.

50296

Community Research Elective (PG)

8cp

This subject provides single or multidisciplinary-based learning options for students in all courses in a flexible learning environment. The subject is carried out with a community partner, organised and administered through UTS Shopfront and supervised by relevant academics. The subject aims to give students the opportunity to develop their intellectual and professional skills to a high degree of excellence in a real-life environment. Through this elective students are able to put their research skills to the test, establishing the relevance of academic frameworks and research methodologies. While having access to an academic supervisor and to advice from UTS Shopfront staff, students are required to be substantially self-motivating. They must be capable of bridging the divide between university and community, bringing to bear theoretical or policy debates in what are often very specific social settings. The elective offers a challenging but highly rewarding experience, and has been used as a way of opening up options for more in-depth social research, e.g. through the Social Inquiry Honours program.

50483

Strategic Organisational Communication

8cp; prerequisite(s): 50106 Media, Information and Society or 50227 Media, Information and Society or 50480 Conceptual Frameworks for Public Communication

This subject builds on previous study of conceptual frameworks in public communication and introduces both historical and emerging theoretical constructs of organising. It presents a critical analysis of these constructs and their relationship with communication within organisations. Students examine the nature of strategic communication interventions in and around globalisation and technology within local, national, and transcultural organisational contexts. They evaluate notions of communicative relationships, and the concept of communication as a structuring principle. Students investigate organisational complexity, culture, climate, structures, and change management. Critical assessment of organisational practices are applied to issues around transformational leadership.

59304

English for Academic Purposes 1

8cp; prerequisite(s): IELTS score 5.0 (students with an IELTS of 6.0 and above are exempt from this subject)

This is the first of two subjects specifically for international students. The aim of these subjects is to ensure that students' language and study skills have developed sufficiently to enable them to successfully participate in classes alongside other UTS students.

The subjects focus on developing the language and learning skills required for tertiary study in Australia. They integrate the four macroskills – reading, writing, listening and speaking – into a thematic approach which looks at a variety of contemporary issues in Australian culture and society. These issues are linked to subjects which may be studied in subsequent years at UTS. Students take a critical/analytical approach to understanding and producing written and spoken texts appropriate for an Australian tertiary context.

59305

English for Academic Purposes 2

8cp; prerequisite(s): IELTS score 6.0 or 59304 English for Academic Purposes 1

This is the second of two subjects specifically for international students. The aim of these subjects is to ensure that students' language and study skills have developed sufficiently to enable them to successfully participate in classes alongside other UTS students.

The subjects focus on developing the language and learning skills required for tertiary study in Australia. They integrate the four macroskills – reading, writing, listening and speaking – into a thematic approach which looks at a variety of contemporary issues in Australian culture and society. These issues are linked to subjects which may be studied in subsequent years at UTS. Students take a critical/analytical approach to understanding and producing written and spoken texts appropriate for an Australian tertiary context.

59306

Researching Australia 1 – Ethnography

8cp; prerequisite(s): IELTS score 5.0

This is the first of two subjects specifically for international students in the Advanced Diploma in Australian Language and Culture. The aim of these subjects is to introduce students to a range of intercultural issues and to investigate the cultural norms of Australian society through the application of specific research methods. At this level, students use ethnographic techniques to investigate aspects of contemporary Australian experience.

59307

Researching Australia 2 – Researching for Study

8cp; prerequisite(s): IELTS score 6.0 or 59306 Researching Australia 1 – Ethnography

This is the second of two subjects specifically for international students in the Advanced Diploma in Australian Language and Culture. The aim of these subjects is to introduce students to a range of intercultural issues and to investigate the cultural norms of Australian society through the application of specific research methods. At this level, students use questionnaire and interview techniques to investigate aspects of contemporary student life and present their research both orally and in written report form.

59308

Australian Society and Culture 1

8cp; prerequisite(s): IELTS score 5.0

This is the first of two subjects specifically for international students in the Advanced Diploma in Australian Language and Culture. In these subjects students are introduced to several aspects of Australian society and culture: the indigenous experience; aspects of rural and urban Australia; the history of migration; and the development of multiculturalism. Students explore these aspects through film, documentaries, literature, music, art, sport events, etc. Visits to cultural institutions as well as presentations and guest lectures from experts are key features of these subjects.

59309

Australian Society and Culture 2

8cp; prerequisite(s): IELTS score 6.0 or 59308 Australian Society and Culture 1

This is the second of two subjects specifically for international students in the Advanced Diploma in Australian Language and Culture. In these subjects students are introduced to several aspects of Australian society and culture: the indigenous experience; aspects of rural and urban Australia; the history of migration; and the development of multiculturalism. Students explore these aspects through film, documentaries, literature, music, art, sport events, etc. Visits to cultural institutions as well as presentations and guest lectures from experts are key features of these subjects.

59310

Postgraduate Study in Australia

8cp; prerequisite(s): IELTS score 5.5 (minimum of 5.5 in writing); corequisite(s): enrolled in a postgraduate research degree at UTS

This is the first of three compulsory subjects in the Graduate Certificate in English for Academic Purposes (GCEAP) specifically for international students enrolled in a postgraduate research degree at UTS. The aim of this intensive subject is to provide students with a foundation in academic literacy and oracy skills required to start postgraduate studies at UTS.

This subject focuses on developing the language and learning skills required for tertiary study in an Australian university. It integrates the four macro-skills – reading, writing, listening and speaking – into a thematic approach which looks at a variety of contemporary issues in Australian culture and society. The subject also provides students with an understanding of studying at an Australian university and living in Australia.

59311

Academic English for Postgraduate Study

8cp; prerequisite(s): 59310 Postgraduate Study in Australia or equivalent; corequisite(s): enrolled in a postgraduate research degree at UTS

This is the second of three compulsory subjects in the Graduate Certificate in English for Academic Purposes (GCEAP) specifically for international students enrolled in a postgraduate research degree at UTS. The aim of this intensive subject is to provide students with academic literacy and oracy skills required to be effective postgraduate students.

This subject focuses on developing the academic written and spoken language skills required for postgraduate study in the students' disciplines. These academic skills are developed in the context of students' areas of study and in conjunction with staff from faculties across UTS. Students take a critical/analytical approach to understanding and producing written and spoken texts appropriate for the Australian context. The subject focuses in particular on critical reading skills, paraphrasing and summarising, selecting, evaluating and using a variety of sources of information, developing written arguments, presenting seminars, etc. In this subject, texts are selected and assessment prepared jointly by academic literacy experts and postgraduate coordinators and supervisors in students' faculties.

59312

Postgraduate Academic Writing in Context

8cp; prerequisite(s): 59311 Academic English for Postgraduate Study or equivalent; corequisite(s): enrolled in a postgraduate research degree at UTS

This is the final of three compulsory subjects in the Graduate Certificate in English for Academic Purposes (GCEAP) specifically aimed at international students enrolled in a postgraduate research degree at UTS. The aim of this subject is to provide students with ongoing integrated academic literacy and oracy support during the first semester of their postgraduate studies at UTS.

This subject focuses on consolidating postgraduate international students' academic literacy and oracy skills while they complete the first semester of postgraduate studies at UTS. The subject focuses on advanced skills in reading, text drafting and editing, the development of critical writing skills and the preparation of postgraduate assignments or research documents (articles, conference papers, etc.).

59314

Australian English Language and Culture 1

24cp; 20hpw

This subject enables international students from language backgrounds other than English to develop their English language skills through the study of aspects of contemporary Australian society and culture. Through both class activities and excursions, it introduces students to a range of intercultural issues and provides them with opportunities to interact with native speakers in order to develop the cultural understanding, skills, knowledge and confidence required to use English and participate actively in a variety of settings. The subject focuses particularly on oral skills and includes some participation in mainstream University classes. Students complete a major project using ethnographic research techniques.

59315

Australian English Language and Culture 2

24cp; 20hpw; prerequisite(s): 59314 Australian English Language and Culture 1 or equivalent

This subject continues the language skill development of 59314 Australian English Language and Culture 1 and extends student participation in mainstream University classes. Students complete a number of field projects on topics relating to their own interests or study areas. Lecturers coordinate student progression through these projects through individual and group meetings, presentations by guest speakers, excursions and readings.

59318

Seminar Presentation

6cp; over 10 weeks

This elective is one of five subjects offered by the ELSSA Centre and it is aimed at non-English-speaking-background students who need to develop their seminar presentation skills. It focuses on the analysis of topics relevant to different academic areas of study and the development of seminar presentation skills.

59319

Communication for Employment

6cp; over 10 weeks

This elective is one of five subjects offered by the ELSSA Centre and it is aimed at non-English-speaking-background students who need to develop their employment-seeking skills. It focuses on the analysis of recruitment advertisements relevant to different academic areas of study, and the development of writing and speaking skills required for gaining employment. It also covers work-related communication skills.

59320

English for Business

6cp; over 10 weeks

This elective is one of five subjects offered by the ELSSA Centre and it is aimed at non-English-speaking-background business students who need to develop their written and spoken communication skills. It focuses on the critical analysis of topics relevant to business study, the development of essay outlines, report outlines, seminar structures and the final preparation of an essay, a report and a seminar.

70105

Legal Research

4cp; corequisite(s): 70217 Criminal Law; 70211 Law of Contract
Undergraduate and Postgraduate

This subject aims to familiarise students with the basic tools available to engage in legal research. It includes an introduction to various paper-based resources (citations, digests, etc.).

Students are also introduced to the use of computerised systems as an aid to legal research. The emphasis is on Internet-based systems such as AustLII, Scale Plus and Butterworths Online. CD-ROM products are also briefly covered.

70113

Legal Process and History

10cp; corequisite(s): 70217 Criminal Law; 70211 Law of Contract
Undergraduate and Postgraduate

This subject aims to introduce students to, and to provide students with, a sound working knowledge of the Australian legal and constitutional environment. The subject also aims to equip students with certain legal skills

– in particular, the skills of case analysis, statutory interpretation, legal problem solving and critical analysis – which are essential to the study and practice of the law. Students are asked to consider what is law, who makes law, and how and why the law has developed in the way that it has. They also examine the institutions that make up our legal system – the legislature, the Crown and the executive, the courts and the 'legal players' (the judge, the jury and the legal practitioner) – and explore the principles and doctrines that underpin our legal system. Further, they are asked to consider why our legal system is so different from that of some of our regional neighbours, and to evaluate the strengths and weaknesses of the common law legal system. Valuable insight into the way our legal system operates may be gained through using a historical approach, and this means delving back into English, as well as Australian, legal and constitutional history. Such an approach also facilitates refinement of critical analysis skills. At the end of the subject, students should have a fully developed understanding of the western legal tradition, the place of common law in that system, and the ramifications of living under a Westminster parliamentary system as well as a federal system.

70211

Law of Contract

8cp; prerequisite(s): 70113 Legal Process and History; corequisite(s): 70105 Legal Research
Undergraduate and Postgraduate

This subject deals with the legal principles related to binding promises, the difficulties arising out of their interpretation, how they may become defeasible, issues relating to their performance, and how they may be discharged. Topics covered include the formation of contracts (agreement, consideration, intention, writing); content and construction; vitiating factors (capacity, privity, mistake, misrepresentation, illegality, duress, undue influence, unconscionability); discharge by performance and non-performance of contractual obligations (breach and frustration); and contractual remedies.

70217

Criminal Law

6cp; corequisite(s): 70113 Legal Process and History; 70105 Legal Research
Undergraduate and Postgraduate

This subject deals with the substantive criminal law, the doctrines and rules that define the conditions of criminal liability and some aspects of the procedural law. Australian common law doctrine and the Crimes Act 1900 (NSW) are considered. Topics include the nature of crime; the doctrine of mens rea and actus reus; presumption of innocence; offences against the person; property offences; strict liability; complicity; criminal defences; criminal investigation and procedure; and drug law.

70311

Law of Tort

8cp; prerequisite(s): 70113 Legal Process and History; corequisite(s): 70105 Legal Research
Undergraduate and Postgraduate

This subject discusses the functions and aims of the tort. It then examines the nature of tortious liability in the light of a selection of specific torts, namely, trespass to the person, goods and land; the action on the case for wilful injuries; conversion; negligence; nuisance; and defamation. Reference is also made to defences, vicarious liability and contribution between tortfeasors.

Attention is drawn to the relevance of the type of conduct complained of (intentional, reckless, careless); the nature of the various interests protected (personal security, chattels, land, reputation, economic interests, domestic relations); the adaptability of tort law to changing needs and values of society (thus the introduction, dominance and current perceived limitations of the fault concept); and the element of policy expressed or implied in judicial decisions.

70317

Real Property

8cp; prerequisite(s): 70211 Law of Contract; corequisite(s): 70311 Law of Tort
Undergraduate and Postgraduate

Topics covered include agreements for sale of land; time for completion; Torrens title and priorities; old system, possessory, qualified and limited title; fixtures; trespass to land; co-ownership; easements; covenants; mortgages; and leases.

70318

Personal Property

4cp; prerequisite(s): 70211 Law of Contract; corequisite(s): 70311 Law of Tort
Undergraduate and Postgraduate

Topics covered include classifications of personal property, choses in action and choses in possession; acquisition of title to goods; law of bailment; insurance; securities interests in chattels; and law of negotiable instruments, with particular reference to cheques.

70417

Corporate Law

8cp; corequisite(s): 70317 Real Property
Undergraduate and Postgraduate

The response of the law to the activities of business entities is dealt with in this subject. Although the emphasis is on corporations, there is a brief discussion of the manner in which non-corporate entities including partnerships are regulated. The study of corporations law includes an overview of the historical developments, the current method of regulation and the proposals for reform.

70516

Equity and Trusts

8cp; prerequisite(s): 70317 Real Property; corequisite(s): 70417 Corporate Law 71116 Remedies
Undergraduate and Postgraduate

Equity is a body of rules or principles developed in the Court of Chancery before 1873. The doctrines of equity developed as a response to defects in the English common law system, defects which had resulted in rigidity and inflexibility. A knowledge of the principles of equity is therefore crucial to a complete understanding of the law in those areas of private law, particularly property and contract, where equity intervened to modify the operation of the rules of the common law. In that sense, the doctrines of equity form part of the law of contract and property. The doctrine has also reached into other subject areas including taxation law, corporate law and succession. Equity also developed remedies, such as the injunction, which were unknown to the common law and which have a continuing influence in public law as well as private law.

70616

Federal Constitutional Law

8cp; prerequisite(s): 70113 Legal Process and History; 70105 Legal Research; corequisite(s): 70211 Law of Contract
Undergraduate and Postgraduate

This subject examines the effect of the Australian Constitution on the legal and fiscal relationship of the Commonwealth, States, and Territories. In order that students develop an understanding of the techniques of judicial review in the constitutional context, a range of powers given to the Commonwealth is examined. These include trade and commerce, corporations, taxation and external affairs. Other areas examined are explicit and implicit restrictions of power, the questions of inconsistency and intergovernmental relations. The general role of the High Court in Australian constitutional law is considered, along with the Separation of Powers Doctrine as it relates to the independence of the judiciary.

70617

Administrative Law

8cp; prerequisite(s): 70616 Federal Constitutional Law
Undergraduate and Postgraduate

This subject deals with the supervision of the executive arm of government by the courts and by other statutory mechanisms. Topics include the grounds of review of administrative decisions, in particular natural justice; ultra vires; jurisdictional error and error of law; remedies available at common law upon judicial review, including the prerogative writs and equitable remedies; judicial review under the Administrative Decision (Judicial Review) Act 1976 (Cwlth); a review of Commonwealth decisions under the Administrative Appeals Tribunal Act 1976 (Cwlth); and the role and function of the Ombudsman. If time permits, freedom of information and privacy legislation will also be touched upon, and the role of the Independent Commission Against Corruption (ICAC).

71005

Practice and Procedure

4cp; corequisite(s): 70516 Equity and Trusts
Undergraduate and Postgraduate

Practice and Procedure is a core subject that develops the student's understanding of the process of litigation from the commencement of proceedings through to the final hearings.

Topics include statements of claim in contracts and torts; defence, cross-claims and replies; equitable proceedings; particulars; discovery, inspection and interrogatories; notice of motion; drafting affidavits; subpoenas; and advocacy skills.

71116

Remedies

6cp; corequisite(s): 70516 Equity and Trusts
Undergraduate and Postgraduate

This subject deals with the range of court-ordered remedies available to a plaintiff in civil proceedings. The more common remedies are those administered at either common law or in equity: damages; equitable remedies (declarations, specific performance, injunctions, Anton Pillar orders, account, equitable damages); and statutory and common law remedies for deceptive conduct. Bankruptcy and insolvency is also considered.

71216

Law of Evidence

6cp; prerequisite(s): 70217 Criminal Law; corequisite(s): 70516 Equity and Trusts
Undergraduate and Postgraduate

This subject deals with adjectival law and the determination of how information may be presented to the court in litigation, when such information is admissible in evidence, and how the rules of proof are applied. The inclusionary rule of relevance, the various exclusionary rules (such as hearsay, opinion, tendency, coincidence, credibility, character, privilege), and the judicial discretion to exclude are studied, as well as the incidence of the burden of proof.

79004

Environmental Law and Science

6cp; prerequisite(s): 91102 Functional Biology or equivalent
Undergraduate

This subject explores the interdisciplinary nature of environmental law and the interface between environmental law and science in the context of environmental management and conservation of resources. Topics include, but are not limited to: introduction to environmental law; environmental ethics; principles of sustainability; the role of international conventions and federal, State and local governments; legislative framework of environmental law in Australia; community right to know legislation; use of economic instruments, e.g. tradeable permits and environmental taxes, environmental impact assessment; contaminated land; methods of enforcement; and alternative dispute resolution.

79024

Complex Forensic Cases (Law)

6cp
Undergraduate

Students receive training in the preparation of reports and in the presentation of evidence in court. A substantial component of this subject is a moot court.

79203

Business Law and Ethics

6cp
Undergraduate

Business Law and Ethics provides the fundamental foundation for all future law subjects in the Bachelor of Business. It covers Australian and international commercial relationships in contract and consumer protection, as well as developing laws, such as intellectual property. Students learn legal research techniques involving the Internet and paper-based library resources and focus on skills and developing general principles that can be applied to all areas of law, both now and in the future. In particular, the subject focuses on resolving personal and professional ethical dilemmas, as well as the choice of resolving commercial disputes in and outside the court system.

85208

Reconciliation Studies

6cp
Undergraduate

Reconciliation is a key strategy for a sustainable future for Australia. By reconciliation we mean creating 'a united Australia which respects this land of ours; values the Aboriginal and Torres Strait Islander heritage; and provides justice and equity for all' (Council for Aboriginal Reconciliation, 1992). Reconciliation Studies introduces students to the challenges of this process. Core reconciliation issues are investigated and discussed, drawing on relevant life experiences, academic research and professional practice. Skills in applying reconciliation principles in a professional field, industry or community are developed, including the use of cultural plurality and diversity of perspectives found in reference material and the classroom.

85209

Reconciliation Studies

8cp

Undergraduate

Reconciliation is a key strategy for a sustainable future for Australia. By reconciliation we mean creating 'a united Australia which respects this land of ours; values the Aboriginal and Torres Strait Islander heritage; and provides justice and equity for all' (Council for Aboriginal Reconciliation, 1992). Reconciliation Studies introduces students to the challenges of this process. Core reconciliation issues are investigated and discussed, drawing on relevant life experiences, academic research and professional practice. Skills in applying reconciliation principles in a professional field, industry or community are developed, including the use of cultural plurality and diversity of perspectives found in reference material and the classroom.

85210

Reconciliation Studies

6cp

Postgraduate

Reconciliation is a key strategy for a sustainable future for Australia. By reconciliation we mean creating 'a united Australia which respects this land of ours; values the Aboriginal and Torres Strait Islander heritage; and provides justice and equity for all' (Council for Aboriginal Reconciliation, 1992). Reconciliation Studies introduces students to the challenges of this process. Core reconciliation issues are investigated and discussed, drawing on relevant life experiences, academic research and professional practice. Skills in applying reconciliation principles in a professional field, industry or community are developed, including the use of cultural plurality and diversity of perspectives found in reference material and the classroom.

85211

Reconciliation Studies

8cp

Postgraduate

Reconciliation is a key strategy for a sustainable future for Australia. By reconciliation we mean creating 'a united Australia which respects this land of ours; values the Aboriginal and Torres Strait Islander heritage; and provides justice and equity for all' (Council for Aboriginal Reconciliation, 1992). Reconciliation Studies introduces students to the challenges of this process. Core reconciliation issues are investigated and discussed, drawing on relevant life experiences, academic research and professional practice. Skills in applying reconciliation principles in a professional field, industry or community are developed, including the use of cultural plurality and diversity of perspectives found in reference material and the classroom.

INTERNATIONAL STUDIES SUBJECTS

Language and Culture programs

97x111

Chinese Language and Culture

4 x 8cp

971111, 972111, 973111, 974111

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

The Chinese program is open to students who are either complete beginners, who first learnt Chinese at secondary school level in Australia or who already have a working knowledge of Chinese characters and communicative competence in a Chinese language other than Modern Standard Chinese. There are three points of entry into this program: Chinese Unit 1 for complete beginners; Chinese Unit 3 for students who have successfully completed HSC 2/3-unit Chinese; and Chinese Unit 7 for students who have a working knowledge of Chinese characters, as well as communicative competence in a Chinese language other than Modern Standard Chinese. Students in the combined degree take four consecutive units in the program, usually either units 1–4, 3–6 or 7–10, determined by their point of entry. Other programs may be negotiated according to the student's level of proficiency.

The Chinese language program is designed to provide students with the communicative skills necessary to undertake In-country Study in China. A communicative approach is adopted for classroom instruction and students are expected to participate fully in class activities in the process of acquiring practical language skills. The teaching incorporates an introduction to Chinese culture and helps students to appreciate the wider cultural ramifications of Chinese in various contexts. The program lays a solid foundation for further cultural studies in Chinese.

Chinese Unit 1

8cp; 6hpw; prerequisite: nil

Chinese Unit 1 aims to develop in students a survival communicative ability in basic social interactions. It teaches students Pinyin, the official transcription system, as a guide to the pronunciation of the Chinese language, and some basic structures and devices of the language. Students are expected to know about 300 Chinese characters by the end of this unit.

Chinese Unit 2

8cp; 6hpw; prerequisite: Chinese Unit 1

Chinese Unit 2 continues to develop in students a survival communicative ability in basic social interactions. It also introduces students to some of the basic structures and devices of the language. Students are expected to know about 600–800 Chinese characters by the end of this unit.

Chinese Unit 3

8cp; 6hpw; prerequisite: Chinese Unit 2 or HSC 2/3-unit Chinese

Chinese Unit 3 is the entry point for students who have completed HSC 2/3-unit Chinese and who first learnt Chinese at school in Australia.

Chinese Unit 3 aims to further develop students' oral communicative competence in basic social interactions. More written texts are gradually introduced to enhance the ability of students to use Chinese characters. The basic structures and devices of the language are reinforced. Students are expected to know about 1,200 Chinese characters by the end of this unit.

Chinese Unit 4

8cp; 6hpw; prerequisite: Chinese Unit 3

Chinese Unit 4 is the second unit for students who have completed HSC 2/3-unit Chinese.

Chinese Unit 4 aims to further develop students' communicative competence in basic social interactions. More written texts are introduced to enhance the ability of students to use Chinese characters. The basic structures and devices of the language are also reinforced. Students are expected to know about 1,600 Chinese characters by the end of this unit.

Chinese Unit 5

8cp; 6hpw; prerequisite: Chinese Unit 4

Chinese Unit 5 is the third unit for students who first learnt Chinese at school in Australia and obtained HSC 2/3-unit Chinese.

Chinese Unit 5 aims to further develop students' communicative competence in general social interactions. While reinforcing the macro-skills of reading, writing, listening and speaking, this unit focuses on practical writing skills. Students are expected to know about 2,000 Chinese characters by the end of this unit.

Chinese Unit 6

8cp; 6hpw; prerequisite: Chinese Unit 5

Chinese Unit 6 is the fourth subject for students who have obtained HSC 2/3-unit Chinese with basic communicative skills and the ability to undertake In-country Study in China.

Chinese Unit 6 aims to further develop students' communicative competence in general social interactions. While reinforcing basic structures and devices of the language, this unit further develops students' writing skills. Students are expected to know about 2,500 Chinese characters by the end of this unit.

Chinese Unit 7

8cp; 4hpw; prerequisite: a working knowledge of Chinese characters as well as communicative competence in a Chinese language other than Modern Standard Chinese.

Chinese Unit 7 is for students who have a working knowledge of Chinese characters as well as communicative competence in a Chinese language other than Modern Standard Chinese.

This unit aims to develop communicative competence to meet students' needs in social and professional interactions where Modern Standard Chinese (also known as Mandarin, Putonghua or Guoyu) is used. Simplified characters, pronunciation, intonation and situational Chinese usages are the focus of class instruction.

Chinese Unit 8

8cp; 4hpw; prerequisite: Chinese Unit 7 or equivalent

This unit aims to develop a communicative competence at a more sophisticated level. Students are exposed to a range of Chinese texts in varied sociocultural contexts in order to master the use of Chinese for different purposes, and are provided with opportunities to further improve speaking and listening skills through discussions of the texts and making cross-cultural comparisons.

Chinese Unit 9

8cp; 4hpw; prerequisite: Chinese Unit 8 or equivalent

This unit aims to develop in students a high level of communicative competence required for understanding various electronic and published media articles, correspondence and texts related to contemporary society where Modern Standard Chinese (also known as Mandarin, Putonghua or Guoyu) is used. Students are exposed to a range of Chinese texts in order to master the use of Chinese for different purposes, and are provided with opportunities to maintain speaking and listening skills through discussion of the texts.

Chinese Unit 10

8cp; 4hpw; prerequisite: Chinese Unit 9 or equivalent

This unit aims to further develop in students a high level of communicative competence in reading and writing to meet students' needs in social and professional interactions. Modern Standard Chinese (also known as Mandarin, Putonghua or Guoyu) is used. Students are exposed to a range of diverse texts from modern Chinese literature, history, language and culture in order to master the use of written Chinese for different purposes, and are provided with further opportunities to maintain speaking and listening skills through discussion of the texts.

97x411

French Language and Culture

4 x 8cp

971411, 972411, 973411, 974411

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

The French language program is for students who are either complete beginners or who first learnt French at school. There are two points of entry: the first for complete beginners; the second for students who have successfully completed HSC 2/3-unit French, or its equivalent. Students in the combined degree take four units in the program, either units 1–4 (beginners) or 3–6 (post-HSC), determined by their point of entry. Students with a language competence in French that is higher than the program may be able to undertake further studies in French at other universities in the Sydney area through arrangements made by the Institute.

The language program covers a broad range of communicative situations relevant to daily interaction in French. The focus is on the development of speaking, listening, reading and writing skills appropriate to the situations that students are likely to encounter. Vocabulary and grammar cover a range of themes and are presented using written and audiovisual materials.

Upon successful completion of the program, students are expected to be able to communicate about familiar things, events and opinions and to have developed skills and strategies for continuing their learning of the language in French-speaking environments. Those students with prior knowledge of French entering the program at a higher level are expected to communicate comfortably on a wide range of topics, with the ability to adjust their language according to social variables such as formality, age and status. Each unit is covered in 13 weeks in one semester. There are six hours of language classes per week. Some of the class time may be conducted in the Learning Resources Centre using computers and the language laboratory.

French Unit 1

8cp; 1st semester, 6hpw; prerequisite: nil

French Unit 1 is the first in a series of four units designed to provide students who have no prior knowledge of the French language with basic survival skills in language and culture, and the ability to undertake In-country Study in France.

By the end of the unit, students are expected to have achieved 'elementary proficiency' and be able to satisfy immediate communication needs required in basic social interaction, using expressions and phrases they have learnt. The program allows for the development of listening, speaking, reading and writing skills, and an understanding of the sociocultural contexts in which the language is used. In particular, students gain an awareness of the background of French-speaking countries. Students also develop strategies for predicting the meaning of new expressions and anticipating ways to express new meanings.

The approach adopted is communicative and provides students with many opportunities to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

French Unit 2

8cp; 2nd semester, 6hpw; prerequisite: French Unit 1 or equivalent

French Unit 2 is the second in a series of four units designed to provide students who have no prior knowledge of the French language with basic survival skills in language and culture, and the ability to undertake In-country Study in France.

By the end of the unit, students are expected to have achieved 'minimum survival proficiency' in speaking, listening, reading and writing and be able to satisfy immediate communication needs and minimum courtesy requirements required in basic social interaction. Students also develop an understanding of the sociocultural contexts in which the language is used and develop further communication strategies.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

French Unit 3

8cp; 1st semester, 6hpw; prerequisite: French Unit 2, HSC French, or equivalent

French Unit 3 is the third in a series of four units for students with no prior knowledge of the French language, or the first in a series of four units for students who have successfully completed HSC 2/3-unit French, or its equivalent. It provides students with basic survival skills in French language and culture, and the ability to undertake In-country Study in France.

By the end of the unit, students are expected to have achieved communicative competence in speaking, listening, reading and writing skills to be able to satisfy all 'survival' needs and limited social needs. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. In this unit, students develop the ability to understand the general content of magazine and newspaper articles.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

French Unit 4

8cp; 2nd semester, 6hpw; prerequisite: French Unit 3 or equivalent

French Unit 4 is the fourth in a series of four units for students with no prior knowledge of the French language, or the second in a series of four units for students who have successfully completed French Unit 3, HSC 2/3-unit French, or its equivalent; and equips these students with basic survival skills in French language and culture and the ability to undertake In-country Study in France.

By the end of the unit, students are expected to have begun to develop the communication skills required to satisfy limited routine social or work demands related to the situation covered. Students would also have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to express opinions, discuss education, entertainment and travel, and develop the language skills and background knowledge required to find accommodation.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

French Unit 5

8cp; 1st semester, 6hpw; prerequisite: French Unit 4 or equivalent

French Unit 5 is the third in a series of four units designed to provide students who have successfully completed French Unit 4, HSC 2/3-unit French, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in France.

By the end of the unit, students are expected to have achieved the communicative competence required to satisfy routine social demands and limited work requirements in speaking, listening, reading and writing skills. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to communicate in French and to compare lifestyles, university life and education and practice interview techniques in preparation for In-country Study.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

French Unit 6

8cp; 2nd semester, 6hpw; prerequisite: French Unit 5 or equivalent

French Unit 6 is the fourth in a series of four units designed to provide students who have successfully completed French Unit 5, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in France.

By the end of the unit, students are expected to have achieved the communicative competence required for limited formal and informal conversations on practical and social topics. Students are also expected to have developed the ability to read and write with sufficient accuracy to meet a limited range of social needs and limited work needs. Language development focuses on topics such as economy, class and social stratification, gender roles, religion and beliefs, literature and the arts.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

French Unit 7

8cp; 1st semester, 4hpw; prerequisite: French Unit 6

French Unit 7 is designed to provide students who have successfully completed French Unit 6, or its equivalent, with the ability to consolidate and extend their knowledge of French in preparation for a period of In-country Study in France.

By the end of the unit, students are expected to be able to communicate confidently in French in a wide variety of everyday situations, and to have comprehension skills which enable them to read a wide variety of authentic materials in French. Students are expected to extend their knowledge of present-day French society and culture and to have acquired the vocabulary and linguistic structures necessary to participate in formal and informal conversations with considerable accuracy.

The classroom approach provides students with opportunities to further develop their vocabulary, fluency and accuracy as they use French to respond to authentic texts and to discuss set topics. Students are required to read extensively in preparation for classroom presentations and discussions.

French Unit 8

8cp; 2nd semester, 4hpw; prerequisite: French Unit 7

French Unit 8 is designed to provide students who have successfully completed French Unit 7, or its equivalent, with the ability to consolidate and extend their knowledge of French in preparation for a period of In-country Study in France.

By the end of the unit, students are expected to demonstrate the linguistic skills and cultural awareness required to engage appropriately in a range of formal and informal discussions in social, professional and educational contexts.

The classroom approach provides students with opportunities to further develop their vocabulary, fluency and accuracy as they use French to discuss set topics and to respond to authentic texts, television programs and films. Students are required to read extensively in preparation for classroom presentations and discussions.

97x421

German Language and Culture

4 x 8cp

971421, 972421, 973421, 974421

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

The German language program is for students who are either complete beginners or who first learnt German at school. There are two points of entry: the first for complete beginners; the second for students who have successfully completed HSC 2/3-unit German, or its equivalent. Students in the combined degree take four units in the program, either units 1–4 (beginners) or 3–6 (post-HSC), determined by their point of entry. Students with a language competence in German that is higher than the usual level accepted in the program may be able to undertake further studies in German at other universities in the Sydney area through arrangements made by the Institute.

The language program covers a broad range of communicative situations relevant to daily interaction in German. The focus is on the development of speaking, listening, reading and writing skills appropriate to the situations that students are likely to encounter. Vocabulary and grammar cover a range of themes.

Upon successful completion of the program, students are expected to be able to communicate about familiar things, events and opinions and to have developed skills and strategies for continuing their learning of the language in German-speaking environments. Those students with prior knowledge of German entering the program at a higher level are expected to communicate comfortably on a wide range of topics, with the ability to adjust their language according to social variables such as formality, age and status. Each unit is covered in 13 weeks in one semester. There are six hours of language classes per week. Some of the class time may be conducted in the Learning Resources Centre using computers and the language laboratory.

German Unit 1

8cp; 1st semester, 6hpw; prerequisite: nil

German Unit 1 is the first in a series of four units designed to provide students who have no prior knowledge of the German language with basic survival skills in German language and culture, and the ability to undertake In-country Study in Germany.

By the end of the unit, students are expected to have achieved 'elementary proficiency' and be able to satisfy immediate communication needs required in basic social interaction, using expressions and phrases they have learnt. The program allows for the development of listening, speaking, reading and writing skills, and an understanding of the sociocultural contexts in which the language is used. Students gain, in particular, an awareness of the background of German-speaking countries. Students also develop strategies for predicting the meaning of new expressions and anticipating ways of expressing new meanings.

The approach adopted is communicative and provides students with many opportunities to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

German Unit 2

8cp; 2nd semester, 6hpw; prerequisite: German Unit 1 or equivalent

German Unit 2 is the second in a series of four units designed to provide students with no prior knowledge of the German language with basic survival skills in German language and culture, and the ability to undertake In-country Study in Germany.

By the end of the unit, students are expected to have achieved 'minimum survival proficiency' in speaking, listening, reading and writing and be able to satisfy immediate communication needs and minimum courtesy requirements required in basic social interaction. Students also develop an understanding of the sociocultural contexts in which the language is used and further communication strategies.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. Audiovisual equipment and computers may be used to facilitate learning.

German Unit 3

8cp; 1st semester, 6hpw; prerequisite: German Unit 2, HSC German, or equivalent

German Unit 3 is the third in a series of four units for students with no prior knowledge of the German language, or the first in a series of four units for students who have successfully completed HSC 2/3-unit German, or its equivalent. It provides students with basic survival skills in German language and culture and the ability to undertake In-country Study in Germany.

By the end of the unit, students are expected to have achieved the communicative competence in speaking, listening, reading and writing skills to be able to satisfy all 'survival' needs and limited social needs. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. In this unit, students also develop the ability to understand the general content of magazine and newspaper articles.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

German Unit 4

8cp; 2nd semester, 6hpw; prerequisite: German Unit 3 or equivalent

German Unit 4 is the fourth in a series of four units for students with no prior knowledge of the German language, or the second in a series of four units for students who have successfully completed German Unit 3, HSC 2/3-unit German, or its equivalent. It provides them with basic survival skills in German language and culture and the ability to undertake In-country Study in Germany.

By the end of the unit, students are expected to have begun to develop the communication skills required to satisfy limited routine social and work demands related to the situation covered. Students would also have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to express opinions, discuss education, entertainment and travel, and develop the language skills and background knowledge required to find accommodation.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

German Unit 5

8cp; 1st semester, 6hpw; prerequisite: German Unit 4 or equivalent

German Unit 5 is the third in a series of four units designed to provide students who have successfully completed German Unit 4, HSC 2/3-unit German, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in Germany.

By the end of the unit, students are expected to have achieved the communicative competence required to satisfy routine social demands and limited work requirements in speaking, listening, reading and writing skills. Students would have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to communicate in German when comparing lifestyles, university life and education and to practice interview techniques in preparation for In-country Study.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

German Unit 6

8cp; 2nd semester, 6hpw; prerequisite: German Unit 5 or equivalent

German Unit 6 is the fourth in a series of four units designed to provide students who have successfully completed German Unit 5, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in Germany.

By the end of the unit, students are expected to have achieved the communicative competence required to speak the language with reasonable accuracy, and to be able to participate readily in limited formal and informal conversations on practical and social topics. Students are also expected to have developed the ability to read and write with sufficient accuracy to meet a limited range of social needs and limited work needs. Language focuses on topics such as the economy, class and social stratification, gender roles, religion and beliefs, and literature and the arts.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

German Unit 7

4cp; 1st semester, 4hpw; prerequisite: German Unit 6

German Unit 7 is designed to provide students who have successfully completed German Unit 6, or its equivalent, with the ability to consolidate and extend their knowledge of the German language in preparation for a period of In-country Study in Germany.

By the end of the unit, students are expected to be able to communicate confidently and with a high level of accuracy in German in a wide range of formal and informal conversations, and to have comprehension skills which enable them to read a wide variety of authentic materials in German. Students are expected to be able to read and write for academic and general purposes with sufficient accuracy to meet a wide range of social and academic needs.

The classroom approach provides students with opportunities to further develop their vocabulary, fluency and accuracy as they use German to respond to authentic texts and to discuss set topics. Students are required to read extensively in preparation for classroom presentations and discussions.

German Unit 8

4cp; 2nd semester, 4hpw; prerequisite: German Unit 7

German Unit 8 is designed to provide students who have successfully completed German Unit 7, or its equivalent, with the ability to consolidate and extend their knowledge of German in preparation for a period of In-country Study in Germany.

By the end of the unit, students are expected to have achieved a high level of proficiency and speak the language with a high level of accuracy. They are able to participate in a wide range of formal, informal and academic conversations on topics such as the economy, gender roles, social life, politics and current issues. They also learn about academic writing and develop academic skills such as note taking and essay writing in German. They are expected to read and write academic and general texts with a high degree of accuracy to meet a wide range of social and academic needs.

The classroom approach provides students with opportunities to further develop their vocabulary, fluency and accuracy as they use German to discuss set topics and to respond to authentic texts, television programs and films. Students are required to read extensively in preparation for classroom presentations and discussions.

97x710

Greek

4 x 8cp

971710, 972710, 973710, 974710

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The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

Greek is offered to UTS students through arrangements with other universities. Students are placed in classes appropriate to their level of competence. The program focuses on furthering writing and oral skills in contemporary Greek and learning about Hellenic literature, society and culture.

97x311

Indonesian Language and Culture

4 x 8cp

971311, 972311, 973311, 974311

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

Indonesian is offered to UTS students through arrangements with other universities. Students are placed in classes appropriate to their level of competence. The aim of the Indonesian language program is to give students a good working knowledge of modern written and spoken Indonesian and to enable them to express themselves in the language correctly and with reasonable clarity.

97x431

Italian Language and Culture

4 x 8cp

971431, 972431, 973431, 974431

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

The Italian language program is for students who are either complete beginners or who first learnt Italian at school. There are two points of entry: the first for complete beginners; the second for students who have successfully completed HSC 2/3-unit Italian, or its equivalent. Students in the combined degree take four units in the program, either units 1–4 (beginners) or 3–6 (post-HSC), determined by their point of entry. Students with a language competence in Italian that is higher than the program may be able to undertake further studies in Italian at other universities in the Sydney area through arrangements made by the Institute.

The language program covers a broad range of communicative situations relevant to daily interaction in Italian. The focus is on the development of speaking, listening, reading and writing skills appropriate to the situations that students are likely to encounter. Vocabulary and grammar cover a range of themes and are presented using written and audiovisual materials.

Upon successful completion of the program, students are expected to be able to communicate about familiar things, events and opinions and to have developed skills and strategies for continuing their learning of the language in Italian-speaking environments. Those students with prior knowledge of Italian, who are entering the program at a higher level, are expected to communicate comfortably on a wide range of topics, with the ability to adjust their language according to social variables such as formality, age and status. Each unit is covered in 13 weeks in one semester. There are six hours of language classes per week.

Italian Unit 1

8cp; 1st semester, 6hpw; prerequisite: nil

Italian Unit 1 is the first in a series of four units designed to provide students who have no prior knowledge of the Italian language with basic survival skills in Italian language and culture, and the ability to undertake In-country Study in Italy.

By the end of the unit, students are expected to have achieved 'minimum creative proficiency' and be able to satisfy immediate communication needs required in basic social interaction, using expressions and phrases they have learnt. The program allows for the development of listening, speaking, reading and writing skills, and an understanding of the sociocultural contexts in which the language is used. In particular, students gain an awareness of the background of Italian-speaking countries. Students also develop strategies for predicting the meaning of new expressions and anticipating ways of expressing new meanings.

The approach adopted is communicative and provides students with many opportunities to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Italian Unit 2

8cp; 2nd semester, 6hpw; prerequisite: Italian Unit 1 or equivalent

Italian Unit 2 is the second in a series of four units designed to provide students who have no prior knowledge of the Italian language with basic survival skills in Italian language and culture, and the ability to undertake In-country Study in Italy.

By the end of the unit, students are expected to have achieved 'basic transactional proficiency' in speaking, listening, reading and writing, and be able to satisfy immediate communication needs and minimum courtesy requirements for basic social interaction. Students also develop an understanding of the sociocultural contexts in which the language is used and further communication strategies.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Italian Unit 3

8cp; 1st semester, 6hpw; prerequisite: Italian Unit 2, HSC Italian, or equivalent

Italian Unit 3 is the third in a series of four units for students with no prior knowledge of the Italian language, or the first in a series of four units for students who have successfully completed HSC 2/3-unit Italian, or its equivalent. It provides them with basic survival skills in Italian language and culture and the ability to undertake In-country Study in Italy.

By the end of the unit, students are expected to have achieved the communicative competence in speaking, listening, reading and writing skills to be able to satisfy all 'survival' needs and limited social needs. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. In this unit, students also develop the ability to understand the general content of magazine and newspaper articles.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Italian Unit 4

8cp; 2nd semester, 6hpw; prerequisite: Italian Unit 3 or equivalent

Italian Unit 4 is the fourth in a series of four units for students with no prior knowledge of Italian language, or the second in a series of four units for students who have successfully completed Italian Unit 3, HSC 2/3-unit Italian, or its equivalent. It provides them with basic survival skills in Italian language and culture and the ability to undertake In-country Study in Italy.

By the end of the unit, students are expected to have begun to develop the communication skills required to satisfy limited routine social and work demands related to the situation covered. Students would also have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to express opinions, discuss education, entertainment and travel, and develop the language skills and background knowledge required, e.g. to find accommodation.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Italian Unit 5

8cp; 1st semester, 6hpw; prerequisite: Italian Unit 4 or equivalent

Italian Unit 5 is the third in a series of four units designed to provide students who have successfully completed Italian Unit 4, HSC 2/3-unit Italian, or its equivalent, with the ability to consolidate and extend their knowledge of the Italian language and culture during a period of In-country Study in Italy.

By the end of the unit, students are expected to have achieved the communicative competence required to satisfy routine social demands and limited work requirements in speaking, listening, reading and writing skills. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to communicate in Italian while comparing lifestyles, university life and education and practice interview techniques in preparation for In-country Study.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

Italian Unit 6

8cp; 2nd semester, 6hpw; prerequisite: Italian Unit 5 or equivalent

Italian Unit 6 is the fourth in a series of four units designed to provide students who have successfully completed Italian Unit 5, or its equivalent, with the ability to consolidate and extend their knowledge of the Italian language and culture during a period of In-country Study in Italy.

By the end of the unit, students are expected to have achieved the communicative competence required to speak the language with sufficient accuracy for limited formal and informal conversations on practical and social topics. Students are also expected to be able to read and write with sufficient accuracy to meet a limited range of social needs and limited work needs. Language focuses on topics such as the economy, class and social stratification, gender roles, religion and beliefs, literature and the arts.

The approach adopted is communicative and provides many opportunities for students to interact and use the language in a meaningful way in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

97x211

Japanese Language and Culture

4 x 8cp

971211, 972211, 973211, 974211

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

The Japanese language program comprises six units offered in two main streams: beginners and post-HSC. There are two main points of entry into the Japanese Language and Culture program. Students with no prior experience of the language enter the program at Japanese Unit 1, while students with HSC-level Japanese or equivalent are required to enter the program at the post-HSC level (Japanese 3).

The program enables students to develop the skills to communicate in everyday situations in order to live, study and work in a Japanese-speaking environment; or interact with Japanese people in a social, university or work-related context. The emphasis is on the development of communication skills, particularly speaking and listening, with an increased focus on reading and writing skills at the post-HSC level. The study of sociocultural aspects of Japan is an integrated and essential part of the language program.

Japanese Unit 1

8cp; 6hpw; prerequisite: nil

This is the first subject in the Japanese Language and Culture program. It is designed as the first step in providing students who have no prior knowledge of Japanese with the basic language survival skills and sociocultural awareness to enable them to undertake In-country Study in Japan.

While focusing primarily on the development of speaking and listening skills, this subject also provides a working knowledge of the hiragana and katakana scripts and approximately 50 kanji. Sociocultural aspects are integrated into the program as they relate to the need for students to learn to use the language appropriately in various social and cultural contexts.

Japanese Unit 2

8cp; 6hpw; prerequisite: Japanese Unit 1

This is the second in a series of four units for students with no prior knowledge of the Japanese language. By the completion of this unit, the student should be able to demonstrate the language and sociocultural skills required to establish and maintain relationships in social or work-related spheres, and fulfil basic survival needs in a Japanese-speaking environment.

Emphasis is given to the development of speaking and listening skills, but students also further develop their reading and writing skills. Besides kana, they will know approximately 150 kanji by the end of the unit. Sociocultural aspects are integrated into the program as they relate to the need for students to learn to use the language appropriately in various social and cultural contexts.

Japanese Unit 3

8cp; 6hpw; prerequisite: Japanese Unit 2 or HSC Japanese

Japanese 3 is the third in a series of four units for students with no prior knowledge of the Japanese language, or the first in a series of four units for students who have successfully completed HSC-level Japanese. By the end of the unit, students are expected to have achieved 'survival proficiency' in the use of the language, and be able to satisfy survival needs and limited social demands relating to topics and situations covered.

At the end of the subject, students are expected to have developed their listening, speaking, reading and writing skills to a level where they can communicate in everyday situations, and are able to demonstrate an awareness of the social implications of language and behaviour.

It is expected that students know approximately 250 kanji by the end of the unit.

Japanese Unit 4

8cp; 6hpw; prerequisite: Japanese Unit 3

Japanese 4 is the fourth in a series of four units for beginners. It is also the second in a series of four units for those who have successfully completed HSC-level Japanese, or its equivalent, and aim to further develop Japanese listening, speaking, reading and writing skills. By the end of the unit, students are expected to have achieved 'limited social proficiency', and be able to interact in limited social, study and work contexts with Japanese speakers in Japan or Australia. They will also have learnt approximately 350 kanji.

Japanese Unit 5

8cp; 6hpw; prerequisite: Japanese Unit 4

Japanese 5 is the third in a series of four units in the post-HSC series, and is for those who have successfully completed either Japanese Unit 4, or its equivalent, and aim to further develop listening, speaking, reading, writing and cultural skills. By the end of the unit, students are expected to have achieved 'limited social proficiency', and be able to satisfy routine social and limited work demands. The emphasis is on the development of the language and of the cultural sensitivity required in both formal and informal situations. By the end of the subject, students are expected to be able to read and write approximately 470 kanji.

Japanese Unit 6

8cp; 6hpw; prerequisite: Japanese Unit 5

Japanese Unit 6 is the fourth in a series of four units in the post-HSC series and is for those who have successfully completed either Japanese Unit 5, or its equivalent. By the end of this subject, students are expected to have achieved 'minimal vocational proficiency', and be able to speak the language with sufficient structural accuracy and vocabulary to participate effectively in many formal and informal conversations on practical, social and limited vocational topics. The emphasis is on the development of the language and of the cultural sensitivity required in both formal and informal situations. By the end of the subject, students should be able to read simple prose and read and write approximately 600 kanji.

Japanese Unit 7

8cp; 4hpw; prerequisite: Japanese Unit 6

Japanese Unit 7 is designed to provide students who have successfully completed Japanese Unit 6 or its equivalent with the ability to consolidate and extend their knowledge of Japanese.

Students are expected to continue to develop communication skills required to function effectively in academic and vocational contexts in Japan. In the first half of the unit, the focus is on the development of academic reading and writing skills and the acquisition of vocabulary based on reading, understanding and discussing various topics and viewpoints on the interrelationship between Japanese language and culture. In the second half of the unit, the focus is on workplace communication and the comprehension of university lectures in Japan, with an emphasis on the development of listening and note-taking skills. In terms of literacy development, students will be expected to be able to recognise and pronounce the kanji introduced in the prescribed texts, to have increased their pace of reading as a result of regular and habitual reading and improved dictionary skills, and to be able to write an increasing number of kanji as required for specific academic tasks.

97x331

Malaysian Language and Culture

4 x 8cp

971331, 972331, 973331, 974331

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

Malaysian is offered to UTS students through arrangements with other universities. Students are placed in classes appropriate to their level of competence. The aim of the Malaysian language program is to give students a good working knowledge of modern written and spoken Malaysian and to enable them to express themselves in the language correctly and with reasonable clarity.

97x734

Russian

4 x 8cp

971734, 972734, 973734, 974734

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

Russian is offered to UTS students through an arrangement with other universities. Students are placed in classes appropriate to their level of competence. The aim of the Russian language program is to give students a good working knowledge of modern written and spoken Russian and to enable them to express themselves in the language correctly and with reasonable clarity.

97x501

Spanish Language and Culture

4 x 8cp

971501, 972501, 973501, 974501

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

The Spanish language program is designed for students who are either complete beginners or who first learnt Spanish at school in Australia. There are two points of entry: the first for complete beginners and the second for students who have successfully completed HSC-level Spanish or its equivalent. Students in the combined degree take four units in the program, either units 1–4 (beginners) or 3–6 (post-HSC), determined by their point of entry.

The language program covers a broad range of communicative situations relevant to daily interaction in Spanish. The focus is on the development of speaking, listening, reading and writing skills appropriate to the situations that students are likely to encounter. Vocabulary and grammar are taught using written and audiovisual materials that cover a range of themes and situations.

Upon successful completion of the program, students are expected to be able to communicate about familiar things, events and opinions, and to have developed skills and strategies for continuing their learning of the language in Spanish-speaking countries. Those students with prior knowledge of Spanish, who enter the program at a higher level, are expected to be able to communicate comfortably on a wide range of themes, with the ability to adjust their language according to social variables such as formality, age and status. Each subject is covered in 13 weeks in one semester. There are six hours of language classes per week.

Spanish Unit 1

8cp; 1st semester, 6hpw; prerequisite: nil

Spanish Unit 1 is the first in a series of four units designed to provide students who have no prior knowledge of the Spanish language with basic survival skills in the language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the subject, students are expected to have achieved 'elementary proficiency' and be able to satisfy immediate communication needs required in basic social interaction, using expressions and phrases they have learnt. The program allows for the development of listening, speaking, reading and writing skills, and an understanding of the sociocultural contexts in which the language is used. Students gain, in particular, an awareness of the background of Hispanic countries. Students also develop strategies for predicting the meaning of new expressions and anticipating ways they might express new meanings.

Spanish Unit 1 consists of 78 hours of classroom instruction. The approach adopted is communicative and provides students with many opportunities to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Spanish Unit 2

8cp; 2nd semester, 6hpw; prerequisite: Spanish Unit 1

Spanish 2 is the second in a series of four units designed to provide students who have no prior knowledge of the Spanish language with basic survival skills in the language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the subject, students are expected to have achieved 'minimum survival proficiency' in speaking, listening, reading and writing, and be able to satisfy immediate communication needs and minimum courtesy requirements in basic social interactions. Students also develop an understanding of the sociocultural contexts in which the language is used and further communication strategies.

Spanish Unit 2 consists of 78 hours of classroom instruction. The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Spanish Unit 3

8cp; 1st semester, 6hpw; prerequisite: Spanish Unit 2 or HSC Spanish

Spanish Unit 3 is the third in a series of four units for students with no prior knowledge of the Spanish language, or the first in a series of four units for students who have successfully completed HSC-level Spanish, or its equivalent. It provides students with basic survival skills in the language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the unit, students are expected to have achieved a communicative competence in speaking, listening, reading and writing skills in order to be able to satisfy all 'survival' needs and limited social needs. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. In this unit, students also develop the ability to understand the general content of magazine and newspaper articles.

Spanish Unit 3 consists of 78 hours of classroom instruction. The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Spanish Unit 4

8cp; 2nd semester, 6hpw; prerequisite: Spanish Unit 3

Spanish Unit 4 is the fourth in a series of four units for students with no prior knowledge of the Spanish language, or the second in a series of four units for students who have successfully completed Spanish Unit 3 and HSC-level Spanish, or its equivalent. It provides students with basic survival skills in the language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the unit, students are expected to have begun to develop the communication skills required to satisfy limited routine social and work demands. They are also expected to have developed an awareness of the various social and cultural contexts in which the language is used. In this subject, students learn to express opinions, discuss education, entertainment and travel, and develop the language skills and background knowledge required, e.g. to find accommodation.

Spanish Unit 4 consist of 78 hours of classroom instruction. The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers are used to facilitate learning.

Spanish Unit 5

8cp; 1st semester, 6hpw; prerequisite: Spanish Unit 4

Spanish Unit 5 is the third in a series of four units designed to provide students who have successfully completed Spanish Unit 4 and HSC-level Spanish, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in Latin America or Spain.

By the end of the unit, students are expected to have achieved communicative competence in speaking, listening, reading and writing, and to be able to satisfy routine social demands and limited work requirements. They would have developed an awareness of the various social and cultural contexts in which the language is used. Students learn to communicate in Spanish to compare lifestyles, university life and education, and practise interview techniques in preparation for In-country Study.

Spanish Unit 5 consists of 78 hours of classroom instruction. The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

Spanish Unit 6

8cp; 2nd semester, 6hpw; prerequisite: Spanish Unit 5

Spanish Unit 6 is the fourth in a series of four units designed to provide students who have successfully completed Spanish Unit 5 and HSC-level Spanish, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in Latin America or Spain.

By the end of the unit, students are expected to be able to speak the language with sufficient accuracy, and to participate in limited formal and informal conversations on practical and social topics. Students are also expected to be able to read and write with sufficient accuracy to meet a limited range of social and work needs. Language focuses on topics such as the economy, class and social stratification, gender roles, religion and beliefs, literature and the arts.

Spanish Unit 6 consists of 78 hours of classroom instruction. The approach adopted is communicative and provides many opportunities for students to interact and use the language in various social and cultural contexts. There are discussions and debates on set topics. Audiovisual equipment and computers are used to facilitate learning.

Spanish Unit 7

8cp; 1st semester, 6hpw; prerequisite: Spanish Unit 6

Spanish Unit 7 is designed to provide students who have successfully completed Spanish Unit 6, or its equivalent, with the ability to consolidate and extend their knowledge during a period of In-country Study in Latin America or Spain.

By the end of the unit students are expected to be able to communicate confidently in Spanish within a wide range of everyday situations, and to have further improved their comprehension skills by reading a wide variety of authentic materials in Spanish. Students are also expected to have extended their knowledge of today's world-wide Hispanic society and culture and to have acquired the vocabulary and structures necessary to be able to discuss and write about the cultural context of texts with considerable accuracy.

The approach provides students with opportunities to further develop their vocabulary, fluency and accuracy as they use the language to respond to authentic texts and to discuss set topics. Students are required to read extensively during self-study periods in preparation for classroom presentation and discussion.

Spanish Unit 8

8cp; 2nd semester, 6hpw; prerequisite: Spanish Unit 7

Spanish Unit 8 is designed to provide students who have successfully completed Spanish Unit 7, or its equivalent, with a higher level of communicative and cultural competence, and the ability to consolidate and extend their knowledge during a period of In-country Study in Latin America or Spain.

By the end of the unit, students are expected to have further developed the linguistic and cultural awareness skills required to engage appropriately in a range of formal and informal discussions at a social and professional level on topics such as employment, job applications, academic presentations and university life, social welfare, human rights, leisure and sport, the media, family roles and relationships, etiquette, and immediate concerns such as arranging accommodation and banking.

The approach provides students with opportunities to further develop their vocabulary, fluency and accuracy in speaking and writing as they use the language in response to authentic texts such as newspaper, and magazine articles and television programs in Spanish. Students are required to read extensively during self-study periods in preparation for classroom presentations, debates and discussions.

97x320

Thai

4 x 8cp

971320, 972320, 973320, 974320

The above subject numbers indicate the sequence order of language and culture subjects studied at UTS. The first language and culture subject studied, regardless of the level at which you study it, has 1 as the third digit of the subject number; the second subject studied has 2 as the third digit of the subject number; and so on.

The subject number does not indicate the level at which you study the language and culture subject. To determine the level at which you study, contact the Institute for International Studies.

Thai is offered to UTS students through the language program offered by the University of Sydney. The aim of the Thai language program is to give students a good working knowledge of modern written and spoken Thai and to enable them to express themselves in the language correctly and with reasonable clarity.

Contemporary Society subjects

976111

Contemporary China

8cp; 4hpw

Semester offered: 2nd semester

This subject deals with the politics of 'reading and writing' the People's Republic of China (PRC). The first half of the subject examines the history of the PRC, from the Chinese Communist Party's (CCP) rise to power in 1949 to the death of Chairman Mao Zedong in 1976. A key focus is how the early CCP leadership attempted to resolve an issue that stalks the Chinese government even today, namely, the question of how to modernise China and still keep faith with the ethical imperatives of socialist transition. The course examines how Western commentators and mainland Chinese scholars have chosen to evaluate the Chinese revolution in different historical periods. The second half of the course outlines some of the enormous changes that have taken place in the PRC since the introduction of market-based reforms in 1979. With the implementation of Deng Xiaoping's economic reforms and Open Door policy, China entered the postmodern, global community and now faces similar social concerns to those that inform Western societies – inflation, unemployment, growing crime rates, HIV/AIDS, prostitution and drugs, etc. However, following the Chinese government's brutal suppression of the student protest movement in 1989, the PRC's response to many of these issues has been accompanied by Western accusations of human rights abuses and claims that the CCP has failed to abandon the 'totalitarian' politics of the now denigrated Maoist era. The subject concludes by asking students to determine whether such claims are justifiable or whether it might be more analytically productive to read and write present-day China differently.

976211

Contemporary Japan

8cp; 4hpw

Semester offered: 2nd semester

This subject provides an introduction to the dynamics of political, social and economic systems in modern Japan. Central themes are the causes and consequences of social change and continuity in the context of Japan's emergence as an economic superpower. In the process, it offers a general introduction to Japan's culture. This subject requires no prior knowledge of Japan or of Japanese.

976301

Contemporary South-East Asia

8cp; 4hpw
Semester offered: 2nd semester

This subject provides an introduction to the countries of Indonesia, Malaysia, Thailand and Vietnam. The themes of modernity and identity are examined at a political-economic level and also at an individual level. Issues which are explored include: migration patterns in the context of regional interrelationships; increasing urbanisation; legacies of colonialism; the commodification of culture and the growing impact of tourism; new creative forms in the visual, literary and performing arts; the beliefs about and behaviour of women in the region; and ways in which religion and social practice intersect.

976401

Contemporary Europe

8cp; 4hpw
Semester offered: 2nd semester

This subject is an introduction and an overview laying the groundwork for the study of contemporary Europe and individual countries within Europe. It aims to provide students with a basic understanding of contemporary European history, politics, society and culture, as well as national convergences and divergences in these areas. In particular, it aims to provide students with the critical skills that allow them to identify major contemporary issues in the European region of the world, and beyond it. Insights are gained into Europe's national and regional diversity and heterogeneity in national, continental and international contexts. This gives students the opportunity to develop a critical appreciation for societies outside Australia. Students are exposed to ideas that challenge Eurocentric modes of thinking, and that also draw attention to the legacies of imperialism, colonisation, and transnational capitalism and their impact on contemporary European peoples, wherever they may reside. Students develop critical thinking skills relevant to the multidisciplinary nature of the subject.

976501

Contemporary Latin America

8cp; 4hpw
Semester offered: 2nd semester

Latin America has been a crucible for social, political and economic change in the 19th and 20th centuries. Intense struggles for nationhood, democracy, economic modernisation and secularisation have all resonated in the countries of Latin America. During the middle of the 20th century, Latin America's primary concerns were focused on national self-determination, inward industrialisation and populist authoritarian efforts to legitimise elite rule. In the late 20th century, the emphasis shifted towards economic growth, internationalisation, and pressures to improve the capacity and accountability of governments. The unit aims to provide students with the historical background, cultural awareness and analytic skills to interpret everyday social, political and economic reality during their period of In-country Study. The subject requires no prior knowledge of Latin America or of Spanish.

In-country Study subjects

977xxx

In-country Study 1

24cp; prerequisite(s): completion of relevant subjects appropriate to the student's International Studies major

In-country Study subjects are only available to students doing the Bachelor of Arts in International Studies.

As part of the International Studies combined degrees, students spend two semesters of In-country Study at a university or institution of higher education overseas. The location is determined by the student's International Studies major.

In the International Studies program, students focus on one of the following countries or majors: Canada (Quebec), Chile, China, France, Germany, Indonesia, Italy, Japan, Latino Studies (USA), Malaysia, Mexico, Spain, Switzerland and Thailand. There is also a Heritage major that permits students with previous exposure to a language and culture to continue their study in countries such as Croatia, Greece, Hong Kong, Korea, Poland, Russia, Taiwan, the Philippines, Vietnam and others. Australia and the Asia–Pacific is only available as a major to international students. International students may access one of the other majors offered provided that the country they choose as their major is able to grant them a visa to study there. This needs to be determined prior to commencing subjects within the International Studies major. If a visa cannot be granted, then it will not be possible to undertake the chosen major.

978xxx

In-country Study 2

24cp; prerequisite(s): 977xxx In-country Study 1

For subject description, see 977xxx In-country Study 1.

ALPHABETICAL LISTS OF SUBJECTS

SUBJECTS OFFERED BY SCIENCE

Advanced Algebra	35419
Advanced Calculus	35232
Advanced Clastic Basin Analysis	66653
Advanced Financial Modelling	35485
Advanced Mathematical Methods	35436
Advanced Mathematical Programming	35443
Advanced Stochastic Processes	35466
An Introduction to Phase Diagrams and Thermobarometry	66952
Analysis 1	35321
Analysis 2	35322
Analysis of Natural Materials	66962
Analytic Number Theory	35418
Analytical Biochemistry	91326
Analytical Chemistry 1	65306
Analytical Chemistry 2	65409
Analytical Chemistry 3	65606
Anatomical Pathology	91354
Animal Ecophysiology	91363
Applied Mathematical Programming	35542
Applied Mathematics 3A	35333
Applied Mathematics 3B	35334
Applied Organic Chemistry	65521
Applied Palaeontology	66941
Applied Research Skills	60991
Applied Simulation Modelling	35563
Aquatic Ecology	91121
Atoms, Photons and Orbits (Physics 3)	68311
Australian Biota	91309
Australian Plants and Biotechnology	91234
Behavioural Sciences	91704
Biobusiness and Environmental Biotechnology	91369
Biochemistry 1	91313
Biochemistry 2	91320
Biochemistry, Genes and Disease	91345
Biocomputing	91395
Biological Evidence	91141
Biological Hazards and Toxicology	69338
Bioreactors and Bioprocessing	91368
Biotechnology	91142
Case Studies in Management Science	35549
Cells, Genetics and Evolution	91101
Chemical Safety and Legislation	65410
Chemical Safety (Management)	69332
Chemistry 1A	65012
Chemistry 1C	65101
Chemistry 2A	65022
Chemistry 2C	65201
Chemistry and Pharmacology of Illicit Drugs	65741
Chinese Diagnostic System 1	99618
Chinese Diagnostic System 2	99621
Chinese Herbal Formulae	99623
Chinese Herbal Practice 1	99594
Chinese Herbal Practice 2	99596
Chinese Massage (*Tuina*)	99579
Chinese Medical Classics	99629
Classics of Chinese Herbal Medicine	99614
Clinic – Level 2 and Point Location 2	99619
Clinic Theory and Clinic Level 1	99642
Clinic Theory and Clinic Level 2	99643
Clinic Theory and Clinic Level 3	99644
Clinic Theory and Clinic Level 4	99645
Clinic Theory and Clinic Level 5	99646
Clinic Theory and Clinic Level 6	99647
Clinical Bacteriology	91338
Clinical Features of Disease	99584
Clinical Practice 1	99630
Clinical Practice 2	99631
Clinical Practicum	99627
Clinical Theory and Clinic	99616
Clinical Theory and Clinic Level 3	99624
Coal and Organic Petrology	66944
Coastal and Marine Ecosystems	91124
Coastal Environmental Assessments	66943
Complex Forensic Cases (Biology)	91139
Complex Forensic Cases (Chemistry)	65743
Composites	67608
Computational Mathematics and Physics	33490
Computing and Mathematics for Science	33290
Contaminated Site Management	66025
Convergent Margin Tectonics	66651
Convexity and Optimisation	35428
Coral Reef Dynamics	66963
Coral Reef Ecosystems	91126
Corrosion and Degradation of Materials	67606
Crime Scene Investigation	65543
Crustal and Mantle Processes	66508
Current Topics in Science and Technology	91499
Cytopathology Part A	91130
Cytopathology Part B	91131
Data Analysis in Occupational Health and Safety	69325
Deformation Processes	66956

Design and Analysis of Experiments	35356
Desktop Geological Mapping	66958
Differential Equations	35231
Discrete Mathematics	35111
Discrete Optimisation	35447
Disease States	99628
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Dynamic Optimisation	35448
Earth Materials	66304
Earth Resources	66408
Earth Science 1	66101
Ecological Principles and Modelling	91112
Ecosystem Vulnerability and Valuation	66037
Electromagnetics and Optics	68611
Electron Microscopy and Microanalysis	60502
Electronics	68314
Electronics and Interfacing	68514
Electrotechnology and Data Analysis	68312
Energy Science and Technology	68412
Engineering and Groundwater Geology	66611
Environmental and Quaternary Geology	66609
Environmental Chemistry	65621
Environmental Management	91122
Epidemiology and Public Health Microbiology	91330
Essentials of Pathophysiology	99636
Evaluating Occupational Health and Safety (Construction Industry)	69336
Experimental Design and Sampling	91110
Extractive Metallurgy / Metallurgical Chemistry	65062
Field Studies 1	66204
Financial Modelling	35384
Fire and Explosion Investigation	65742
First Aid Certificate Course	99536
Fisheries Resources	91118
Fold Belts and Cratons	66305
Forensic Imaging	65341
Forensic Research Project	65856
Forensic Statistics	3xxxx
Forensic Toxicology 1	65542
Forensic Toxicology 2	65642
Forest and Mountain Ecology	91371
Foundation Mathematics	35010
Foundations of Physics	68101
Foundations of Pilates Method 1	91801
Foundations of Pilates Method 2	91802
Foundations of TCM	99502
Freshwater Ecology	91117
Functional Analysis	35427
Functional Biology	91102
Further Methods in Operations Research	35545
General Microbiology	91314
Geochemical Analysis Techniques and Applications	66950
Geological and Structural Interpretation of Potential Field Data	66955
Geological Mapping	66612
Geophysical Data Processing and Plotting using GMT	66959
Geophysics	66510
Graduate Clinic Internship (CHM)	99597
Graduate Clinic Level 1 (CHM)	99632
Graduate Clinic Level 2 (CHM)	99615
Graduate Science Projects (GD) (PT)	66024
Graduate Science Projects (M) (PT)	66023
Groundwater Geophysics	66018
Groundwater Science Projects (GD) Part A (PT)	66048
Groundwater Science Projects (GD) Part B (PT)	66049
Groundwater Science Projects (GD) (FT)	66022
Groundwater Science Projects (M) Part A (PT)	66046
Groundwater Science Projects (M) Part B (PT)	66047
Groundwater Science Projects (M) (FT)	66021
Haematology 1	91355
Haematology 2	91358
Health Sciences 1	99563
Health Sciences 2	99570
Health Statistics	35254
High Performance Computing	35383
History and Philosophy of TCM	99620
History of Mathematics	35205
Honours (Biological and Biomedical Sciences) Part 1 (PT)	91133
Honours (Biological and Biomedical Sciences) Part 2 (PT)	91134
Honours (Biological and Biomedical Sciences) Part 3 (PT)	91135
Honours (Biological and Biomedical Sciences) Part 4 (PT)	91136
Honours (Chemistry) 1	65861
Honours (Chemistry) 2	65862
Honours (Environmental Science) 1	91105
Honours (Environmental Science) 2	91106
Honours (Geoscience) 1	66856
Honours (Geoscience) 2	66857
Honours (Materials Science) 1	67861
Honours (Materials Science) 2	67862
Honours (Medical and Molecular Biosciences) Part 1 (FT)	91103
Honours (Medical and Molecular Biosciences) Part 2 (FT)	91104
Honours (Physics)	68854
Honours Project (TCM) 1	99661
Honours Project (TCM) 2	99662
Honours Seminar A	35491
Honours Seminar B	35492
Human Factors/Ergonomic Design	69323
Hydrogeochemistry	66015
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Identifying Groundwater Dependent Ecosystems	66036
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Immunology 1	91351
Immunology 2	91359
Individual Project – Life Sciences	91399
Industrial Ceramics	67306
Industrial Metallurgy	67408
Inorganic Chemistry 1 (Transition Metal Chemistry)	65411
Inorganic Chemistry 2 (New Inorganic Materials)	65509
Interpretation of 2D and 3D Seismic Reflection Data	66953
Interpretation of (Multivariate) Geological Data	66961
Interpretation of Seismic Refraction Data	66964
Introduction to Chinese Herbal Medicine	99567
Introduction to Computational Science	68xxx
Introduction to Computing	35170
Introduction to Geostatistical Data Analysis	66957
Introduction to Materials	67101
Introduction to Research Project A	66040
Introduction to Research Project B	66041
Introduction to TCM	99560
Introductory Mathematical Methods	33401
Investigation of Human Remains	91138
Landscape Design and Plant Culture	91247
Legal Aspects of Occupational Health and Safety	69342
Linear Algebra	35212
Linear Models and Experimental Design	35459
Loglinear Modelling	35458
Management of Coasts, Oceans and Catchments	98711
Management of Plants in Landscapes	91250
Managing Science and Scientists	60992
Mapping and Remote Sensing	91120
Mathematical Methods	35335
Mathematical Modelling 1	33130
Mathematical Modelling 1 – Part A1	33133
Mathematical Modelling 1 – Part B1	33134
Mathematical Modelling 1 (two-semester)	33132
Mathematical Modelling 2	33230
Mathematical Modelling for Science	33190
Mathematical Practice	35100
Mathematics 1	35101
Mathematics 1 (Life Sciences)	33101
Mathematics 2	35102
Mathematics and Scientific Software	33390
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Mathematics in Sport	35106
Mechanical Properties of Materials	67303
Medical and Diagnostic Biochemistry	91344
Medical Devices and Diagnostics	91705
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Medical Science 1	91701
Medical Science 2	91702
Microsystems and Advanced Treatment Techniques	99626
Molecular Biology 1	91332
Molecular Biology 1A	91132
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MSc Thesis (FT)	60777
MSc Thesis (FT)	60778
MSc Thesis (FT)	91775
MSc Thesis (Mathematics) (FT)	34777
MSc Thesis (Mathematics) (PT)	34778
MSc Thesis (PT)	91776
Multivariate Statistics	35457
Nanomaterials	60xxx
Nanosciences 1	60103
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Nonlinear Dynamical Systems	35438
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Numerical Analysis 2	35382
Numerical Methods	35281
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Occupational Hazard Analysis	69312
Occupational Health and Safety in Society	69311
Occupational Health and Safety Management	69345
Occupational Health and Safety Project	69351
Operations Research Modelling	35140
Operations Research Practice	35340
Optimal Control 1	35486
Optimal Control 2	35487
Optimisation 1	35241
Optimisation 2	35342
Organic Chemistry 1	65202
Organic Chemistry 2 (Structure Elucidation and Synthesis)	65508
Palaeobiology Part I	66942
Palaeobiology Part II	66949
Parasitology	91352
Partial Differential Equations	35437
People and the Physical Environment	69335
Pharmacology 1	91707
Pharmacology 2	91709
Pharmacology of Traditional Chinese Medicine	99622
PhD Thesis (FT)	60767
PhD Thesis (FT)	60988
PhD Thesis (Mathematics) (FT)	34988
PhD Thesis (Mathematics) (PT)	34987
PhD Thesis (PT)	607681
PhD Thesis (PT)	60987
Physical Aspects of Nature	68041
Physical Chemistry 1	65307
Physical Chemistry 2	65607
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Physical Metallurgy	67304
Physical Properties of Materials	67407
Physics in Action (Physics 2)	68201

Physiological Bases of Human Movement	91429
Physiological Systems	91703
Pilates Method (Rehabilitation) 1	91xxx
Pilates Method (Rehabilitation) 2	91xxx
Plant Biotechnology	91128
Plant Pathology	91237
Plant Physiology	91270
Plant Population Genetics and Biodiversity	91249
Plant Production and Growing Systems	91233
Plant Production Systems	91248
Plant Structure, Function and Culture	91246
Point Location 1	99617
Policy and Management for Groundwater Dependent Ecosystems	66038
Pollution Assessment	91111
Pollution Ecology	91113
Polymer Science	67305
Polymer Technology	67409
Practice Management	99591
Principles of Chinese Herbal Medicine	99599
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Principles of Forensic Science	65241
Principles of Pharmacology in Chinese Medicine	99613
Probability and Stochastic Processes	35361
Processing of Seismic Reflection and Ground Penetrating Radar Data	66954
Professional Practice (Environmental)	66039
Professional Practice (Pilates Rehabilitation) 1	91xxx
Professional Practice (Pilates Rehabilitation) 2	91xxx
Professional Scientific Practice A	60811
Professional Scientific Practice B	60812
Professional Training (Pilates Method) 1	91898
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Project A	35292
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Psychophysiology	91708
Pure Mathematics 3A	35313
Pure Mathematics 3B	35314
Quality Control	35355
Quantum and Solid-state Physics	68511
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Regression Analysis	35353
Report (MSc) Part A	35597
Report (MSc) Part B	35598
Research Methodology	60990
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Research Methods in Applied Physics	68512
Research Project (Major) A	66042
Research Project (Major) B	66043
Research Project Proposal	60993
Research Proposal (Occupational Health and Safety)	69353
Risk Assessment and Management	98708
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Scanned Probe and Electron Microscopy	60xxx
Scheduling Theory	35446
Semi-arid Ecology	91370
Seminar (Computing)	35394
Seminar (Mathematics)	35391
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Seminar (Statistics)	35393
Simulation Modelling	35363
Special Reading Assignment – Life Sciences	91398
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Special Topics in TCM (Intermodal and Professional)	99590
Statistical Consulting	35469
Statistical Consulting – Part A	35470
Statistical Consulting – Part B	35471
Statistical Design and Analysis	33116
Statistical Design and Analysis – Part A	33112
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Statistics 1	35151
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Surface Chemistry of Materials	67508
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Surficial Processes and Products	66409
TCM Disease States 1	996xx
TCM Disease States 2	996xx
Technical Ceramics	67506
Technology, Society and Change	95556
Tectonics and Surface Dynamics	66509
Terrestrial Ecosystems	91119
The Physiology of *Qi*	99564
Thesis (Honours)	35498
Thesis (Honours) – Part A	35493
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Thesis Seminar A	35496
Thesis Seminar B	35497
Time Series Analysis	35467
Toxicity Assessment	91114
Transfusion Science	91129
Undergraduate Research Project	91127
Vibrations, Quanta and Nucleons (Physics 4)	68411
Wildlife Ecology	91116
X-ray Analytical Methods	60501

SUBJECTS OFFERED BY OTHERS

Academic English for Postgraduate Study	59311
Accounting for Business	22107
Accounting for Small Business 1	22566
Administrative Law	70617
Advanced Digital Systems	48451
Australian English Language and Culture 1	59314
Australian English Language and Culture 2	59315
Australian Society and Culture 1	59308
Australian Society and Culture 2	59309
Business Information Analysis	26133
Business Law and Ethics	79203
Business Process Management	21131
Capital Budgeting and Valuation (Advanced)	25905
Capstone Project in Business Planning	21126
Career and Portfolio Development	21856
Chinese Language and Culture	97x111
Communication and Audience	50125
Communication and Information Environments	50226
Communication for Employment	59319
Community Research Elective (PG)	50295
Community Research Elective (PG)	50296
Community Research Elective (UG)	50293
Community Research Elective (UG)	50294
Comparative Social Change	50140
Complex Forensic Cases (Law)	79024
Computational Mathematics and Physics	33490
Computing for Groundwater Specialists	49550
Contemporary China	976111
Contemporary Europe	976401
Contemporary Japan	976211
Contemporary Latin America	976501
Contemporary South-East Asia	976301
Corporate Financial Analysis	25410
Corporate Law	70417
Criminal Law	70217
Data Acquisition and Distribution	48570
Data Structures and Procedural Programming	31473
Database Fundamentals	31474
Derivative Securities	25620
Derivative Security Pricing	25923
Distributed Computing Architecture	31470
Economics for Business	25115
Electronic Business	24307
Employment Relations	21720
Employment Relations in the Global Context	21306
Engineering Communication	48230
Engineering Economics and Finance	48250
Engineering for Sustainability	48210
Engineering Management	48260
English for Academic Purposes 1	59304
English for Academic Purposes 2	59305
English for Business	59320
Environmental Law and Science	79004
Equity and Trusts	70516
Federal Constitutional Law	70616
Financial Time Series	25606
French Language and Culture	97x411
Fundamentals of Business Finance	25300
German Language and Culture	97x421
Global Business Competitive Intelligence	21784
Greek	97x710
Groundwater Computing	49554
Groundwater Modelling	49555
Human Resource Management	21724
Human Resource Management Practices	21835
In-country Study 1	977xxx
In-country Study 2	978xxx
Indonesian Language and Culture	97x311
Informatics VB	48221
Information, Classification and Control	31468
Information Systems Principles	31060
Information Technology Professional and Society	31479
Innovation and Entrepreneurship	21854
Innovation and Small Venture Management	21227
International Communication	50127
International Management	21717
Introduction to Civil Engineering	48310
Introduction to Collaborative Systems	31472
Introduction to Corporate Strategy	21193
Introduction to Electrical Engineering	48510
Introduction to Environmental Engineering	48820
Introduction to Mechanical and Mechatronic Engineering	48610
Introduction to Telecommunications Engineering	48720
Introduction to Tourism Systems	27184
Introduction to Tourist Behaviour	27185
IT Experience 1	31137
IT Experience 2	31139
Italian Language and Culture	97x431
Japanese Language and Culture	97x211
Law for Leisure, Sport and Tourism	27628
Law of Contract	70211
Law of Evidence	71216
Law of Tort	70311
Legal Process and History	70113
Legal Research	70105
Leisure and Fitness Centre Operations	27316
Leisure and Tourism Planning	27523
Leisure in Australia	27126
Leisure Services Management	27216
Malaysian Language and Culture	97x331
Management Research Methods	21751
Management Skills	21440
Managing for Sustainability	21832
Managing People	21813
Managing People and Organisations	21129

SUBJECT CODE CHANGES

In December 2002, a number of subject codes were merged across UTS. This was undertaken to consolidate the university's records. These subjects are listed in the table below (in numeric order), with the corresponding new code and name (where applicable). The new details will now appear on results notification and transcripts.

Old	New	Subject name
34987	34988	PhD Thesis (Mathematics) (FT)
48111	48271	Aerospace Operations 1
48401	48271	Aerospace Operations 1
48402	48272	Aerospace Operations 2
48403	48273	Aerospace Operations 3
48404	48274	Aerospace Maintenance Management
52203	50129	News and Current Affairs
54351	50359	Screenwriting
54364	50178	Soundtrack
73401	75401	Litigation
73402	75402	Property Transactions (Law)
73403	75403	Commercial and Estate Practice
73411	75411	Practical Experience
73412	75412	Legal Skills and Professional Awareness
73415	75415	Professional Conduct
73416	75416	Professional Conduct 2
76080	76065	Finance Law
77780	77740	Research Paper
77781	77725	Research Project
77787	77788	Doctoral Dissertation (SJD) (FT)
77791	77790	Thesis (Law) (FT)
77800	77725	Research Project
77801	77716	International Trade Law (PG)
77802	77701	International Economic Law (PG)
77804	77703	International Business Transactions
77805	77729	Chinese Trade and Investment Law
77806	77733	Chinese Law and Legal Systems
77809	77927	International Monetary Law
77811	77712	Deceptive Trade Practices
77812	77721	Restrictive Trade Practices (PG)
77813	77730	Corporate Insolvency and Restructuring
77814	77751	International Commercial Arbitration
77818	77744	Franchising Law
77821	77715	Banking Law (PG)
77822	77724	International Banking and Finance Law
77823	77754	Advanced Corporate Insolvency and Restructuring
77824	77704	European Union Law
77828	77926	Private International Law
77829	77931	Advanced European Union Law
77833	77737	Carriage of Goods By Sea
77834	77706	Advanced Administrative Law (PG)
77835	77709	Planning and Development Law 1
77836	77934	Pollution Law
77838	77719	Capital Gains Tax: Fundamentals
77839	77924	Superannuation Law
77841	77707	Advanced Constitutional Law (PG)
77851	77734	Law and Medicine
77855	77785	Law of Futures and Derivatives
77858	77789	Law of Prescribed Interests
77859	77793	Information Technology Law
77860	77794	International Environmental Law
77866	77796	Taxation of Partnerships and Trusts
77870	70113	Legal Process and History
77871	70105	Legal Research
77872	70211	Law of Contract
77873	70217	Criminal Law
77874	70311	Law of Tort
77875	70317	Real Property
77876	70318	Personal Property
77877	70417	Corporate Law
77878	70516	Equity and Trusts
77879	70616	Federal Constitutional Law
77880	70617	Administrative Law
77881	71005	Practice and Procedure
77882	71116	Remedies
77883	71216	Law of Evidence
77905	77886	Telecommunications and Media Law
77907	77903	Copyright Law 1
77908	77904	Copyright Law 2
77909	77820	Corporations, Finance and Securities (LS)
77949	77935	International Business Law
77958	77896	Legal Process and Intellectual Property
77960	77889	Trade Marks Law
77961	77890	Trade Marks Practice
77962	77898	Patent Law (LP)
77963	77891	Patent Systems
77964	77893	Designs Law And Practice
77965	77894	Drafting Of Patent Specifications
77966	77895	Interpretation and Validity of Patent Specifications
77987	77989	PhD (Law) (PT)
83320	83332	Print Technology
83520	83552	Digital Fashion and Textiles Elective
83530	83553	Research Project F&T
83620	83662	Design and Industry
83630	83663	Professional Practice F&T
92865	92813	Dissertation
779871	77989	PhD (Law) (PT)
K80206	16351	Introduction to Valuation
K80207	16854	Real Estate Law
K80227	24730	Advanced Marketing Management
K80504	21720	Employment Relations

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(Composition, terms of reference and membership details are available from the Faculty Administrator)

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  fax (02) 9209 4351

Kuring-gai campus

- KG01–KG05
  Eton Rd, Lindfield
  (PO Box 222, Lindfield NSW 2070)
- UTS Northshore Conference Centre

St Leonards campus

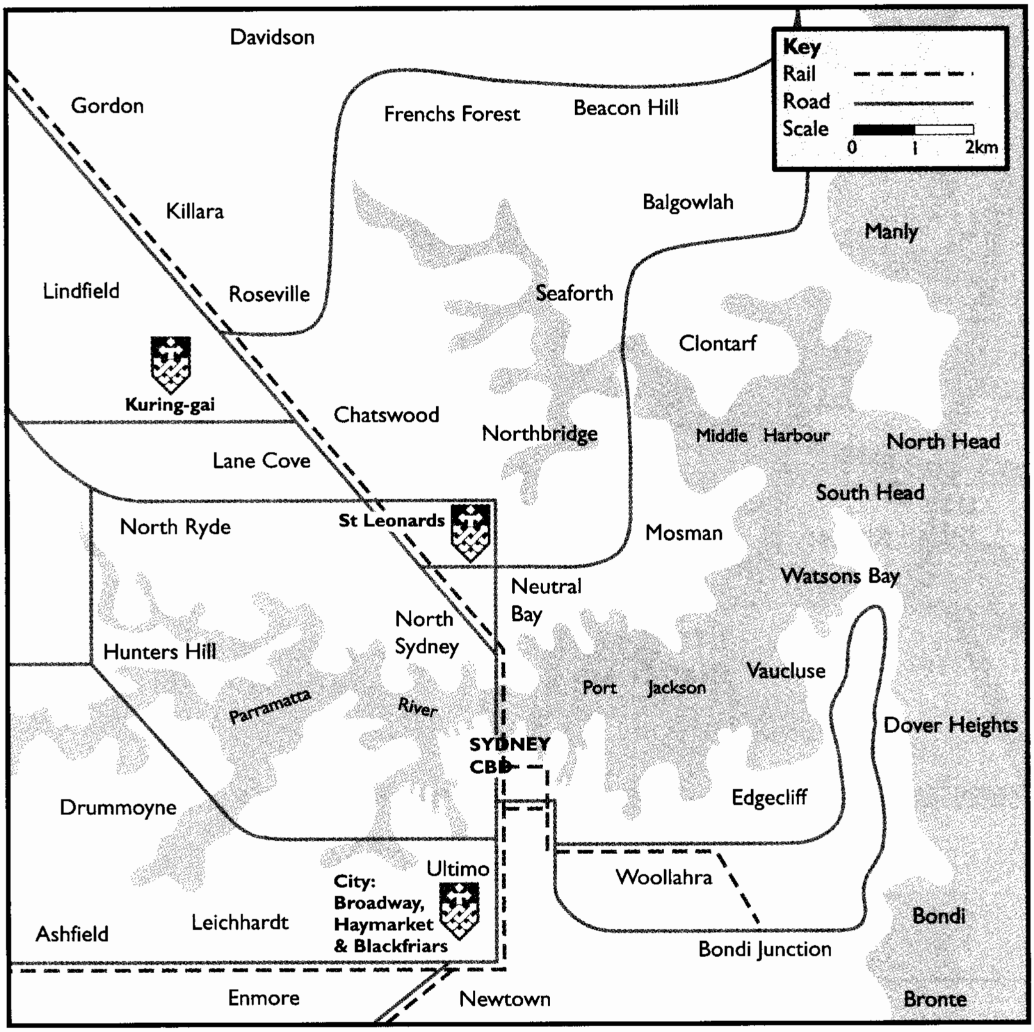
- SL01, Dunbar Building
  Corner Pacific Highway and
  Westbourne Street, Gore Hill
- SH52, Clinical Studies Building
  SH51, Centenary Lecture Theatre
  SH11A, West Wing, Reserve Road
  Royal North Shore Hospital
- SH44, Gore Hill Research Centre
  and SH44A, Biology Annexe
  Royal North Shore Hospital

Yarrawood conference and research centre

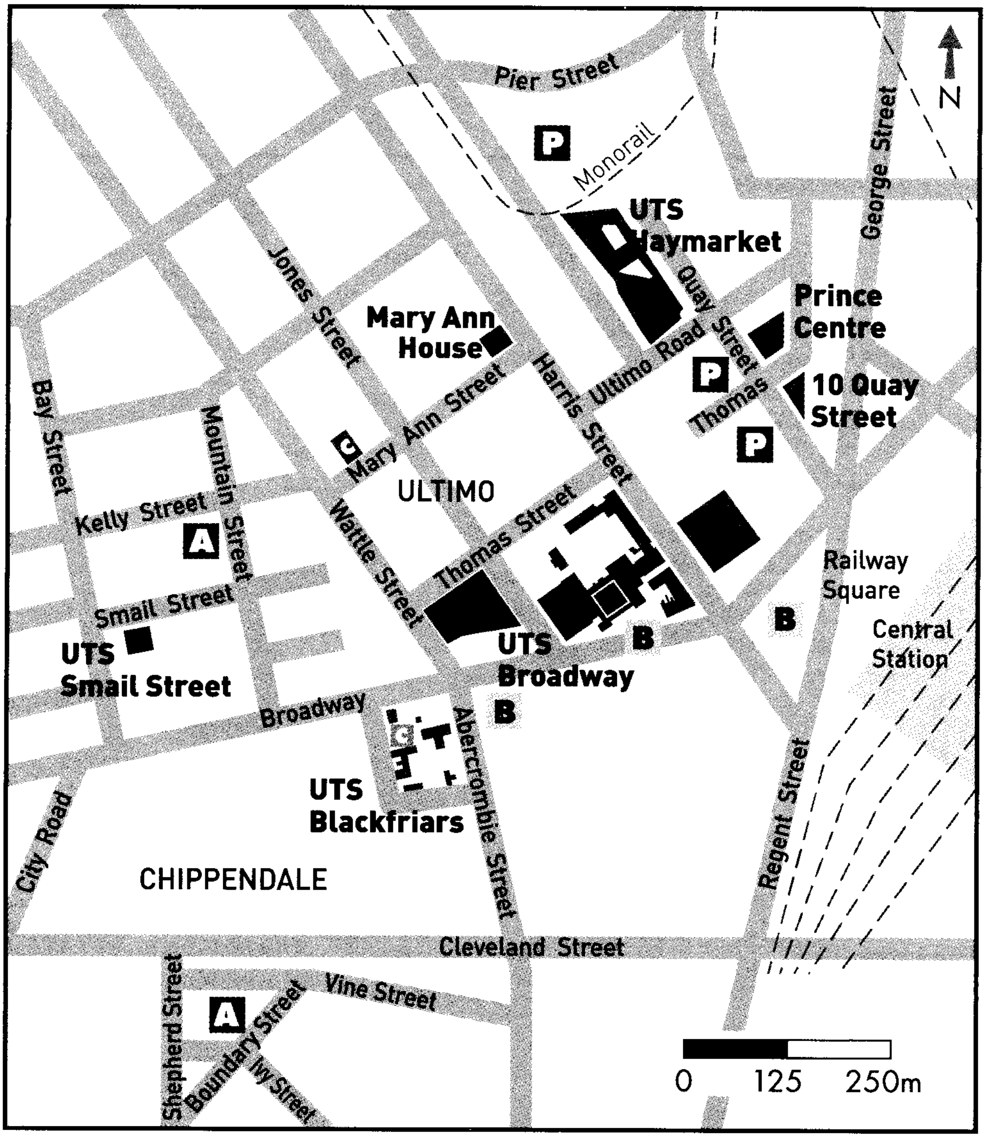
- YW01–15
  689 Springwood Road
  Yarramundi NSW 2753

UTS MAPS

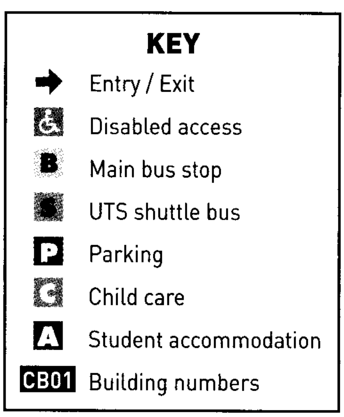
Sydney regional map



City campus

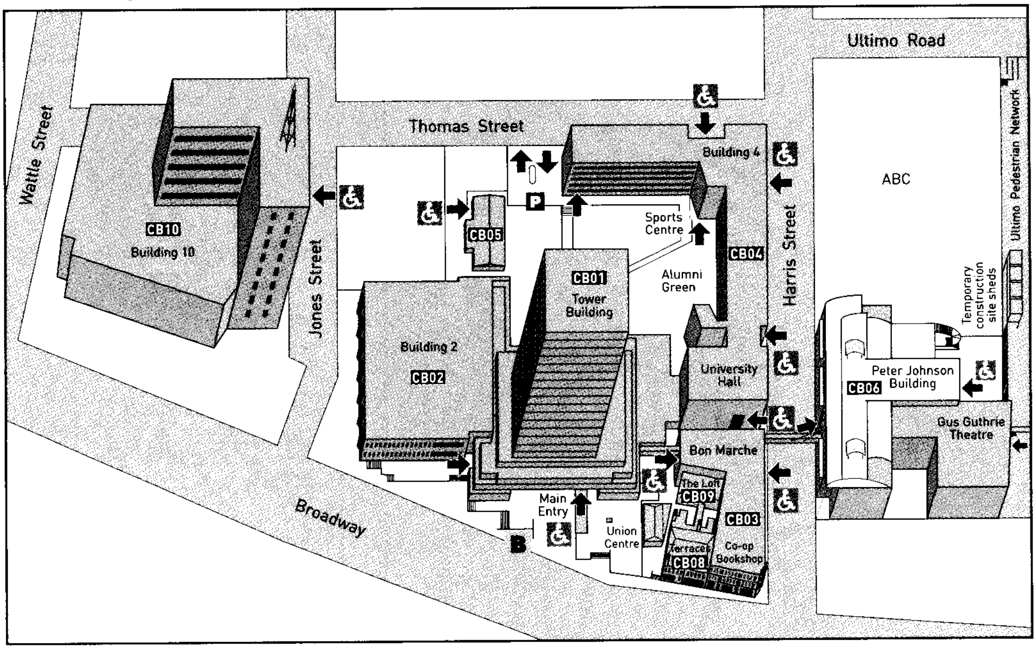


Pier Street
Monorail
UTS Haymarket
George Street
N
Prince Centre
10 Quay Street
Quay Street
Ultimo Road
Thomas
Mary Ann House
Jones Street
Harris Street
Mary Ann Street
ULTIMO
Bay Street
Mountain Street
Kelly Street
Smail Street
UTS Smail Street
Wattle Street
Thomas Street
UTS Broadway
Railway Square
Central Station
Broadway
Abercrombie Street
UTS Blackfriars
Regent Street
City Road
CHIPPENDALE
Cleveland Street
Shepherd Street
Vine Street
Boundary Street
Ivy Street
0
125
250m

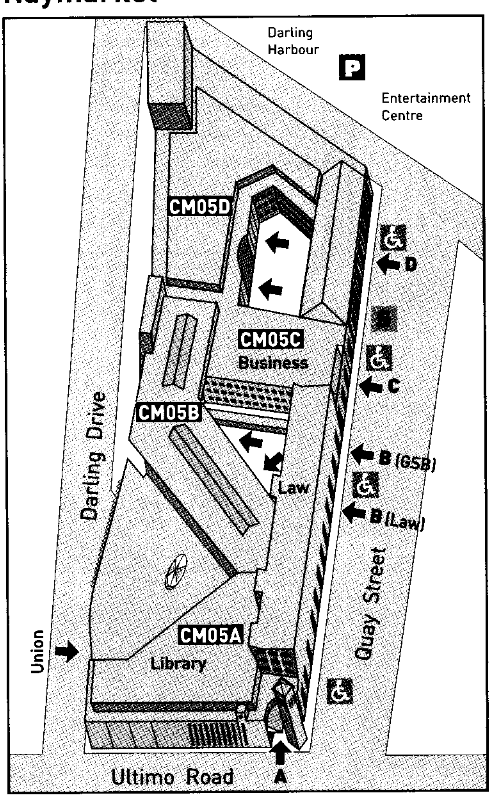


KEY
Entry / Exit
Disabled access
Main bus stop
UTS shuttle bus
Parking
Child care
Student accommodation
CB01 Building numbers

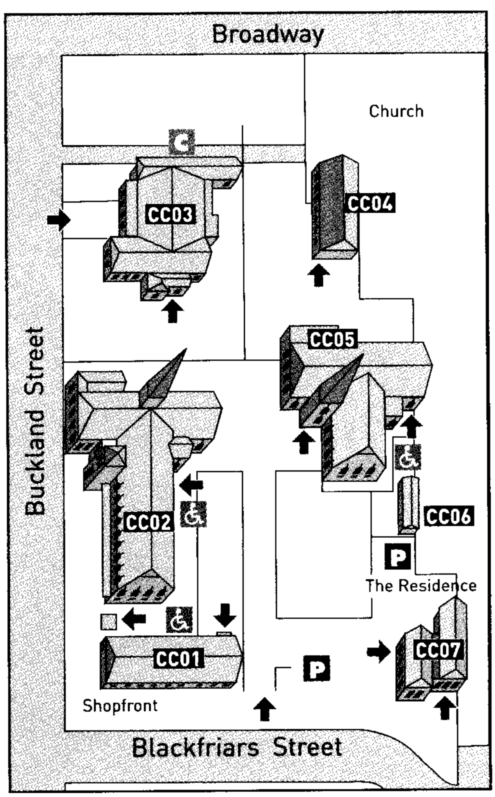
Broadway



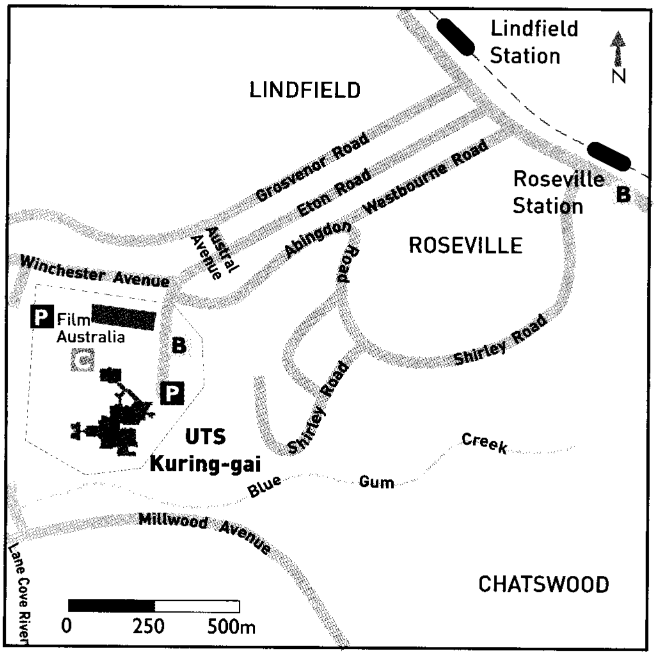
Haymarket



Blackfriars

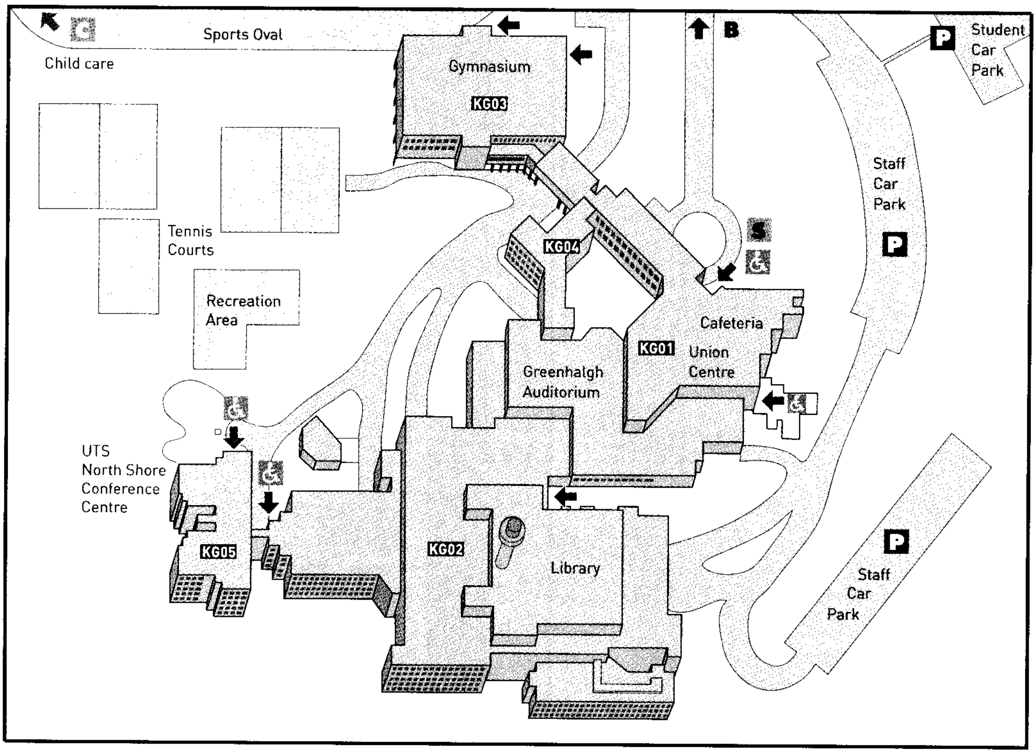


Kuring-gai campus

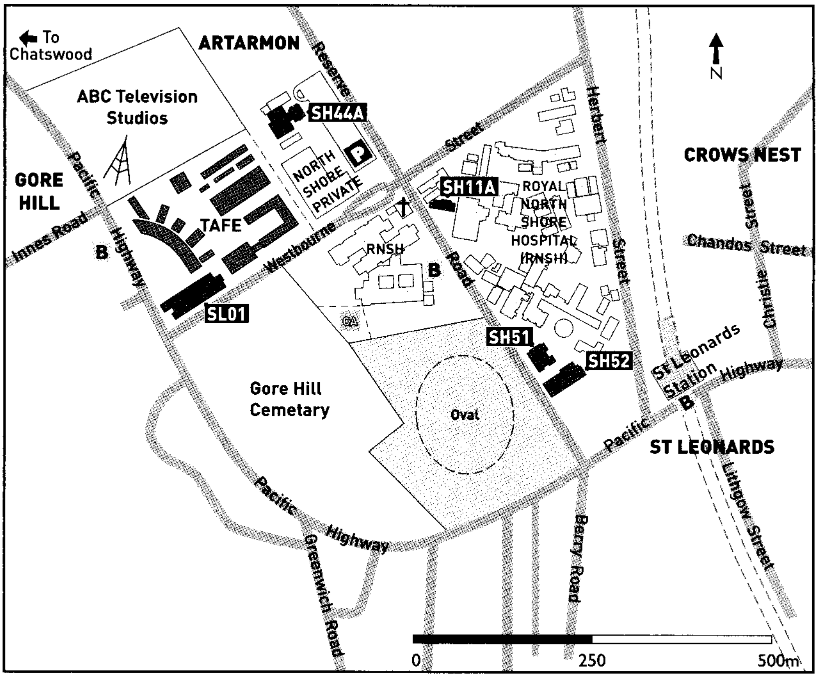


KEY

- Entry / Exit
- Disabled access
- B Main bus stop
- S UTS shuttle bus
- P Parking
- Child care
- A Student accommodation
- CB01 Building numbers



St Leonards campus



KEY TO MAP

Building colours indicate:

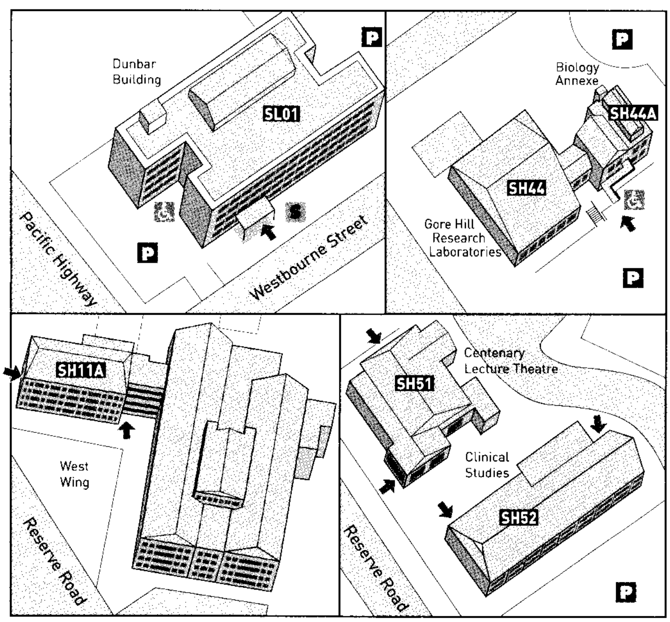
UTS buildings — Hospital buildings — TAFE buildings

UTS building numbers indicate:

SH44A Biology Annexe
SH52 Clinical Studies
SL01 Dunbar
SH51 Centenary Lecture Theatre
SH11A West Wing

Other symbols indicate:

B Bus Stop — † Chapel — CA Construction area — P Parking



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