

UNIVERSITY OF TECHNOLOGY, SYDNEY

# Faculty of Mathematical and Computing Sciences HANDBOOK

ENQUIRIES DESK



U|T|S|

2000

378.94405/  
25

# Faculty of Mathematical and Computing Sciences HANDBOOK

# 2000

---

## IMPORTANT YEAR 2000 NOTICE

The University of Technology, Sydney is taking all reasonable steps to identify and remedy any Year 2000 problems which might interfere with the courses and subjects it is proposing to offer during the Year 2000. Students and prospective students are advised that the University may still find it necessary in responding to any Year 2000 problem, to change the details of any course, subject, or class described in this or any other University publication. This could include not offering subjects in a particular teaching period, altering the mode of delivery for teaching, and changing assessment requirements. The University will endeavour:

- to confine such changes to the minimum necessary to address the Year 2000 problem
- to provide advance notice to students to the full extent possible, and
- where possible, to make other reasonable arrangements to minimise any disadvantage to students.

Students and prospective students should make appropriate inquiries to determine whether a course or subject has been affected by a Year 2000 problem by contacting the relevant Faculty Office.

---

## DISCLAIMER

This publication contains information which was current at 20 August 1999. 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. Readers are responsible for verifying information which pertains to them by contacting the Faculty or the UTS Information Service.

University of Technology,  
Sydney. Faculty of  
Mathematical and Computing  
Sciences  
Handbook  
Received on: 03-11-99  
CITY CAMPUS

## **EQUAL OPPORTUNITY**

---

It is the policy of the University of Technology, Sydney to provide equal opportunity for all persons regardless of sex, race, marital status, family responsibilities, disability, sexual preference, age, political conviction or religious belief.

## **FREE SPEECH**

---

The University 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.

## **ACCESS UTS ON THE WEB**

---

<http://www.uts.edu.au>

*Faculty Handbooks and Calendar*

<http://www.uts.edu.au/div/publications/>

*UTS Rules and Policies*

<http://www.uts.edu.au/div/publications/policies/>

## **EDITORIAL AND PRODUCTION**

---

Publications Branch,  
Secretariat and Corporate Affairs Unit,  
Registrar's Division

## **COVER**

---

Design by  
UTS External Relations Unit

## **COPYRIGHT STATEMENT**

---

© All rights reserved. No part of this publication may be reproduced in any form by any process, electronic or otherwise, without the prior written permission of the University of Technology, Sydney, except as permitted by the Copyright Act 1968.

# TABLE OF CONTENTS

---

<b>GENERAL INFORMATION</b>	<b>5</b>
Welcome	5
About the UTS Handbooks	5
Student inquiries	6
Applications	6
Fees and costs	6
HECS	7
Financial Help	8
UTS Library	8
Research Office	8
University Graduate School	9
Support for student learning	9
Equity and diversity	10
Other services	10
Principal dates for 2000	12
<b>FACULTY INFORMATION</b>	<b>15</b>
Message from the Dean	15
Faculty Mission Statement	16
Information for Mathematical and Computing Sciences students	17
Faculty Office contacts	18
List of courses and codes	25
<b>SCHOOL OF MATHEMATICAL SCIENCES</b>	<b>26</b>
Prizes	29
School contacts	30
Undergraduate courses	31
Bachelor of Science in Mathematics	31
Bachelor of Science (Honours) in Mathematics	35
Bachelor of Science in Mathematics/Bachelor of Arts in International Studies	36
Bachelor of Mathematics and Finance	39
Bachelor of Mathematics and Finance (Honours)	40
Bachelor of Mathematics and Finance/Bachelor of Arts in International Studies	41
Bachelor of Mathematics and Computing	44
Postgraduate courses	46
<i>Postgraduate Research Degrees</i>	46
Doctor of Philosophy	47
Master of Science	47
<i>Postgraduate coursework programs</i>	48
Master of Science in Operations Research	48
Graduate Diploma in Applicable Mathematics	49
Graduate Diploma in Mathematics and Finance	50
Graduate Diploma in Operations Research	50
Graduate Diploma in Statistics	51
Graduate Certificate in Mathematical Sciences	52
Numerical list of subjects	54
Alphabetical list of subjects	57

<b>SCHOOL OF COMPUTING SCIENCES</b>	<b>59</b>
Academic advisers for 2000	60
Prizes and scholarships	62
School contacts	64
Undergraduate courses	65
Bachelor of Science in Computing Science	65
Bachelor of Information Technology	74
Bachelor of Science in Computing Science/Bachelor of Arts in International Studies	77
Bachelor of Science in Computing Science/Bachelor of Laws	80
Double degree in Business and Computing Science	81
Bachelor of Science (Honours) in Computing Science	81
Bachelor of Computing	83
Bachelor of Computing/Bachelor of Arts in International Studies	84
Postgraduate courses	85
<i>Postgraduate research degrees</i>	85
Doctor of Philosophy	86
Master of Science	87
<i>Postgraduate coursework programs</i>	88
Master of Science in Computing	88
Master of Business in Information Technology Management	93
Graduate Diploma in Information Technology Management	93
Graduate Certificate in Information Technology Management	93
Master of Interactive Multimedia	96
Graduate Diploma in Interactive Multimedia	96
Graduate Certificate in Interactive Multimedia	96
Master of Science in Internetworking	98
Graduate Diploma in Internetworking	98
Graduate Certificate in Internetworking	98
Graduate Diploma in Information Technology	99
Graduate Certificate in Information Technology	100
Numerical list of subjects	102
Alphabetical list of subjects	109
<b>SUBJECT DESCRIPTIONS</b>	<b>112</b>
School of Mathematical Sciences	112
School of Computing Sciences	121
Subjects offered by other faculties	139
International Studies subjects	148
<b>BOARDS AND COMMITTEES</b>	<b>160</b>
Faculty Board in Mathematical and Computing Sciences	160
Faculty Graduate Studies Committee	160
Mathematical Sciences Advisory Committee	161
Computing Sciences Advisory Committee	161
Course Advisory Committee	162
<b>STAFF LIST</b>	<b>163</b>
<b>INDEX</b>	<b>166</b>
<b>UTS CONTACTS</b>	<b>171</b>
<b>MAPS</b>	<b>172</b>

# 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 enter the workforce within four 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 a range of undergraduate and postgraduate degrees, which are developed by the Faculties of Business; Design, Architecture and Building; Education; Engineering; Humanities and Social Sciences; Law; Mathematical and Computing Sciences; Nursing, Midwifery and Health; and Science. Each of these faculties is responsible for a range of 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 UTS 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.

The information contained in the UTS Handbooks and Calendar is correct at the time of printing. However, UTS is continuously updating and reviewing courses and services to ensure that they meet the needs of students and industry, and as a result information contained in these publications may be subject to change.

For the latest information check with the information service, or on the website at:

<http://www.uts.edu.au/div/publications/>

## STUDENT INQUIRIES

### *City campus*

#### **UTS Information Service**

Foyer, Tower Building  
1 Broadway

#### **Postal address**

PO Box 123  
Broadway NSW 2007  
telephone: (02) 9514 1222  
fax: (02) 9514 1200

#### **Email inquiries**

within Australia – [info.office@uts.edu.au](mailto:info.office@uts.edu.au)

### *Kuring-gai campus*

#### **Kuring-gai Student Centre**

Level 6, Main Building  
Eton Road  
Lindfield

#### **Postal Address**

PO Box 222  
Lindfield NSW 2070  
telephone: (02) 9514 1222  
fax: (02) 9514 5032

### *International Programs*

10 Quay Street, Sydney

#### **Postal Address**

PO Box 123  
Broadway NSW 2007  
telephone: (02) 9514 1531  
fax: (02) 9514 1530

#### **Email inquiries**

International – [intlprograms@uts.edu.au](mailto:intlprograms@uts.edu.au)

#### **World wide web address**

<http://www.uts.edu.au>

## APPLICATIONS

### **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 October. To find out more about these courses and the application procedures, check the *UAC Guide*, or the UAC website at: [www.uac.edu.au](http://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.

### **Postgraduate**

Applications for postgraduate courses should be made directly to UTS. For courses starting at the beginning of the year, most applications are open from August to October, but some may have earlier closing dates. For courses starting in the middle of the year, applications close in May.

For more information about applying to study at UTS, contact the UTS Information Service.

### **International students**

International students' 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 31 December 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 the International Programs Office.

### **Non-award and external award 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 external award study. There are four application periods, and closing dates vary for each semester. Some faculties may have special application procedures which will depend on the subjects chosen. For more information contact the appropriate faculty office or the UTS Information Service.

## 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 year to year. In certain circumstances, students may not be required to pay all or part of one or more of the different components of the Service Fees.

For full details of variations and exemptions to the fees listed below, contact the UTS Information Service.

## Fee Components

### Union Entrance Fee

a once-only charge for new students \$20

### Union Fee

a semester-based charge for currently enrolled students \$100 per semester

### Students' Association Fee

a yearly charge for currently enrolled students \$48 per year

### Student Accommodation Levy

a yearly charge for currently enrolled students \$56 per year

### Student Identification Card Charge

a yearly charge for students enrolled on a tuition fee basis \$15 per year

## Course Fees

Some courses (not local undergraduate courses) at UTS attract a course fee. This is charged to students for the course itself, in addition to the Service Fees outlined above. The level of such fees is calculated by individual faculties on a course by course basis. Payment of course fees may vary depending on a student's status, and on conditions laid down by the faculty. Please contact your faculty office for full details.

Details of course fees are outlined under each course entry in this Handbook, but are subject to change. Always check with the faculty for the latest information.

## Course Fees for International Students

Annual Course Fees for undergraduate international students range from A\$11,500 to A\$16,500, and for postgraduate international students from A\$12,000 to A\$16,500. For more information contact the International Programs Office.

## Other costs

Students may incur other costs while they study at UTS. These may include books, photocopying, equipment hire, the purchase of computer software and hardware, and email and internet services.

The University's recommended internet service provider currently charges \$20 per month for 30 hours access or \$30 per month for \$70 hours access. These prices are subject to change.

## HECS

### (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 will vary 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 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.

For Autumn Semester the HECS census date is 31 March, and for Spring Semester the HECS census date is 31 August. HECS census dates for other teaching periods can be obtained from the UTS Information Service.

**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 HECS office on 1800 020 108 or the UTS Information Service.

## FINANCIAL HELP

### Austudy/Youth Allowance

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

Full-time students over 25 years old 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 Austudy are available from Student Services at Kuring-gai or City campuses.

Commonwealth legislation sets strict requirements over which the University has no control. It is important for the students concerned to understand these requirements.

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

For more information, talk to a student welfare officer in the Student Services Unit.

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

Application forms for both schemes should be lodged as soon as possible with any Centrelink office, or:

Centrelink Student Services  
Parker Street, Haymarket  
Locked Bag K710  
Haymarket NSW 2000

### 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 Centre for Australian Indigenous Studies, Education and Research.

Level 17, Tower Building  
telephone (02) 9514 1905

## UTS LIBRARY

The University Library collections are housed in three campus libraries which 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 assistance in finding information through Inquiry and Research Help Desks and training programs, loans, reservations, reciprocal borrowing and copying. The Library provides as much information as possible electronically so that users can also access it remotely. More information about the Library can be found at:  
<http://www.lib.uts.edu.au>

### City Campus Library

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

### Kuring-gai Campus Library

Eton Road, Lindfield  
telephone (02) 9514 5234

### Gore Hill Library

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

## RESEARCH OFFICE

The Research Office is responsible for ensuring that the University develops its research potential. It provides a broad range of services aimed at meeting the research goals of the University and its staff.

The main objectives of the Research Office include ensuring that a deep understanding of the research priorities, interests and capacity of the University, its research teams, centres and individual academics is maintained. It is involved in formulating policy and monitoring national trends in research policy and funding to position the University so that it can react to opportunities and challenges in key fields of research.

Research Office  
Level 7, Tower Building  
telephone (02) 9514 1252/1264/1419  
<http://www.uts.edu.au/research/ro/resoff.html>

## UNIVERSITY GRADUATE SCHOOL

The University Graduate School is a pan-university organisation which enhances the quality of graduate courses and supports research degree students, providing leadership in framing policy for postgraduate development in partnership with the faculties. It provides a contact point for postgraduate students and supports them in their studies.

The University Graduate School is located in Building B2, Blackfriars, City campus.

telephone (02) 9514 1336

<http://www.gradschool.uts.edu.au>

## SUPPORT FOR STUDENT LEARNING

The following services and facilities are available to all UTS students.

### Student Services

#### Transition to university programs

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. Students are informed of academic expectations, the skills needed to be an independent learner, and learning strategies which can help them successfully manage the work load. They are also provided with valuable information about how the university and its faculties operate, and the services provided.

For more information contact Student Services Unit.

telephone (02) 9514 1177 (City)

or (02) 9514 5342 (Kuring-gai)

#### Careers Service

The Careers Service offers career guidance, and assists with job placement for students seeking permanent or casual employment.

telephone (02) 9514 1471 (City campus)

#### Counselling

Counsellors are available at the City and Kuring-gai campuses for individual consultation, and group programs are also held throughout the year.

telephone (02) 9514 1471 (City campus)

or (02) 9514 5342 (Kuring-gai campus)

### Health

The Health Service offers a bulk billing practice to students at two locations:

telephone (02) 9514 1166 (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.

telephone (02) 9514 1509 (listings)

or (02) 9514 1199 (UTS accommodation)

### Special Needs Coordinator

Support is also available for students with special needs. Students with a physical, sensory or learning disability can contact the Special Needs Coordinator for information and advice.

telephone (02) 9514 1177

### Welfare

Welfare officers assist students with personal financial matters, including loan and financial counselling, Youth Allowance, Austudy and other Social Security claims and appeals advice.

telephone (02) 9514 1177

## Chemistry Learning Resources Centre

Room 211, Building 4, City campus.

Rosemary Ward

telephone (02) 9514 1729

email [rosemary.ward@uts.edu.au](mailto:rosemary.ward@uts.edu.au)

<http://www.science.uts.edu.au/depts/chem/clrc/index.html>

## English Language Study Skills Assistance (ELSSA) Centre

ELSSA Centre provides free English language and study skills courses for all UTS students.

ELSSA Centre

Alex Barthel (Director)

Level 19, Tower Building

telephone (02) 9514 2325

email [alex.barthel@uts.edu.au](mailto:alex.barthel@uts.edu.au)

or

Room 2-522

Kuring-gai campus

telephone (02) 9514 5160

<http://www.uts.edu.au/div/elssa/>

### **Physics Learning Centre**

Level 11, Tower Building (with an adjoining computer laboratory).

Peter Logan  
telephone (02) 9514 2194  
email [peter@phys.uts.edu.au](mailto:peter@phys.uts.edu.au)

### **Mathematics Study Centre**

Level 16, Tower Building; and at Kuring-gai campus, Room 2-522.

City campus  
Leigh Wood (Director)  
telephone (02) 9514 2268  
email [leigh@maths.uts.edu.au](mailto:leigh@maths.uts.edu.au)

Kuring-gai campus  
Dr Jules Harnett  
telephone (02) 9514 5186  
email [jules@maths.uts.edu.au](mailto:jules@maths.uts.edu.au)

### **Computer laboratories**

Computer laboratories are located throughout the University and are available for all students and staff to use. Details of locations and availability of the computer laboratories may be obtained from the Information Technology Division Resource Centre.

telephone (02) 9514 2118

#### ***Computer training***

In general, where computer training is necessary as part of a course that attracts HECS, it is provided.

### **Jumbunna Centre for Australian Indigenous Studies, Education and Research (CAISER)**

Jumbunna CAISER is run by a predominantly Australian indigenous staff who provide specialist advice and a range of services to assist Aboriginal and Torres Strait Islander students.

Jumbunna CAISER  
Level 17, Tower Building  
telephone (02) 9514 1902

## **EQUITY AND DIVERSITY**

It is the policy of the University of Technology, Sydney to provide equal opportunity for all persons regardless of sex, race, marital status, family responsibilities, disability, sexual preference, age, political conviction or religious belief. 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 Equity and Diversity Unit provides a range of services for students and prospective students. These include community outreach programs to support the participation of disadvantaged students/under-represented groups; 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 equity-related student grievances, including complaints about racism, sexism, sex-based harassment, homophobia, pregnancy/family responsibilities, or other equity issues.

Equity and Diversity Unit  
Level 17, Tower Building  
telephone (02) 9514 1084

## **OTHER SERVICES**

### **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, sports facilities and programs, stationery shops, a newsagency and resource centres. Off campus the Union provides access to a ski lodge, rowing club, sailing club, athletics club and basketball stadium.

Union Office (02) 9514 1444  
Haymarket (02) 9514 3369  
Kuring-gai (02) 9514 5011

### **Union Sports Centre**

The centre contains multi-purpose spaces, squash courts, weights rooms, circuit training room and climbing wall.

Lower ground floor, Building 4  
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 a.m. at both City and Kuring-gai campuses.

Students and staff of UTS receive priority access and a small rebate on fees. Normal Government assistance is available to low and middle income families.

telephone (02) 9514 1456 (City)  
or (02) 9514 2960 (Blackfriars)  
or (02) 9514 5105 (Kuring-gai)

### Co-op Bookshop

The Co-op Bookshop stocks the books on student's reading lists, and a variety of general titles and computer software. It has branches at the City and Kuring-gai campuses (Room 2.401), and, at the start of semester, at Haymarket and Gore Hill.

City campus  
telephone (02) 9212 3078  
email [uts@mail.coop-bookshop.com.au](mailto:uts@mail.coop-bookshop.com.au)

Kuring-gai campus  
telephone (02) 9514 5318  
email [kuringai@mail.coop-bookshop.com.au](mailto:kuringai@mail.coop-bookshop.com.au)  
<http://www.coop-bookshop.com.au>

### Students' Association

The Students' Association (SA) is the elected representative body of students at UTS: it is an organisation run by students for students. UTS students have the right to stand for election of the SA and to vote in the annual elections.

City campus office:  
Level 3 of the Tower Building  
telephone (02) 9514 1155

Kuring-gai campus office:  
(next to the cashier service)  
telephone (02) 9514 5237

### Freedom of Information

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

George Bibicos  
FOI Coordinator  
Level 4A, Tower Building  
telephone (02) 9514 1280  
email [George.Bibicos@uts.edu.au](mailto:George.Bibicos@uts.edu.au)

### Student Ombud

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

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

Room 402, Building 2  
City campus, Broadway  
telephone (02) 9514 2575  
email [ombuds@uts.edu.au](mailto:ombuds@uts.edu.au)

### Radio Station 2SER (107.3 FM)

2SER-FM is a community radio station run by hundreds of volunteers who are involved in producing and presenting a smorgasbord of programs focusing on education, information, public affairs and specialist music. Students interested in community media, are welcome to visit the 2SER studios or to attend a volunteer recruitment meeting. Contact the station for more details.

Level 26, Tower Building  
telephone (02) 9514 9514

### UTS Gallery and Art Collection

The UTS Gallery is a dedicated public gallery located on Level 4, Building 6, City campus, 702 Harris Street, Ultimo. The UTS Gallery presents regularly changing exhibitions of art and design from local, interstate and international sources.

The UTS Art Collection comprises a diverse range of paintings, prints, photographs and sculptures which are displayed throughout the University and, at times, in the UTS Gallery.

telephone (02) 9514 1284  
fax (02) 9514 1228  
<http://www.utsgallery.uts.edu.au>

## PRINCIPAL DATES FOR 2000

### January

- 6 UTS Advisory Day
- 7 Closing date for changes of preference to the Universities Admissions Centre (UAC), by mail or in person
- 8 Closing date (midnight) for changes of preference UAC Infoline
- 10 Formal supplementary examinations for 1999 Spring semester students
- 14 Final examination timetable for Summer session
- 14 Last day to submit appeal against exclusion from Spring 1999
- 21 Main Round of offers to UAC applicants
- 21 Last day to submit 'Show Cause' appeal for Spring 1999
- 24-29 Enrolment of new main round UAC Undergraduate students at City campus
- 25 Closing date for changes of preference to Universities Admissions Centre (UAC) for final round offers
- 26 Australia Day – public holiday
- 27 Public school holidays end
- 28 Last day to submit application for Postgraduate Equity Scholarships for Autumn semester 2000
- 28 Summer session ends (commenced 29 November 1999) for subjects with formal exams
- 31 Summer session examinations commence (to 11 February)

### February

- 3-16 Enrolment of new Undergraduate students at City campus (and 24-29 January)
- 1-11 Formal examinations for Summer session
- 4 Final round of offers (UAC)
- 4 Last day to lodge a Stage 2 appeal against assessment for Spring semester 1999

- 7 Closing date third round, Postgraduate courses for Autumn 2000 (except Faculty of Business – closing date 11 February)
- 14 Welcome and Registration for International Students – International Student Orientation programs commences and runs until 25 February
- 17 Official welcome and Study Success (Learning Skills) Program for all students studying on the Kuring-gai campus
- 17-18 Enrolment for International students
- 21-25 Orientation week for new students
- 21 Release of results for Summer session
- 21 Official Vice-Chancellor's welcome for all UTS students and commencement of Orientation 2000 (includes campus tours, student workshops, and the Study Success Program).
- 23 Union 'O' Day – Clubs and activities day
- 24 Late enrolment day
- 24/25 Faculty welcomes will be held on 24 or 25 February unless otherwise advised
- 28 Autumn semester classes commence

### March

- 10 Last day to enrol in a course or add subjects
- 17 Last day to pay upfront HECS or Postgraduate Course fees for Autumn semester 2000
- 31 Last day to apply to graduate in Spring semester 2000
- 31 Last day to apply for leave of absence without incurring student fees/charges<sup>1</sup>
- 31 Last day to withdraw from a subject without financial penalty<sup>1</sup>
- 31 HECS census date

**April**

- 7 Last day to withdraw from a course or subject without academic penalty<sup>1</sup>
- 17 Public School holidays commence
- 20 Provisional examination timetable available
- 21 Good Friday – public holiday
- 24-28 Vice-Chancellors' Week (non-teaching)
- 24 Easter Monday – public holiday
- 25 Anzac Day – public holiday
- 27-28 Graduation ceremonies (Kuring-gai)
- 28 Public School holidays end

**May**

- 1 Applications open for undergraduate courses, where applicable, and postgraduate courses for Spring semester 2000
- 15-26 Graduation ceremonies (City)
- 31 Closing date for undergraduate and first round postgraduate applications for Spring semester

**June**

- 2 Final examination timetable available
- 9 Last teaching day of Autumn semester
- 10-26 Formal examinations
- 12 Queen's Birthday – public holiday
- 29 Last day to submit application for Postgraduate Equity Scholarships for Spring semester 2000
- 30 Closing date second round Postgraduate applications for Spring semester

**July**

- 3 Public School holidays commence
- 3-7 Vice-Chancellors' Week (non-teaching)
- 3-7 Formal alternative examination period for Autumn semester students
- 4-13 Enrolments for Spring semester
- 10-14 International Students' Orientation Program
- 13 Study Success Learning Skills Program

- 13 Release of Autumn semester examination results
- 14 Public School holidays end
- 14 Formal supplementary examinations for Autumn semester students
- 17 Spring semester classes commence
- 21 Last day to withdraw from full year subjects without academic penalty
- 28 Last day to enrol in a course or add subjects
- 28 Last day to submit 'Show Cause' appeal for Autumn semester 2000

**August**

- 1 Applications available for undergraduate and postgraduate courses for Autumn semester 2001
- 18 Last day to pay upfront HECS or Postgraduate Course Fees for Spring semester 2000
- 31 Last day to withdraw from a course, a subject, or apply for leave of absence without academic or financial penalty<sup>1</sup>
- 31 Last day to apply to graduate in Autumn semester 2001
- 31 HECS census date (to be confirmed)

**September**

- 1 Applications for Postgraduate Scholarships available
- 8 Provisional examination timetable available
- 8 Last day of teaching before AVCC week/Olympics break
- 11 AVCC week/Olympics break (to 6 October)
- 11 Public School Holidays commence (to 2 October)
- 29 Closing date for undergraduate applications via UAC (without late fee)
- 29 Closing date for inPUTS Equity Access Scheme via UAC

## 14 General information

### October

- 2 Labour Day – public holiday
- 2 Public school holidays end
- 8 Provisional examination timetable available
- 9 Spring semester classes recommence
- 30 Graduation ceremonies (City) (to 3 November)
- 31 Closing date for undergraduate applications via UAC (with late fee)
- 31 Closing date for undergraduate applications direct to UTS (without late fee)
- 31 Closing date for most postgraduate courses for Autumn 2000 (some courses may have earlier closing dates in September)
- 31 Closing date for Australian Postgraduate Awards, the R. L. Werner and University Doctoral scholarships
- 31 Last day to submit application for Postgraduate Equity Scholarships for Summer semester 2001

### November

- 1-3 Graduation ceremonies (City)
- 3 Final examination timetable available
- 17 Last teaching day of Spring semester
- 18-30 Formal examination period (and 1-4 December)
- 30 Closing date for Undergraduate applications via UAC (with late fee)

### December

- 1-4 Formal examination period (and 13-30 November)
- 4 Summer session commences (ends 2 February 2001)
- 11-15 Formal alternative examination period for Spring semester students
- 20 Release of Spring semester examination results
- 20 Public School holidays commence
- 25 Christmas Day – public holiday
- 26 Boxing Day – public holiday

---

<sup>1</sup> HECS/Postgraduate course fees will apply after the HECS census date (31 March and August or last working day before).

**Note:** Information is correct as at 24 August 1999. The University reserves the right to vary any information described in Principal Dates for 2000 without notice.

# FACULTY INFORMATION

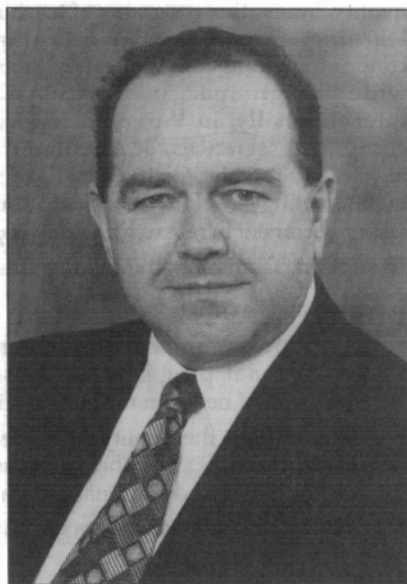
## MESSAGE FROM THE DEAN

I am pleased to extend this welcome to you on behalf of all the staff of the Faculty of Mathematical and Computing Sciences at UTS. Here I would like to highlight what the Faculty has to offer.

The Faculty has an enviable array of programs at the Bachelor's level. The BSc (Computing Science), with its industry linked components, continues to produce graduates who are keenly sought by industry. The Bachelor of Mathematics and Finance provides the business community with graduates who take a highly analytical and rigorous approach to the problems of modern international finance. The Bachelor of Information Technology is now in its eleventh year. Students in this program receive generous stipends from companies who are eager in return to hire graduates of the very highest quality. Graduates of the BSc (Mathematics) are well equipped to approach business problems that require the application of the various branches of mathematics.

The Faculty has a commitment to lifelong learning for experienced professionals. The Faculty offers a stable of postgraduate coursework and continuing professional education courses that are intended to satisfy various career development needs. The MSc in Computing offers an opportunity for professional update in a variety of streams. The Management Development Program for IT professionals provides a unique opportunity for management education to those with substantial experience in the IT industry.

In 1998, the Faculty launched two new postgraduate programs in partnership with industry and other UTS faculties. The graduate program in Internetworking aims to retrain practising IT people to support the explosive growth in Internet and Intranet technologies. This program has attracted large numbers of students who, in 1999, have been using a state-of-the-art Internetworking Laboratory. The other new graduate program is in Interactive Multimedia. This program is multi-disciplinary, equipping graduates to meet the multifaceted needs of the emerging multimedia industry.



*Professor Michael Fry*  
**Dean**

The Faculty has an international outlook and aims to become a faculty of high international standing. Significant numbers of high-quality international students have enrolled in our new Bachelor of Computing degree. This offers a mainstream program of computing and information systems.

The Faculty continues to develop its impressive research profile, with significant successes in 1999 in attracting research grants and industry funding. Among other achievements the Faculty is a leading participant in the CRC for Distributed Systems Technology.

There are many other activities and opportunities available within UTS that enrich the experience of university life. I commend these activities to you. Support services, provided by experienced and sympathetic staff, can help students through the difficult times that often arise. I hope that your time at UTS is both enjoyable and productive. I am confident that it will assist you in achieving both professional and personal success.

## FACULTY MISSION STATEMENT

The mission of the Faculty is to provide high-quality, innovative programs of teaching and learning, research and consulting, and continuing professional education to clients of wide backgrounds, both nationally and internationally, in the mathematical and computing sciences. It is committed to technology transfer for the benefit of society by interacting closely with industry, business and government in research and development.

To support its mission, the Faculty aims to:

### Teaching and learning

- maintain a comprehensive range of educational programs to satisfy the spectrum of needs in the community
- excel in both the quality of the learning environment and the professional relevance of its educational programs
- develop an international perspective to its teaching programs

### Research and scholarship

- excel in the quality of its research activities
- encourage and facilitate participation by all staff in research or scholarly activities while focusing its research activities onto its defined areas of strength and a small number of targeted areas for development
- increase the participation rate of students in postgraduate programs
- promote intra-faculty, interfaculty, national and international research collaboration
- emphasise to staff and students the benefits of an international perspective on their disciplines

### Management and resources

- assure the quality of activities within the Faculty through the ongoing monitoring and the continuous development of a range of quality control processes
- maintain a balanced portfolio of expertise within its staff, which reflects perceived trends within the industries and disciplines addressed by the Faculty
- seek supplementary sources of external funding through research, joint ventures and entrepreneurial activities
- ensure the principles of equity are observed in all aspects of the Faculty's work, with particular emphasis on the areas of importance identified in the UTS Equity Plan
- develop links with prestigious overseas universities and research institutions

### Community service

- preserve strong, effective links with industry, government, business, professional and community organisations
- improve credit transfer arrangements to facilitate the movement of properly prepared students who wish to transfer between universities, or who move into the university sector with prior education and knowledge.

## INFORMATION FOR MATHEMATICAL AND COMPUTING SCIENCES STUDENTS

*Only new students and those enrolled in courses that have undergone major changes will receive a free handbook.*

The Faculty of Mathematical and Computing Sciences consists of two Schools – Mathematical Sciences and Computing Sciences. Together, these disciplines form the basis of ‘enabling technologies’ for applications in most other disciplines.

Each School teaches towards its own professional degrees from undergraduate through to Doctoral studies. Although student administration functions are centralised at faculty level, all the courses and much of the staff and research management are conducted at the school level. Each School has, as a consequence, developed its own management structure appropriate for the support of its teaching and research programs. Teaching is carried out across all campuses of the University.

The Faculty has a commitment to cooperative education, of both the work experience ‘sandwich’ form, and the cooperative scholarship format. The Faculty is active in research and has close liaison with industry in all aspects of its work.

The structure of the **School of Mathematical Sciences** reflects the orientation and emphases of its academic programs. There are two discipline groups:

Mathematics

Statistics and Operations Research

The School also provides a support service to all students of the University studying in various introductory mathematical or quantitative areas through its **Mathematics Study Centre**, under the directorship of Leigh Wood. The services of the Centre are available at the City and Kuring-gai campuses. Most of the teaching in the Centre occurs at an individual level and the Centre is open for at least 30 hours each week, with certain times devoted to particular areas of mathematics. Students can obtain help with individual problems specific to a particular course. Alternatively, students with more systematic problems may study in the Centre on a regular basis, obtaining assistance from a tutor as necessary.

The structure of the **School of Computing Sciences** reflects the orientation and emphases of its academic work. There are four discipline groups:

Computer Systems

Computing Methods

Information Systems Technology

Information Systems Management

The **Centre for Object Technology Applications and Research (COTAR)**, established in 1994, provides a focal point for the software industry using, or considering using, the new software development techniques of object technology. COTAR aims to promote and conduct research in object-oriented software engineering, object-oriented information systems and object-oriented computing. It provides not only a focus for such research and collaborative work with industry, but also high-quality professional development education. Further information can be obtained from Professor Brian Henderson-Sellers on (02) 9514 1687.

The mission of the **CRC for Distributed Systems Technology (DSTC)** is to build the distributed information systems of the future through leading-edge research, and to work with industry and government to apply and commercialise the results. The UTS participation in DSTC draws on expertise from the School of Computing Sciences. The primary focus of the UTS research is on Quality of Service (QoS) and the delivery of multimedia information in real time within various distributed systems frameworks, such as the World Wide Web, JAVA and CORBA. For further information contact Professor Michael Fry on (02) 9514 1801.

## 18 Faculty information

### Faculty Office contacts

Faculty Office staff are located on the third floor of Building 4, as indicated below. There is an Information Office at this location to assist students and the general public on course-related matters. When telephoning from outside the University, all extension numbers should be prefixed by (02) 9514.

Email addresses should be suffixed with '@mcs.uts.edu.au'.

	Ext	Bldg/ Room	Email	Student administration responsibility
<i>Dean</i>				
Professor Michael Fry	1801	4/343	mike	—
<i>Executive Assistant to the Dean</i>				
Julie Oliffe	1800	4/342	julie	—
<i>Faculty Business Manager</i>				
Gerard Goodwin-Moore	1880	4/341	gerard	—
<i>Technical Services Manager</i>				
Peter Gale	1868	4/435	gale	—
<i>Faculty Operations Manager</i>				
Leanne McCoy	1867	4/340a	leanne	All courses
<i>Promotions Officer</i>				
Jenny Donovan	1263	4/335	jennyd	—
<b>Student administration</b>				
<i>Professional Programs Manager</i>				
Alison Stevens	1925	4/339	alison	Management Development Program
<i>Industry Liaison Officer</i>				
Des Saunders	1804	4/336	des	BInfTech and Industrial Training
<i>Graduate Administration Officer</i>				
Layla Abraham	1806	4/338b	layla	All postgraduate programs
<i>Student Liaison Officers</i>				
Ivy Chu	1802	4/337	ivy	All BSc (Comp Sc)
Jo Smith	2250	4/338a	josmith	All BSc (Maths), BMathFin, and related Honours programs
<i>Liaison Officers</i>				
Lyn Chamas	2154	4/335	lynette	General inquiries
William Kusuma	1866	4/335	william	General inquiries
Edna Pathmanathan	1308	4/335	edna	General inquiries

## Continuing Professional Education (CPE)

The Faculty offers a variety of CPE courses each semester.

The School of Computing Sciences offers courses in programming, such as Object-oriented Programming with C++, Using UNIX, Programming with C, Prototyping with Visual Basic, Programming on the Internet, and Electronic Commerce on the Internet, and professional courses in three-dimensional computer animation, database design, expert systems design and distributed databases, and client/server computing.

A range of CPE courses, such as the Introductory Statistics Workshop, are run by the School of Mathematical Sciences. In addition, mathematics preparation courses such as Intensive Mathematics, Intensive Statistics and Preparation for Nursing are available through the Mathematics Study Centre.

Information on all CPE courses is available from the Faculty Information Office on (02) 9514 1803 or via the World Wide Web at:

<http://www.socs.uts.edu.au/cpe>

## Sub-majors offered to students enrolled in other faculties

The Faculty offers a number of sub-majors to students enrolled in other faculties. Students wishing to enrol in a sub-major offered by the Faculty of Mathematical and Computing Sciences should first contact the Faculty Information Office on (02) 9514 1803.

In all cases, enrolment will be subject to students obtaining the permission of their home faculty, and their satisfying all prerequisite requirements.

Students should refer to the relevant School's 'Subject descriptions' section at the back of this handbook for prerequisite details.

### Sub-majors offered by the School of Mathematical Sciences

The following sub-majors are currently available to students enrolled in any faculty.

#### Mathematics (24cp)

The Mathematics sub-major provides a foundation of knowledge in mathematics sufficient for further development in the discipline and its application to quantitative areas of business, particularly finance. It contributes key critical, analytical and quantitative skills.

#### Sequence

35101	Mathematics 1	6cp
35102	Mathematics 2	6cp
35212	Linear Algebra <sup>1</sup>	6cp
35231	Differential Equations	6cp

<sup>1</sup> 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.

### Operations Research (24cp)

The Operations Research sub-major provides students with a level of knowledge necessary for the application of the discipline in areas of relevance to business, particularly mathematical programming (optimisation), scheduling and transportation, inventory analysis and financial modelling.

#### Sequence

33401	Introductory Mathematical Methods	6cp
35241	Optimisation 1 <sup>1</sup>	6cp
<i>two subjects chosen from</i>		
35342	Optimisation 2	6cp
35344	Network Optimisation	6cp
35361	Probability and Stochastic Processes	6cp
35363	Simulation Modelling	6cp

<sup>1</sup> The subject 25406 Quantitative Techniques for Finance and Economics is accepted as a prerequisite for 35241 Optimisation 1. Otherwise, students must include 35140 Operations Research Modelling in the sub-major, and choose only one of the final three subjects above.

### Statistics (24cp)

The Statistics sub-major provides students with a level of knowledge necessary for the application of the discipline in areas of relevance to business, particularly regression methods, design and analysis of statistical experiments, and stochastic processes.

#### Sequence

33401	Introductory Mathematical Methods	6cp
35252	Statistics 2	6cp
<i>two subjects chosen from</i>		
35353	Regression Analysis	6cp
35355	Quality Control	6cp
35356	Design and Analysis of Experiments	6cp
35361	Probability and Stochastic Processes	6cp

### Sub-majors offered by the School of Computing Sciences

The following sub-majors are currently available to students enrolled in any faculty as long as they meet any prerequisite requirements.

## 20 Faculty information

### ***Business Analysis and Design/ Databases (24cp)***

This sub-major provides students with a detailed knowledge of current, state-of-the-art databases – relational, object-oriented and distributed – and the analysis and design needed to use them.

#### **Sequence**

31424	Systems Modelling	6cp
31511	Systems Design	6cp
31434	Database Design	6cp
	<i>and one of</i>	
31443	Distributed Databases and Client/ Server Computing	6cp
31921	Objectbases	6cp

### ***Business Information Systems (24cp)***

This sub-major is available to Accounting students in particular.

#### **Sequence**

31414	Information Systems	6cp
31424	Systems Modelling	6cp
31508	Programming Fundamentals	6cp
31434	Database Design	6cp

### ***Business Information Technology (24cp)***

This sub-major provides students with a broad overview of the basics of computer hardware and software and major applications.

#### **Sequence**

31508	Programming Fundamentals	6cp
31424	Systems Modelling	6cp
31434	Database Design	6cp
31512	Networking 1	6cp

### ***Computer Graphics (24cp)***

This sub-major provides students with an opportunity to study the area of computer graphics in-depth.

#### **Sequence**

31140	Introduction to Computer Graphics	6cp
31605	Computer Graphics Rendering Techniques	6cp
31603	3D Computer Animation	6cp
31352	Project	6cp

**Note:** The subject 31352 Project will involve an in-depth investigation of an area of computer graphics involving programming. Students will not be allowed to commence the project until they have successfully completed 31605 Computer Graphics Rendering Techniques.

### ***Electronic Commerce (General) (24cp)***

This sub-major is suitable for students from all faculties, and emphasises the analysis and system design skills and applications of technology to develop systems.

#### **Sequence**

31512	Networking 1	6cp
31749	Internet Commerce	6cp
31950	Networked Enterprise Design	6cp
31606	Virtual Communities	6cp

**Note:** In some circumstances, the subject 31436 System Software and Networks may substituted for 31512 Networking 1.

### ***Electronic Commerce (Technical) (24cp)***

This sub-major is suitable for students from the Faculty of Engineering or the School of Computing Sciences, and emphasises technical implementation issues and program and system development skills.

#### **Sequence**

31512	Networking 1	6cp
31749	Internet Commerce	6cp
31748	Programming on the Internet	6cp
31750	Intelligent Agents in Java	6cp

**Note:** Under some circumstances, the subject 31436 System Software and Networks may substituted for 31512 Networking 1.

### ***Human Factors and Computing in Business (24cp)***

The sub-major on Human Factors and Computing in Business provides students with an insight into the effect that computers and information technology have on staff and the workplace, particularly in a climate of change.

#### **Sequence**

31424	Systems Modelling	6cp
31511	Systems Design	6cp
31777	Human-Computer Interaction	6cp
	<i>and one of</i>	
31950	Networked Enterprise Design	6cp
31736	Business Processes and IT Strategy	6cp

**Information Technology (32cp)**

This sub-major is available to Information Studies students.

**Sequence**

31508	Programming Fundamentals	6cp
31424	Systems Modelling	6cp
31434	Database Design	6cp
31512	Networking 1	6cp
	Electives (chosen from Computing electives for which students have the prerequisites)	6cp or 12cp

**Information Technology major (48cp)**

The Information Technology major is available to international students in the Faculty of Business and to students in the School of Mathematical Sciences.

**Sequence**

31414	Information Systems	6cp
31424	Systems Modelling	6cp
31509	Computer Fundamentals	6cp
31434	Database Design	6cp
31508	Programming Fundamentals	6cp
31512	Networking 1	6cp
	Electives (chosen from Computing electives for which students have the prerequisites)	12cp

**Programming and Design (24cp)**

The Programming and Design sub-major provides students with skills in systems modelling and design, and object-oriented and procedural programming.

**Sequence**

31508	Programming Fundamentals	6cp
31424	Systems Modelling	6cp
31429	Procedural Programming	6cp
31434	Database Design	6cp

**Information Technology Specialisations in the MBA****Business Information Technology**

This sub-major and major are designed for students with little, or no, IT background.

**Sub-major**

32531	Global Information Systems	6cp
32532	Conducting Business Electronically	6cp
32606	Database	6cp
32607	Systems Analysis	6cp

**Major**

31511	Systems Design	6cp
32517	Commerce on the Internet	6cp
32531	Global Information Systems	6cp
32532	Conducting Business Electronically	6cp
32533	Networking Communities	6cp
32534	Knowledge Management	6cp
32606	Database	6cp
32607	Systems Analysis	6cp

**Strategic Information Technology**

This sub-major and major are designed for students with at least an IT major at undergraduate level and for some subjects, at least four years' experience in the industry would be required.

**Sub-major**

32517	Commerce on the Internet	6cp
32531	Global Information Systems	6cp
32532	Conducting Business Electronically	6cp
32533	Networking Communities	6cp

**Major**

32204	Advanced Data Management <sup>1</sup>	6cp
32208	Information Processing Strategy <sup>1</sup>	6cp
32517	Commerce on the Internet	6cp
32531	Global Information Systems	6cp
32532	Conducting Business Electronically	6cp
32533	Networking Communities	6cp
32534	Knowledge Management	6cp
32604	Systems Integration <sup>1</sup>	6cp

<sup>1</sup> IT work experience required.

## 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 last for one semester and have a value of eight credit points.

### Language studies

All students wishing to engage in language studies as a credited part of their degree are required to enrol through the Institute for International Studies, whether the language studies are undertaken at UTS or elsewhere. The Institute teaches some language programs at UTS, has made arrangements with other universities for some languages to be taught to UTS students, and can make special arrangements for individual students to attend specific language programs where academic needs demand. The individual student's level of language proficiency before entry to the UTS program determines his or her level of language study. There is a range of entry levels to the various programs available. Most are available at beginners' and post-HSC levels, and some at more advanced levels.

The Institute for International Studies offers Language and Culture programs in Cantonese, Chinese, Indonesian, Japanese, Malaysian, Spanish, French, German and Italian on UTS campuses through arrangements with the Insearch Language Centre. Higher levels of these languages may be offered through arrangements with other universities in the Sydney area.

Greek, Russian, and Thai are offered to UTS students through arrangements that have been made with other Sydney universities.

### Contemporary Society

The Institute also offers a series of subjects that provides an introduction to the contemporary societies, politics, economies and cultures of the countries of East and South-East Asia, Latin America and Western Europe, which are the areas of specialisation of the Institute.

The following majors are offered: Argentina, Australia and the Asia-Pacific Region, Chile, China, France, Germany, Greece, Indonesia, Italy, Japan, Malaysia, Mexico, Russia, South China, Spain, Taiwan, Thailand and Vietnam. There are also sub-majors in specialist countries and languages other than English. Details of the International Studies subjects are available in the *Institute for International Studies Handbook*.

Students should consult the Academic Administrator at the Institute for International Studies, UTS, 10 Quay Street, Ultimo, NSW 2007, telephone (02) 9514 1574, fax (02) 9514 1578, or the *Institute for International Studies Handbook*, for further details.

## Statement of good practice and ethics in informal assessment

### Aims of assignments

In many subjects offered by the Faculty, students undertake assessment tasks in the form of assignments. The setting of assignments is intended to promote a number of educational aims, including furthering each student's learning of the subject, particularly the acquisition of practical skills; providing a means for staff to assess each student's learning; providing feedback to the student on his or her progress in learning; and providing feedback to staff on the effectiveness of their teaching.

These aims can be subverted if students deceive staff about the authorship of their work.

### Acceptable behaviour

#### Using sources

Whenever anything from someone else's work is used, it is standard practice to indicate exactly where the information comes from. Acknowledgment is achieved by using a standard system of referencing, such as footnotes, end notes, the Harvard system etc. *The Guide to Writing Assignments* (available from the Co-op Bookshop) explains how to use all these standard systems of reference.

### Collaboration

In some cases assignment guidelines may permit or require students to cooperate in developing a solution to part or all of an assignment. This may occur formally when a staff member assigns students to groups and indicates which components of the assignment they are to work on as a group and which components they are to work on individually.

It may also occur informally. For example, some assignments may involve an 'ideas gathering' phase followed by an 'execution' phase. Students may be permitted to collaborate informally on the preliminary phase(s), but be expected to work completely individually on the subsequent phase(s). In a programming assignment, for example, it is

normally acceptable for one student to discuss with another student (or other person) the specifications of the task so as to determine the requirements (see below). Whether this collaboration could extend to subsequent phases (such as the design phase) would depend on the assignment guidelines; normally, collaboration in the design and subsequent phases is not permitted.

Depending on the type of assignment and degree of collaboration permitted it is possible to define several categories of collaboration:

- individual effort (the student is required to work on all phases entirely by himself or herself);
- group effort (the student is required to work on all phases as part of a formal group);
- mixed effort (the student is required or permitted to work on some or all phases as part of a formal or informal group).

Unless assignment guidelines specifically state otherwise, **a student should assume that an assignment requires a completely individual effort.** The forms of cooperative collaborative behaviour that are acceptable under most circumstances are:

- discussing assignment specifications with another student (or other person) with a view to clarifying what is required;
- getting help from another student (or other person) on technical matters that are not directly part of the assessment task (e.g. on how to use some facility provided by the computer system, such as the editor);
- getting help from another student (or other person) in debugging a program. This is a common occurrence in computing; and
- obtaining help from a tutor.

Generally, what distinguishes the acceptable cases of collaborative behaviour from the unacceptable ones is the student's intention to deceive. For example, in an assignment requiring a completely individual effort, a student may encounter some snag, such as an unfamiliar compiler diagnostic. If the student were to seek help from another student (or person) to remove the snag, then this would normally be considered acceptable behaviour. If, however, several students designed and coded a solution together, then disguised this collaboration, that would be unacceptable behaviour.

## Unacceptable behaviour

### *Outright lying*

This is seen most often in programming assignments, where the program does not run, or runs incorrectly, yet the output handed in is correct. The output has been 'tailored' using a word processor in an attempt to fool the marker. Lying is never acceptable behaviour.

### *Plagiarism*

Plagiarism is the action of taking and using as one's own the thoughts, writings or inventions of another with the intention to deceive.

For example, if one student in a computing subject were to obtain a copy of another student's (or other person's) program, were to modify parts of the program (e.g. change variable names) so as to disguise its origin, and then submit the modified program as his or her solution, then this would be considered plagiarism.

As another example, a student may obtain all or a major part of the solution to an assignment problem from a text book and, without acknowledging this, submit the solution as his or her own work.

As a further example, a student may use a source of information in an essay, without acknowledging the source. Such plagiarism may range from a sentence or two, or a table or diagram, to occasional cases where the entire paper consists of material copied from a book with only a few sentences added by the student. The student thus submits another's ideas as his or her own work.

Plagiarism is a form of cheating and is never acceptable.

### *Collusion*

Collusion occurs when a student combines with one or more other students (or other persons) to produce a common essay or solution to part or all of an assignment, disguises the shared origin of the solution, and submits the solution as his or her own individual work.

Collusion is regarded as a form of cheating and is never acceptable.

### Graduation ceremonies

University graduation ceremonies are held in the Autumn and Spring semesters of each year. All students should take note of the Academic Board policy on late approval of graduands which states that 'any graduands who have their results confirmed **after** the appropriate Academic Board meeting should **not** be eligible to graduate at the immediately forthcoming ceremony'. Any graduand who is approved, through exceptional circumstances, to attend a ceremony after the Academic Board deadline may not have his or her name included in the Graduation Program.

### Environmental Health and Safety

The Faculty has an Environmental Health and Safety Plan, copies of which are available from either Information Office, or on the School and Faculty World Wide Web pages. Staff and students should familiarise themselves with the plan and comply with all hazard procedures outlined in it.

The names and locations of First Aid Officers, and of first aid kits, are indicated by appropriate signs in Faculty and School areas.

### Insearch Institute of Commerce

Insearch Institute of Commerce, which is wholly owned by the University of Technology, Sydney, offers a Foundation Studies Certificate program in Mathematics and Computing Science and a Diploma program in Information Technology. These programs are designed, taught and supervised by the Faculty of Mathematical and Computing Sciences staff for students who are not currently qualified for direct university entry. While the University cannot guarantee admission to its degree programs (except for international students), students who have completed the Foundation Studies Certificate program may apply for admission to the first year of the Bachelor of Mathematics, Bachelor of Mathematics and Finance, or Bachelor of Computing. If admitted, students who have completed the Diploma program may be granted up to one year's advanced standing in the Bachelor of Computing (international students only) or Bachelor of Science (Computing Science) degrees.

For further information contact:

Registrar, Insearch Institute of Commerce  
10 Quay Street, Haymarket  
telephone (02) 9281 8188  
fax (02) 9281 9875  
email [Courses@insearch.edu.au](mailto:Courses@insearch.edu.au)

## LIST OF COURSES AND CODES

Course title	Code
<b>School of Mathematical Sciences</b>	
Bachelor of Mathematics and Computing	MM07
Bachelor of Mathematics and Finance <sup>1</sup>	MM03
Bachelor of Mathematics and Finance (Honours) <sup>1</sup>	MM04
Bachelor of Mathematics and Finance/Bachelor of Arts in International Studies <sup>1</sup>	MM06
Bachelor of Science in Mathematics <sup>1</sup>	MM01
Bachelor of Science (Honours) in Mathematics <sup>1</sup>	MM02
Bachelor of Science in Mathematics/Bachelor of Arts in International Studies <sup>1</sup>	MM05
Graduate Certificate in Mathematical Sciences	MM56
Graduate Diploma in Applicable Mathematics	MM67
Graduate Diploma in Mathematics and Finance <sup>1</sup>	MM66
Graduate Diploma in Operations Research	MM52
Graduate Diploma in Statistics	MM65
Master of Science (by thesis)	MM51
Master of Science in Operations Research (by coursework)	MM53
Doctor of Philosophy	MM54
<b>School of Computing Sciences</b>	
Bachelor of Computing	MC06
Bachelor of Computing/Bachelor of Arts in International Studies	MC07
Bachelor of Information Technology	MC03
Bachelor of Science in Computing Science	MC02
Bachelor of Science (Honours) in Computing Science	MC08
Bachelor of Science in Computing Science/Bachelor of Arts in International Studies	MC05
Bachelor of Science in Computing Science/Bachelor of Laws	LL06
Graduate Certificate in Information Technology	MC67
Graduate Certificate in Information Technology Management	MC63
Graduate Certificate in Interactive Multimedia	MC72
Graduate Certificate in Internetworking	MC82
Graduate Diploma in Information Technology	MC52
Graduate Diploma in Information Technology Management	MC75
Graduate Diploma in Interactive Multimedia	MC71
Graduate Diploma in Internetworking	MC81
Master of Business in Information Technology Management	MC85
Master of Interactive Multimedia	MC70
Master of Science (by thesis)	MC51
Master of Science in Computing	MC53
Master of Science in Internetworking	MC80
Doctor of Philosophy	MC54

<sup>1</sup> Under review at time of printing.

**Note:** All inquiries regarding courses should be directed to the Faculty Information Office on (02) 9514 1803.

## SCHOOL OF MATHEMATICAL SCIENCES

---

The School of Mathematical Sciences offers five courses leading to Bachelor's degrees, postgraduate courses leading to qualifications at the Graduate Certificate, Graduate Diploma and Master's levels, and two research degree programs leading to Master's and Doctoral level qualifications. They are:

- the Bachelor of Mathematics and Computing, which is a three-year Pass degree, offered in conjunction with the School of Computing Sciences. Students who graduate from this degree at a sufficiently high standard will be eligible to apply for entry to either the Bachelor of Science (Honours) in Computing Science course or the Bachelor of Science (Honours) in Mathematics course;
- the Bachelor of Mathematics and Finance, which is a three-year Pass degree with a fourth year Honours degree, offered in conjunction with the School of Finance and Economics;
- the combined Bachelor of Mathematics and Finance and Bachelor of Arts in International Studies, which is a five-year degree, with an additional year of advanced study to fulfil the requirements of the Bachelor of Mathematics and Finance (Honours) degree, offered in conjunction with the Institute for International Studies and the School of Finance and Economics;
- the Bachelor of Science in Mathematics, which is a three-year Pass degree with a fourth year Honours degree;
- the combined Bachelor of Science in Mathematics and Bachelor of Arts in International Studies, which is a five-year degree, with an additional year of advanced study to fulfil the requirements of the Bachelor of Science (Honours) in Mathematics degree, offered in conjunction with the Institute for International Studies;
- the Graduate Certificate in Mathematical Sciences;
- the Graduate Diploma in Applicable Mathematics;
- the Graduate Diploma in Mathematics and Finance;
- the Graduate Diploma in Operations Research;
- the Graduate Diploma in Statistics;
- the Master of Science in Operations Research (by coursework);
- the Master of Science, which is awarded on the basis of supervised research and presentation of a thesis; and
- the Doctor of Philosophy, which is awarded on the basis of supervised research and presentation of a thesis.

### Computing facilities

Many of the courses offered by the School involve a substantial amount of computational work, with intensive use being made of specialised software designed for applications in mathematics, statistics and operations research. Students have access to the full range of the Faculty's computing resources via a number of laboratories located in Buildings 1 and 4 that are connected by a high-speed network. Extensive use is also made of the University's central computing facilities, which are accessible both from the Faculty's laboratories and from laboratories operated by the Information Technology Division.

The School is actively involved in two major regional computing consortiums. The NSW Centre for Parallel Computing operates a high performance parallel computer, located at the Australian Technology Park. The Vislab Consortium provides scientific visualisation research facilities via the University of Sydney and the Australian Technology Park, and local nodes located at each of the partner institutions, including UTS.

### Mathematics Study Centre

The Mathematics Study Centre provides a support service to all students of the University studying in various introductory mathematical or quantitative areas, including statistics. The Centre coordinates all mathematics support services across the University, and is available on both the City and Kuring-gai campuses.

### Drop-in service

The Centre is open each day during semester, including tutorial and study weeks. It is open two nights a week and on 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 of Centre lecturers with their particular areas of expertise is available from both branches of the Centre and from its web site (see 'Contact details' below).

### 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, Engineering, Business, Nursing, Teacher Education and Information Studies.

#### 94434, 94435, 94436

##### Mathematics Tutorial 1, 2, 3

These subjects consist of approximately one hour tuition per week during semester time. These subjects are free of HECS charges and carry no credit point value.

#### 94437, 94438, 94439

##### Mathematics Study 1, 2, 3

These subjects consist of approximately two hours tuition per week during semester time. These subjects are free of HECS charges and carry no credit point value.

### Workshops

The Centre runs Saturday workshops during semester and in the final examination period for many first-year mathematics and statistics subjects. They are timed to assist students in their preparation for quizzes and the final examination, and are popular with students from all faculties.

#### 94431, 94432, 94433, 94440, 94441, 94442

##### Mathematics Workshop 1, 2, 3, 4, 5, 6

These subjects consist of approximately six hours of instruction, usually on a Saturday. These subjects are free of HECS charges and carry no credit point value.

### Individual assistance

It is possible for students to arrange individual assistance with mathematics. 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. Much of this is done with counselling support from Student Services.

### Bridging subjects

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

#### 94450

##### Introduction to Statistics

This is a 12-hour subject, run over four evenings in February. It is designed for students about to enter introductory statistics or research methods subjects. This subject is free of HECS charges and carries no credit point value.

#### 94470

##### Introduction to Computers for Beginners

This is a 12-hour subject, run day and evening in February. It is designed for students who are not familiar with computers and aims to develop confidence, an understanding of terminology and some basic skills. This subject is free of HECS charges and carries no credit point value.

#### 94480

##### Bridging Mathematics

This is a 24-hour subject, 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. This subject is free of HECS charges and carries no credit point value.

**94490****Mathematics Preparation for Nursing**

This is a 12-hour subject, 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.

**Foundation courses**

The Centre runs three fee-paying courses each year to prepare students for university studies the following year. Students completing these courses have had success in gaining entry to university and in completing their degree studies.

Foundation Mathematics begins in August and runs for one 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 such as Engineering, Science and Business – that require some mathematical skills.

Preparation for Nursing is a course aimed at giving potential Nursing students the prerequisite knowledge in mathematics and science for their degree studies. This course runs in October and November each year.

**Location**

City campus: Building 1, Room 1615  
Kuring-gai campus: Room K2-522

**Opening hours**

The Mathematics Study Centre is open from Monday to Friday during semester, including tutorial and study weeks. The Centre will be open on some evenings to cater for part-time students. Detailed timetables are available at the Centre and on its web site (see 'Contact details' below).

**Contact details**

For further information, students should contact the Director of the Mathematics Study Centre, Leigh Wood, telephone (02) 9514 2268, email L.Wood@maths.uts.edu.au. The Centre's web site may be found at the URL:

<http://www.maths.uts.edu.au/msc/>

**Mathematica**

The University operates a site licence 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 School. Students' exposure to *Mathematica* begins in the first semester of the BSc, BMathComp and BMathFin degree programs and knowledge of the system expands as the course develops. By the time of graduation, all students will have acquired considerable expertise in the use of this software.

**Subject exemptions**

Students undertaking courses offered by the School and who have successfully completed subjects at other tertiary institutions, may be eligible for exemptions where the subjects previously studied are deemed to be equivalent to those specified for the current course. Eligibility is determined by the Faculty and follows University Rule 2.28 on Advanced Standing. The rule is given in full in the *UTS Calendar*.

Students should apply for exemptions at enrolment or immediately following enrolment. Students applying for exemptions should complete all details on the Application for Subject Exemption form which is available from the University Information Centre (Level 4, Building 1). Original transcripts must be sighted or certified copies attached to support the application. A copy of the other institution's handbook or relevant subject syllabuses must be produced on request. The form and supporting materials should then be taken to the Exemptions Coordinator. It is preferable that such requests be made in person should further clarification be required. Further information can be obtained from the Faculty Office on (02) 9514 1803.

## PRIZES

The School of Mathematical Sciences awards the following prizes and scholarships annually.

### Foundation for Australian Resources Prizes

The Foundation for Australian Resources is an independent non-profit organisation whose nominated beneficiary is the Faculty of Mathematical and Computing Sciences. The Foundation has made available three prizes to students enrolled in courses run by the School 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.

### Macquarie Bank Scholarship

The Macquarie Bank has provided a scholarship to the student obtaining the highest weighted average mark in the standard full-time program of the first year of the Bachelor of Mathematics and Finance degree, provided that mark exceeds 75. Each scholarship has a value of \$7,500 and is disbursed as three sums of \$2,500, one for each year of the course.

### 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.

### Statistical Society of Australia Prize in Statistics

In 1980 the Statistical Society of Australia NSW Branch established a prize for excellence in Statistics. This prize is now awarded to the student who is first in order of merit of those students completing the Statistics strand of the Bachelor of Science (Honours) in Mathematics degree. The prize is a cash award of \$200.

## School contacts

All staff of the School of Mathematical Sciences are located on Levels 15 and 16 of the Tower Building (Building 1) on the City campus (Broadway).

When telephoning from outside the University, all extension numbers should be prefixed with (02) 9514.

All email addresses should be suffixed with '@maths.uts.edu.au'.

Name	Ext	Room	Email
Professor Lindsay Botten	2247	1528	L.Botten
<i>Deputy Head of School, Director, Postgraduate Studies, and Head, Mathematics Unit</i>			
Associate Professor Graeme Cohen	2262	1520	G.Cohen
<i>inpUTS Coordinator for students with special needs and Academic Liaison Officer</i>			
Mary Coupland	2241	1535	M.Coupland
<i>Exemptions Coordinator</i>			
Layna Groen	2266	1533	L.Groen
Dr Jules Harnett	5186	K2-522	J.Harnett
<i>Graduate Certificate Coordinator</i>			
Jeff Hogg	2238	1524	J.Hogg
Dr Tim Langtry	2261	1537	T.Langtry
<i>Electives Coordinator</i>			
Ed Lidums	2235	1530	E.Lidums
Dr Beverley Moore	2258	1550	B.Moore
<i>Head of School</i>			
Associate Professor Gordon McLelland	2259	1520	G.McLelland
<i>Professor of Mathematics</i>			
Dr Alex Novikov	tba	1541	tba
<i>Honours Coordinator</i>			
Dr Peter Petocz	2264	1531	P.Petocz
Professor Eckhard Platen	2271	1527	E.Platen
<i>Director, Undergraduate Studies</i>			
Dr Geoff Smith	2236	1532	G.Smith
Narelle Smith	2239	1539	N.Smith
<i>Head, Statistics and Operations Research Unit</i>			
Associate Professor Deborah Street	2251	1540	D.Street
Ron Sorli	2281	1548	R.Sorli
<i>Director, Mathematics Study Centre</i>			
Leigh Wood	2268	1536	L.Wood
<i>Executive Assistant to Head of School</i>			
María J Román	2249	1520	M.Roman
Peter Wright	2243	1546	P.Wright
Dr Yakov Zinder	2279	1523	Y.Zinder

# UNDERGRADUATE COURSES

## Bachelor of Science in Mathematics

- ◆ *Course code: MM01*
- ◆ *Testamur title: Bachelor of Science in Mathematics*
- ◆ *Abbreviation: BSc*
- ◆ *Course fee: HECS*

This degree aims to prepare students for employment in industry, commerce and government and to provide the foundation for higher studies in mathematics. It provides 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.

### Structure of the degree

The course consists of subjects worth a total of 144 credit points and may be attempted on either a full-time or a part-time basis. The standard full-time load is 24 credit points per semester (typically, four subjects each worth six credit points) and the standard part-time load is 12 credit points per semester (typically, two subjects both worth six credit points). Most mathematics subjects worth six credit points involve four hours of class contact per week (typically, three hours of lectures and one hour of tutorial), although some first-year subjects have a higher contact load of six hours. Some subjects have additional laboratory hours.

Part-time students will be accommodated by the provision of evening classes for most subjects. It is expected that part-time students will be 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.

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

The basic structure of the Pass degree is as follows:

### The core

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.

### The major

This 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 either mathematics, statistics or operations research. 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. Demand for the Mathematics major is not always sufficient for it to be offered.

### Electives

These occupy 36 credit points of the course 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.

## Grading of awards

All students eligible to receive the Bachelor of Science in Mathematics are awarded the degree at the same level.

## Honours degree

Students contemplating taking Honours are advised to consult the Honours Coordinator or the Director, Undergraduate Studies, on completing the core of the Bachelor of Science in Mathematics degree.

## Course program

### Full-time program

#### Year 1

##### *Autumn semester*

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

##### *Spring semester*

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

#### Year 2

##### *Autumn semester*

35111	Discrete Mathematics	6cp
35212	Linear Algebra	6cp
35231	Differential Equations	6cp
35232	Advanced Calculus	6cp
	Electives	approx. 6cp

##### *Spring semester*

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

#### Year 3

##### *Autumn semester*

35321	Analysis 1	6cp
	Major 1	6cp
	Major 2	6cp
	Electives	approx. 6cp

##### *Spring semester*

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

### Part-time program

#### Year 1

##### *Autumn semester*

35100	Mathematical Practice	6cp
35140	Operations Research Modelling	6cp

##### *Spring semester*

35101	Mathematics 1	6cp
35151	Statistics 1	6cp

#### Year 2

##### *Autumn semester*

35102	Mathematics 2	6cp
	Electives	approx. 6cp

##### *Spring semester*

35170	Introduction to Computing	6cp
	Electives	approx. 6cp

#### Year 3

##### *Autumn semester*

35111	Discrete Mathematics	6cp
35252	Statistics 2	6cp

##### *Spring semester*

35212	Linear Algebra	6cp
35231	Differential Equations	6cp

#### Year 4

##### *Autumn semester*

35241	Optimisation 1	6cp
	Electives	approx. 6cp

##### *Spring semester*

35232	Advanced Calculus	6cp
	Electives	approx. 6cp

#### Year 5

##### *Autumn semester*

35281	Numerical Analysis 1	6cp
	Major 1	6cp

##### *Spring semester*

35321	Analysis 1	6cp
	Major 2	6cp

#### Year 6

##### *Autumn semester*

	Major 3	6cp
	Electives	approx. 6cp

##### *Spring semester*

	Major 4	6cp
	Electives	approx. 6cp

## Major areas of study

Students must complete at least one of the majors in the areas of Statistics, Operations Research or Mathematics.

### 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 Director, Undergraduate Studies, 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 Year 3 and part-time program Years 5 and 6

##### Autumn semester

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

##### Spring semester

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

#### Applied Mathematics sequence

Full-time program Year 3 and part-time program Years 5 and 6

##### Autumn semester

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

##### Spring semester

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

### Statistics major

#### Full-time program

Year 3

##### Autumn semester

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

##### Spring semester

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

#### Part-time program

Year 5

##### Autumn semester

	Core subject	
35356	Design and Analysis of Experiments	6cp

##### Spring semester

35361	Probability and Stochastic Processes	6cp
	Electives	approx. 6cp

Year 6

##### Autumn semester

35353	Regression Analysis	6cp
	Electives	approx. 6cp

##### Spring semester

35355	Quality Control	6cp
	Electives	approx. 6cp

### Operations Research major

#### Full-time program

Year 3

##### Autumn semester

35342	Optimisation 2	6cp
35363	Simulation Modelling	6cp

##### Spring semester

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

#### Part-time program

Year 5

##### Autumn semester

	Core subject	
35342	Optimisation 2	6cp

##### Spring semester

35361	Probability and Stochastic Processes	6cp
	Electives	approx. 6cp

Year 6

##### Autumn semester

35363	Simulation Modelling	6cp
	Electives	approx. 6cp

##### Spring semester

35340	Operations Research Practice	6cp
	Electives	approx. 6cp

### Electives

Electives occupy 36 credit points of the BSc in Mathematics degree and may be chosen by students to strengthen or develop their knowledge in an area of their choice. Electives are split into **free electives** and **structured electives**.

## 34 School of Mathematical Sciences

### 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 School 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.

Language 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 proscribed by the School are included. The proscribed 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 School.

### 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 BSc in Mathematics degree;
- the Computing sub-major offered by the School of Computing Sciences;
- existing majors or sub-majors within the University, that have been approved by the School as appropriate for use as structured electives;

- 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.

### Computing sub-major

31508	Programming Fundamentals	6cp
31509	Computer Fundamentals	6cp
	<i>and any two of</i>	
31512	Networking 1	6cp
31414	Information Systems	6cp
31424	Systems Modelling	6cp
31434	Database Design	6cp

### Sub-majors offered by other faculties

Students may elect to do a sub-major offered by another faculty. It is necessary to discuss the choice with the Electives Coordinator in the School of Mathematical Sciences, and to obtain appropriate approval from the faculty concerned. The following are possible sub-majors. In all cases, full details are available from the Faculty Office.

#### Aboriginal Studies sub-major

The faculties of Humanities and Social Sciences and Education offer 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. The role of the media and written or spoken communication are the major focuses of these analyses.

015110	Aboriginal Cultures and Philosophies	8cp
54230	Aboriginal Social and Political History	8cp
	<i>plus at least one of</i>	
54231	Aboriginal People and the Media	8cp
54330	The Politics of Aboriginal History	8cp
54331	Aboriginal Forms of Discourse	8cp

#### Finance sub-major

The School of Finance and Economics offers a sub-major in Finance consisting of 34 credit

points. To ensure completion of this sub-major, it is normally necessary to commence it in the Autumn semester of Year 1.

### **Physics sub-majors**

The Department of Applied Physics offers two sub-majors, one in Physics and one in Electronics. Both contain two compulsory subjects. The remaining subjects, with a value totalling eight credit points (or more), must be chosen from a selection of subjects appropriate to the field.

### **International Studies sub-majors**

The Institute for International Studies offers three sub-majors in Specialist Country Studies and Languages Other Than English. Each consists of three 8 credit point subjects.

## **Bachelor of Science (Honours) in Mathematics**

- ◆ *Course code:* MM02
- ◆ *Testamur title:* Bachelor of Science (Honours) in Mathematics
- ◆ *Abbreviation:* BSc(Hons)
- ◆ *Course fee:* HECS

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 BSc in Mathematics degree. The Honours degree is offered over one year on a full-time basis, or two years on a part-time basis, and 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 will accordingly be 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 will depend on the interests of students, and the interests and availability of staff. Students should consult the Honours Coordinator, who will assist them in planning their program. This is of particular importance for part-time students since few subjects will be offered at night.

Admission to the Honours degree will be assessed individually according to the following criteria:

- Students who are eligible to graduate from the BSc in Mathematics degree with an average mark of 65 or more in Year 2 (full-time) of the core and in their chosen major, will be eligible for entry to the Honours degree.
- Students who have obtained qualifications equivalent to the BSc in Mathematics degree will, upon application, be considered for entry by the Head of the School of Mathematical Sciences, on the basis of assessed potential to complete the Honours degree.

The Honours program will require the completion of subjects worth 48 credit points in one year of full-time study, or two years of part-time study. Honours will be offered in the Mathematics, Statistics and Operations Research strands, although some strands may not be offered in a given year. The program will consist of eight coursework subjects, each of four credit points, and a thesis of 16 credit points.

Students contemplating taking Honours are advised to consult the Honours Coordinator or the Director, Undergraduate Studies, on completing the core of the BSc in Mathematics degree. This will enable 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 BSc 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 BSc in Mathematics.

The Honours degree consists of:

- 24 credit points of Honours-level mathematics subjects (numbered as 354xx). These consist of six four-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 will be 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) in the first semester of their program. Part-time students must enrol in this subject at the beginning of their second year.
- Eight 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 will be responsible for designing and administering these subjects. In certain circumstances, these subjects may be replaced by Honours Seminar subjects.

Subjects offered in the various strands are as follows.

#### Mathematics strand

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

#### Operations Research strand

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 strand

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

Each strand is augmented by two seminar subjects, 35491 Honours Seminar A and 35492 Honours Seminar B. These Seminar subjects will be offered either by a visitor to the School, or by members of the School's staff in some particular area of interest at the time.

These strands may be amended as areas of significance and interest in the School change with time.

#### Grading of awards

The assessment of students' results will take into account the Honours level coursework subjects, the thesis and the seminar. Honours at the grades of First Class, Second Class (Division 1), Second Class (Division 2) and Third Class will be awarded for the successful completion of the course.

## Bachelor of Science in Mathematics/Bachelor of Arts in International Studies

- ♦ *Course code: MM05*
- ♦ *Testamur title: Bachelor of Science in Mathematics*  
*Bachelor of Arts in International Studies*
- ♦ *Abbreviation: BSc BA*
- ♦ *Course fee: HECS*

This course combines the Bachelor of Science in Mathematics with the University's 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. Owing to timetabling constraints, the combined degree is only offered on a full-time basis over five years.

### Studies in Mathematical Sciences

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 strands in Statistics, Operations Research and Mathematics), requiring an additional year of full-time study, is also available.

### International Studies

The Bachelor of Arts in International Studies is designed to increase awareness and understanding of the non-English-speaking world.

Students take one of the following majors in the International Studies program: Argentina, Australia and the Asia-Pacific Region, Chile, China, France, Germany, Greece, Indonesia, Italy, Japan, Malaysia, Mexico, Russia, South China, Spain, Taiwan, Thailand and Vietnam. They study an appropriate language and

culture; learn about the contemporary society of their country of specialisation; and then spend an academic year of study at a university in their country of specialisation. The costs of tuition and travel are borne by UTS. In many cases, there will be no additional costs for students. However, those studying in countries or regions where the cost of living is high – notably Japan, Argentina, Hong Kong and Taiwan – should be prepared to pay additional costs for accommodation and maintenance.

### Course structure

The structure of the five-year course in Mathematical Sciences and International Studies 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.

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 Bachelor of Arts in International Studies requires undergraduates to study a major – a region or country of specialisation – over a minimum of three years. Students study language and culture for at least two years in Sydney, and this is followed by a period of study overseas.

Each of the specialisations within the International Studies program is 96 credit points, and includes 32 credit points (four subjects) of instruction in an appropriate Language and Culture; 16 credit points (two subjects) of the study of Contemporary Society and its context; and 48 credit points (two semesters) of study at a university or institution of higher education in the country or region of specialisation.

The International Studies subjects listed in the course program are subjects of enrolment referring to common units of instruction across the University.

### Language and Culture

The study of Language and Culture at UTS depends on the individual student's level of language proficiency before entry to the UTS program. There is a range of entry levels to the various Language and Culture programs available. Most are available at beginners' and post-HSC levels, and some at more advanced levels.

The Institute for International Studies offers Language and Culture programs in Cantonese, Chinese, Indonesian, Japanese, Malaysian and Spanish on UTS campuses through arrangements with the Insearch Language Centre. Higher levels of these languages may be offered through arrangements with other universities in the Sydney area.

French, German, Greek, Italian, Russian and Thai are offered to UTS students through arrangements that have been made with other Sydney universities.

### Contemporary Society

For each specialisation in the International Studies program, students have a prescribed pair of units of instruction in Contemporary Society, taught by the Institute for International Studies in cooperation with the Faculty of Humanities and Social Sciences.

The first is Comparative Social Change, which is a subject that provides a general introduction to comparative social and political change. It is designed to locate further study of the major in its intellectual and physical contexts.

The second is a subject that provides a more detailed introduction to the area of specialisation, and which is specific for each major:

<i>Major</i>	<i>Contemporary Society subject</i>
Argentina	Contemporary Latin America
Chile	Contemporary Latin America
China	Contemporary China
France	Contemporary Europe
Germany	Contemporary Europe
Greece	Contemporary Europe
Indonesia	Contemporary South-East Asia
Italy	Contemporary Europe
Japan	Contemporary Japan
Malaysia	Contemporary South-East Asia
Mexico	Contemporary Latin America
Russia	Contemporary Europe
South China	Chinese East Asia
Spain	Contemporary Europe
Taiwan	Chinese East Asia
Thailand	Contemporary South-East Asia
Vietnam	Contemporary South-East Asia

### In-country Study

Arrangements for students to spend two semesters of study at an institution of higher education in the country or region of specialisation are made by the Institute for International Studies. The first semester will largely be concerned with further language development and cultural appreciation. The second semester will continue the study of language and culture but, where possible, will attempt to direct study towards subjects related to the mathematical sciences. Where students have reached an appropriate level of language competence, arrangements may be made to substitute one or two semesters of industrial experience for periods of In-country Study. In-country industrial experience undertaken in this way will be assessed by UTS in a manner similar to subjects of In-country Study, though through cooperation between the Institute for International Studies and the School of Mathematical Sciences.

### Course program

#### Year 1

##### Autumn semester

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

##### Spring semester

35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp
	Elective	12cp

#### Year 2

##### Autumn semester

35212	Linear Algebra	6cp
35231	Differential Equations	6cp
971xxx	Language and Culture 1	8cp

##### Spring semester

35241	Optimisation 1	6cp
35252	Statistics 2	6cp
35281	Numerical Analysis 1	6cp
972xxx	Language and Culture 2	8cp

#### Year 3

##### Autumn semester

35111	Discrete Mathematics	3cp
50140	Comparative Social Change	8cp
973xxx	Language and Culture 3	8cp
	Elective	6cp

### Spring semester

35232	Advanced Calculus	6cp
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

35321	Analysis 1	6cp
353xx	Mathematics Major 1	6cp
353xx	Mathematics Major 2	6cp
	Elective	12cp

##### Spring semester

353xx	Mathematics Major 3	6cp
353xx	Mathematics Major 4	6cp
	Elective	12cp

### Majors

The program for each of the majors corresponds precisely with that in the Bachelor of Science in Mathematics.

### Arrangements for In-country Study

In general, students may expect that no additional costs will be incurred through following a period of In-country Study as part of this degree program. The two semesters of In-country Study are full-credit subjects at UTS for which HECS is payable. There are, however, no further tuition fees and the Institute for International Studies will provide travel subsidies. Students in receipt of Austudy in Australia are also able to receive it while they are engaged in In-country Study.

Some of the countries targeted in the International Studies program are relatively 'high-cost'. Though the Institute for International Studies will assist students enrolled in a period of In-country Study in one of those countries with their costs, it cannot guarantee to meet all additional costs. In such cases, students need to be prepared to shoulder a proportion of the costs themselves. Japan is the most obvious case in point.

Under normal circumstances, students can only proceed to a period of In-country Study within the International Studies program if they have successfully completed all earlier stages in the degree program. Students who have not successfully completed all earlier

stages may only proceed to a period of In-country Study under exceptional circumstances and with the permission of both the Dean of the Faculty and the Director of the Institute for International Studies.

Before students leave UTS to engage in a period of In-country Study within the International Studies program, they may be required to meet appropriate financial and enrolment requirements by the Director of the Institute for International Studies. They will also be required to agree to be governed by the Institute's code of good conduct during their period of In-country Study.

## Bachelor of Mathematics and Finance

- ◆ *Course code: MM03*
- ◆ *Testamur title: Bachelor of Mathematics and Finance*
- ◆ *Abbreviation: BMathFin*
- ◆ *Course fee: HECS*

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 a new type of graduate trained in both mathematics and finance.

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

Students graduating from the BMathFin will have undertaken an integrated sequence of subjects in mathematics, statistics, finance, economics, accounting, business law 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.

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

course over six years. In the first four years of the course, part-time students will be 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 will be arranged individually for part-time students to spread the eight subjects of Year 3 of the full-time course over two years.

### Grading of awards

All students eligible to receive the Bachelor of Mathematics and Finance are awarded the degree at the same level.

### Course program

#### Full-time program

##### Year 1

##### *Autumn semester*

22105	Accounting A	4cp
25110	Microeconomics	4cp
25308	Financial Markets	4cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp

##### *Spring semester*

25209	Macroeconomics	4cp
25314	Business Finance	4cp
35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp
79202	Business Law	4cp

##### Year 2

##### *Autumn semester*

35111	Discrete Mathematics	6cp
35212	Linear Algebra	6cp
35231	Differential Equations	6cp
35170	Introduction to Computing	6cp

##### *Spring semester*

25905	Capital Budgeting and Valuation (Honours)	6cp
25906	Investment Analysis (Honours)	6cp
35252	Statistics 2	6cp
35281	Numerical Analysis 1	6cp

##### Year 3

##### *Autumn semester*

25621	Financing Decisions and Capital Market Theory	6cp
35321	Analysis 1	6cp
35353	Regression Analysis	6cp
25620	Derivative Securities	6cp

or

25210	Microeconomic Theory and Policy	6cp
-------	---------------------------------	-----

**Spring semester**

25421	International Financial Management	6cp
25606	Financial Time Series Analysis	6cp
35361	Probability and Stochastic Processes	6cp
35241	Optimisation 1	6cp
	<i>or</i>	
35322	Analysis 2	6cp

Students not intending to proceed to Honours must take the subjects 25620 Derivative Securities and 35241 Optimisation 1 in their Year 3 program. Students intending to undertake the Honours degree must include 25210 Microeconomic Theory and Policy and 35322 Analysis 2 in their Year 3 program.

**Part-time program****Year 1****Autumn semester**

22105	Accounting A	4cp
25110	Microeconomics	4cp
35140	Operations Research Modelling	6cp

**Spring semester**

35101	Mathematics 1	6cp
35151	Statistics 1	6cp

**Year 2****Autumn semester**

25308	Financial Markets	4cp
35102	Mathematics 2	6cp

**Spring semester**

25209	Macroeconomics	4cp
25314	Business Finance	4cp

**Year 3****Autumn semester**

35111	Discrete Mathematics	6cp
35252	Statistics 2	6cp

**Spring semester**

25906	Investment Analysis (Honours)	6cp
35212	Linear Algebra	6cp

**Year 4****Autumn semester**

35281	Numerical Analysis 1	6cp
79202	Business Law	4cp

**Spring semester**

25905	Capital Budgeting and Valuation (Honours)	6cp
35231	Differential Equations	6cp

**Year 5****Autumn semester**

25421	International Financial Management	6cp
25621	Financing Decisions and Capital Market Theory	6cp

**Spring semester**

35321	Analysis 1	6cp
35353	Regression Analysis	6cp

**Year 6****Autumn semester**

25620	Derivative Securities	6cp
	<i>or</i>	
25210	Microeconomic Theory and Policy	6cp
35361	Probability and Stochastic Processes	6cp

**Spring semester**

25606	Financial Time Series Analysis	6cp
35241	Optimisation 1	6cp
	<i>or</i>	
35322	Analysis 2	6cp

Students not intending to proceed to Honours must take the subjects 25620 Derivative Securities and 35241 Optimisation 1 in their Year 6 program. Students intending to undertake the Honours degree must include 25210 Microeconomic Theory and Policy and 35322 Analysis 2 in their Year 6 program.

## Bachelor of Mathematics and Finance (Honours)

- ◆ *Course code: MM04*
- ◆ *Testamur title: Bachelor of Mathematics and Finance (Honours)*
- ◆ *Abbreviation: BMathFin(Hons)*
- ◆ *Course fee: HECS*

The Bachelor of Mathematics and Finance degree (Honours) requires an additional year of advanced study. Honours degree graduates will be particularly sought after and their additional skills will 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 to the Honours degree will be assessed individually according to the following criteria:

- Students who are eligible to graduate from the BMathFin degree at UTS with an average mark of 65 or more over all subjects in Years 2 and 3 (full-time) will be eligible for entry to the Honours degree,

subject to the approval of the Heads of the Schools of Mathematical Sciences and Finance and Economics.

- Students who have obtained qualifications equivalent to the BMathFin degree will be considered for entry, upon application, by the Heads of the two participating Schools on the basis of their assessed potential to complete the Honours degree.

The Honours degree will require completion of subjects worth 48 credit points over one year of full-time study. The year consists of coursework subjects of an advanced nature in mathematics, statistics and finance, together with a substantial project. The project will involve a major investigation of some area of finance, and will provide students with the opportunity to apply the skills developed in their coursework. The project will be assessed on the basis of a thesis and a seminar presented to the staff of both Schools.

### Grading of awards

The assessment of students' results will take into account the Honours level coursework subjects, the thesis and the seminar. Honours at the grades of First Class, Second Class (Division 1), Second Class (Division 2) and Third Class will be awarded for the successful completion of the course.

### Course program

Listed below is the course program for the BMathFin(Hons) degree.

Year 4

#### Autumn semester

25907	Theory of Financial Decision Making	6cp
35438	Nonlinear Dynamical Systems	4cp
35457	Multivariate Statistics	4cp
35466	Advanced Stochastic Processes	4cp
35486	Optimal Control 1	4cp

#### Spring semester

25908	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.

## Bachelor of Mathematics and Finance/Bachelor of Arts in International Studies

- ♦ *Course code:* MM06
- ♦ *Testamur title:* Bachelor of Mathematics and Finance  
Bachelor of Arts in International Studies
- ♦ *Abbreviation:* BMathFin BA
- ♦ *Course fee:* HECS

This course combines the Bachelor of Mathematics and Finance with the University's 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. Because of timetabling constraints, the combined degree is available only on a full-time basis over five years.

### Studies in Mathematics and Finance

Students graduating from this degree will have undertaken an integrated sequence of study in mathematics, statistics, finance, economics, accounting, business law 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.

For further information, see the course outline for the Bachelor of Mathematics and Finance in this handbook.

The Mathematics and Finance components of the course occupy 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.

### International Studies

The Bachelor of Arts in International Studies is designed to increase awareness and understanding of the non-English-speaking world.

Students take one of the following majors in the International Studies program: Argentina, Australia and the Asia-Pacific Region, Chile, China, France, Germany, Greece, Indonesia, Italy, Japan, Malaysia, Mexico, South China,

Spain, Taiwan, Thailand and Vietnam. They study an appropriate language and culture; learn about the contemporary society of their country of specialisation; and then spend an academic year of study at a university in their country of specialisation. The costs of tuition and travel are borne by UTS. In many cases, there will be no additional costs for students. However, those studying in countries or regions where the cost of living is high – notably Japan, Argentina, Hong Kong and Taiwan – should be prepared to pay additional costs for accommodation and maintenance.

### Course structure

The structure of the five-year course in Mathematics and Finance and International Studies 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 program.

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.

The Mathematics and Finance components of the course include an integrated sequence of subjects in mathematics, statistics, finance, economics, accounting, business law and computing.

The Bachelor of Arts in International Studies requires undergraduates to study a major – a region or country of specialisation – over a minimum of three years. Students study language and culture for at least two years in Sydney, and this is followed by a period of study overseas.

Each of the specialisations within the International Studies program is 96 credit points, and includes 32 credit points (four subjects) of instruction in an appropriate Language and Culture; 16 credit points (two subjects) of the study of Contemporary Society and its context; and 48 credit points (two semesters) of study at a university or institution of higher education in the country or region of specialisation.

The International Studies subjects listed in the course program are subjects of enrolment referring to common units of instruction across the University.

### Language and Culture

The study of Language and Culture at UTS depends on the individual student's level of language proficiency before entry to the UTS program. There is a range of entry levels to the various Language and Culture programs available. Most are available at beginners' and post-HSC levels, and some at more advanced levels.

The Institute for International Studies offers Language and Culture programs in Cantonese, Chinese, Indonesian, Japanese, Malaysian and Spanish on UTS campuses through arrangements with the Insearch Language Centre. Higher levels of these languages may be offered through arrangements with other universities in the Sydney area.

French, German, Greek, Italian, Russian and Thai are offered to UTS students through arrangements that have been made with other Sydney universities.

### Contemporary Society

For each specialisation in the International Studies program, students have a prescribed pair of units of instruction in Contemporary Society, taught by the Institute for International Studies in cooperation with the Faculty of Humanities and Social Sciences.

The first is Comparative Social Change, which is a subject that provides a general introduction to comparative social and political change. It is designed to locate further study of the major in its intellectual and physical contexts.

The second is a subject that provides a more detailed introduction to the area of specialisation, and which is specific for each major:

<i>Major</i>	<i>Contemporary Society subject</i>
Argentina	Contemporary Latin America
Chile	Contemporary Latin America
China	Contemporary China
France	Contemporary Europe
Germany	Contemporary Europe
Greece	Contemporary Europe
Indonesia	Contemporary South-East Asia
Italy	Contemporary Europe
Japan	Contemporary Japan
Malaysia	Contemporary South-East Asia
Mexico	Contemporary Latin America
Russia	Contemporary Europe
South China	Chinese East Asia
Spain	Contemporary Europe
Taiwan	Chinese East Asia
Thailand	Contemporary South-East Asia
Vietnam	Contemporary South-East Asia

## In-country Study

Arrangements for students to spend two semesters of study at an institution of higher education in the country or region of specialisation are made by the Institute for International Studies. The first semester will largely be concerned with further language development and cultural appreciation. The second semester will continue the study of language and culture but, where possible, will attempt to direct study towards subjects related to mathematics and finance. Where students have reached an appropriate level of language competence, arrangements may be made to substitute one or two semesters of industrial experience for periods of In-country Study. In-country industrial experience undertaken in this way will be assessed by UTS in a manner similar to subjects of In-country Study, though through cooperation between the Institute for International Studies and the School of Mathematical Sciences.

### Course program

#### Year 1

##### Autumn semester

22105	Accounting A	4cp
25110	Microeconomics	4cp
25308	Financial Markets	4cp
35101	Mathematics 1	6cp
35151	Statistics 1	6cp

##### Spring semester

25209	Macroeconomics	4cp
25314	Business Finance	4cp
79202	Business Law	4cp
35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp

#### Year 2

##### Autumn semester

35170	Introduction to Computing	6cp
35212	Linear Algebra	6cp
35231	Differential Equations	6cp
971xxx	Language and Culture 1	8cp

##### Spring semester

25905	Capital Budgeting and Valuation (Honours)	6cp
35252	Statistics 2	6cp
35281	Numerical Analysis 1	6cp
972xxx	Language and Culture 2	8cp

#### Year 3

##### Autumn semester

35111	Discrete Mathematics	6cp
50140	Comparative Social Change	8cp
973xxx	Language and Culture 3	8cp

##### Spring semester

25906	Investment Analysis (Honours)	6cp
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

25620	Derivative Securities	6cp
25621	Financing Decisions and Capital Market Theory	6cp
35321	Analysis 1	6cp
35353	Regression Analysis	6cp

##### Spring semester

25421	International Financial Management	6cp
25606	Financial Time Series Analysis	6cp
35241	Optimisation 1	6cp
35361	Probability and Stochastic Processes	6cp

**Note:** Students intending to proceed to the Honours degree in Mathematics and Finance should substitute 25210 Microeconomic Theory and Policy for the subject 25620 Derivative Securities and 35322 Analysis 2 for the subject 35241 Optimisation 1 in their final year.

## Arrangements for In-country Study

In general, students may expect that no additional costs will be incurred through following a period of In-country Study as part of this degree program. The two semesters of In-country Study are full-credit subjects at UTS for which HECS is payable. There are, however, no further tuition fees and the Institute for International Studies will provide travel subsidies. Students in receipt of Austudy in Australia are also able to receive it while they are engaged in In-country Study.

Some of the countries targeted in the International Studies program are relatively 'high-cost'. Though the Institute for International Studies will assist students enrolled in a period of In-country Study in one of those countries with their costs, it cannot guarantee to meet all additional costs. In such cases,

students need to be prepared to shoulder a proportion of the costs themselves. Japan is the most obvious case in point.

Under normal circumstances, students can only proceed to a period of In-country Study within the International Studies program if they have successfully completed all earlier stages in the degree program. Students who have not successfully completed all earlier stages may only proceed to a period of In-country Study under exceptional circumstances and with the permission of both the Dean of the Faculty and the Director of the Institute for International Studies.

Before students leave UTS to engage in a period of In-country Study within the International Studies program they may be required to meet appropriate financial and enrolment requirements by the Director of the Institute for International Studies. They will also be required to agree to be governed by the Institute's code of good conduct during their period of In-country study.

## Bachelor of Mathematics and Computing

- ◆ *Course code:* MM07
- ◆ *Testamur title:* Bachelor of Mathematics and Computing
- ◆ *Abbreviation:* BMathComp
- ◆ *Course fee:* HECS

The increasing dependence of society on information technology has brought with it an increasing requirement for graduates with both computational and analytical 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 will be well qualified to fill this role.

The Bachelor of Mathematics and Computing is offered as a Pass degree requiring completion of subjects with a total value of 144 credit points. Students who graduate from the course at a sufficiently high standard will be eligible to enter either the Bachelor of Science

(Honours) in Computing Science course or the Bachelor of Science (Honours) in Mathematics course.

The degree is offered as a full-time course over three years and as a part-time course over six years. The core of the course consists of an integrated sequence of subjects in mathematics, statistics, operations research, computer and systems architecture, programming and information systems analysis and design.

### Elective subjects

By choosing appropriate elective subjects in the final year of the full-time course, or years 5 and 6 of the part-time course, students have an opportunity to further develop their understanding of areas in which they are interested. Three elective subjects must be undertaken in an area of the mathematical sciences and one in an area of computing science. The computing elective is normally chosen from subjects offered at the third year (full-time) level of the Bachelor of Science in Computing Science course, and is subject to the approval of the Electives Coordinator. The mathematics electives must consist of one of two approved sequences drawn from the Statistics major and the Operations Research major of the Bachelor of Science in Mathematics course.

These sequences are:

#### Statistics sequence:

- 35353 Regression Analysis
- 35356 Design and Analysis of Experiments
- 35361 Probability and Stochastic Processes

#### Operations Research sequence:

- 35340 Operations Research Practice
- 35342 Optimisation 2
- 35363 Simulation Modelling

The following sequence is currently under consideration, and would be well-suited for teachers of mathematics and computing.

#### Mathematics sequence:

- 35231 Differential Equations
- 35232 Advanced Calculus
- 35321 Analysis 1

### Grading of awards

All students eligible to receive the Bachelor of Mathematics and Computing are awarded the degree at the same level.

## Course program

### Full-time program

#### Year 1

##### *Autumn semester*

31415	Principles of Software Development A	6cp
31416	Computer Systems Architecture	6cp
31417	Computing Practice	6cp
35101	Mathematics 1	6cp

##### *Spring semester*

31425	Principles of Software Development B	6cp
31429	Procedural Programming	6cp
35102	Mathematics 2	6cp
35140	Operations Research Modelling	6cp

#### Year 2

##### *Autumn semester*

31436	Systems Software and Networks	8cp
35110	Discrete Mathematics (S)	4cp
35151	Statistics 1	6cp
35212	Linear Algebra	6cp

##### *Spring semester*

31424	Systems Modelling	6cp
35241	Optimisation 1	6cp
35252	Statistics 2	6cp
35290	Group Project	6cp

#### Year 3

##### *Autumn semester*

31434	Database Design	6cp
31455	Software Development Case Study	12cp
	Mathematics Elective 1	6cp
	Mathematics Elective 2	6cp

##### *Spring semester*

31455	Software Development Case Study (continued)	
35281	Numerical Analysis 1	6cp
	Mathematics Elective 3	6cp
	Computing Elective	6cp

### Part-time program

#### Year 1

##### *Autumn semester*

31416	Computer Systems Architecture	6cp
31417	Computing Practice	6cp

##### *Spring semester*

31415	Principles of Software Development A	6cp
35101	Mathematics 1	6cp

#### Year 2

##### *Autumn semester*

31425	Principles of Software Development B	6cp
35140	Operations Research Modelling	6cp

##### *Spring semester*

31429	Procedural Programming	6cp
35151	Statistics 1	6cp

#### Year 3

##### *Autumn semester*

35102	Mathematics 2	6cp
35110	Discrete Mathematics (S)	4cp

##### *Spring semester*

31436	Systems Software and Networks	8cp
35212	Linear Algebra	6cp

#### Year 4

##### *Autumn semester*

35241	Optimisation 1	6cp
35252	Statistics 2	6cp

##### *Spring semester*

31424	Systems Modelling	6cp
35290	Group Project	6cp

#### Year 5

##### *Autumn semester*

31434	Database Design	6cp
35281	Numerical Analysis 1	6cp

##### *Spring semester*

	Computing Elective	6cp
	Mathematics Elective 1	6cp

#### Year 6

##### *Autumn semester*

31455	Software Development Case Study	12cp
	Mathematics Elective 2	6cp

##### *Spring semester*

31455	Software Development Case Study (continued)	
	Mathematics Elective 3	6cp

# POSTGRADUATE COURSES

## POSTGRADUATE RESEARCH DEGREES

The Master of Science (by thesis) (MSc) and Doctor of Philosophy (PhD) degrees provide the opportunity for graduates to extend and deepen their knowledge in specialised areas of mathematics by undertaking research under the supervision of a member of academic staff.

The main interests within the School of Mathematical Sciences are in applied and computational mathematics, operations research and statistics. Particular interests and specialisations exist in the following areas:

### Computational Mathematics and Computing

Lattice rules for numerical multiple integration; quasi-Monte Carlo methods.

### Differential Geometry

Topology and Ricci curvature; and integral formulas on submanifolds of a Riemannian manifold.

### Electromagnetic Diffraction Theory

Diffraction properties of one-dimensional and two-dimensional periodic structures; optics of thin films; theory of composite materials; and electromagnetic localisation in random media.

### Geophysical Applications of Mathematics

Seismic ray theory for slightly heterogeneous structures; properties of normal rays; seismic wave propagation; seismic velocity inversion; inverse problems; and radio frequency propagation in coal seams.

### Mathematics Education

Mathematical education of engineers; tertiary education in applied mathematics; and statistical education.

### Mathematical Finance

Financial mathematics; stochastic analysis; numerics of stochastic differential equations; and modelling in economics and finance.

### Number Theory

Recurring sequences; odd perfect numbers and related numbers; and arithmetical functions.

### Operations Research

Simulation techniques; scheduling; discrete optimisation; neural networks; and finance theory and modelling.

## Statistics

Medical applications of statistics; measurement and test design; permissible statistics; stationary Markov sequences; simulation and density estimation; and applied statistics.

Research projects that are focused on biomedical applications are conducted through the Centre for Biomedical Technology which was formed in 1990. The Centre is an interfaculty network of research and education teams working in the field of biomedical technology. It integrates the University's diverse expertise and resources to enhance the scientific and technological base for biomedical technology research and training for industry, health-care providers and government. Other schools and faculties involved with the Centre are the Faculty of Science, the Faculty of Nursing, Midwifery and Health, the Faculty of Engineering and the School of Computing Sciences.

## Fees

Fees will be levied in accordance with University policies and DETYA guidelines. Details will be available in early 2000.

## Recent theses

### DSc thesis

Shannon, A G 1999, Interdisciplinary contributions to the diagnosis and management of diabetes mellitus.

### PhD theses

Melham, R S 1995, Some aspects of homogeneous linear recursive sequences of order mainly two.

Wong, C-K 1996, Mathematical modelling of peptide kinetics in diabetes mellitus.

Ramadan-Jradi, W A 1998, Some aspects of Carmichael's conjecture.

### MSc theses

Thornton, F 1996, Combining diagnostic modalities to aid breast screening effectiveness.

Wood, J W 1997, Research and development and sensitivity analysis within the input-output model.

## Doctor of Philosophy

---

- ◆ *Course code: MM54*
  - ◆ *Testamur title: Doctor of Philosophy*
  - ◆ *Abbreviation: PhD*
  - ◆ *Course fee: tba*
- 

The Doctor of Philosophy (PhD) program provides an opportunity for graduates to acquire high-level research skills and substantially deepen their knowledge in an area of the mathematical sciences by working under the guidance of a supervisor. The research program entails survey and mastery of a large body of literature in the chosen topic together with a substantial body of high-level original work by the candidate. Students are also required to present seminars during the time of their enrolment and at the completion of their program.

The course is offered in full-time and part-time modes. For full-time enrolments, the normal duration of the program is three years; for part-time enrolments, it is six years. It is expected that part-time students will be able to devote 20 hours per week to work towards the degree. All students are expected to maintain regular contact (at least weekly) with their supervisor.

## Master of Science

---

- ◆ *Course code: MM51*
  - ◆ *Testamur title: Master of Science*
  - ◆ *Abbreviation: MSc*
  - ◆ *Course fee: tba*
- 

The Master of Science (MSc) program provides an opportunity for graduates to acquire research skills and deepen their knowledge in some areas of the mathematical sciences. Students work under the guidance of a supervisor who is a member of the full-time academic staff of the School. The research program entails survey and mastery of a substantial body of literature in the chosen topic together with original work from the candidate. The degree is examined through the presentation of a thesis. Students are also required to present seminars during the time of their enrolment and at the completion of their program.

The course is offered in full-time and part-time modes. For full-time enrolments, the normal duration of the program is two years; for part-time enrolments, it is four years. It is expected that part-time students will be able to devote 20 hours per week to work towards the degree. All students are expected to maintain regular contact (at least weekly) with their supervisor.

## POSTGRADUATE COURSEWORK PROGRAMS

### Master of Science in Operations Research

- 
- ◆ *Course code: MM67*
  - ◆ *Testamur title: Master of Science in Operations Research*
  - ◆ *Abbreviation: MSc*
  - ◆ *Course fee: \$200 per credit point (local students); \$6,000 for each semester (international students)<sup>1</sup>*
- 

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.

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.

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 BSc in Mathematics, or an equivalent course.

---

<sup>1</sup> There are no government-funded student places for this course and it is necessary to charge full fees. Some scholarships may be available for local students in financial need. For further information, please contact the Faculty Office. Course fees are revised every year in accordance with University and government policy.

The course has a requirement of two years germane work experience. Applicants not satisfying the academic prerequisites are advised to consider enrolling in the Graduate Diploma in Operations Research or the Graduate Certificate programs offered by the School. All applicants should discuss their eligibility for entry with the Director, Postgraduate Studies, and must complete an application form which includes a description of prior work experience.

#### Course structure

This is a 48 credit-point subject which consists of two core subjects (each six credit points), 12 credit points of electives and a substantial project of 24 credit points. It is offered full time over two semesters or part time over four semesters. Part-time students should be aware that some daytime attendance may be unavoidable.

Depending on demand, electives may be developed and offered within the School 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 School 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 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.

The project is the main component of the subject 35599 Report, extending over two semesters. Studies for the project will normally be related to the applicant's prior work experience. An oral presentation in the form of a seminar is also required.

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).

## Course program

**The course program consists of the following subjects:**

35545	Further Methods in Operations Research	6cp
35549	Case Studies in Management Science	6cp
35599	Report	24cp
	Electives	12cp

## Graduate Diploma in Applicable Mathematics

- ♦ *Course code: MM67*
- ♦ *Testamur title: Graduate Diploma in Applicable Mathematics*
- ♦ *Abbreviation: GradDipApplicMath*
- ♦ *Course fee: \$200 per credit point (local students); \$5,500 for each semester (international students)<sup>1</sup>*

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. Students will be expected to have a sound background in mathematics and statistics to approximately second-year level.

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, will be available where warranted.

<sup>1</sup> There are no government-funded student places for this course and it is necessary to charge full fees. Some scholarships may be available for local students in financial need. For further information, please contact the Faculty Office. Course fees are revised from year to year in accordance with University and government policy.

The length of the course is 48 credit points, comprising coursework in eight subjects. One of these subjects is an elective that would generally be chosen from one of the major areas (Mathematics, Statistics or Operations Research) in the Bachelor of Science in Mathematics degree. The course is offered full-time over two semesters or part-time over four semesters. Part-time students should be aware that attendance at daytime classes for some subjects may be unavoidable.

Applicants for the Graduate Diploma should discuss their eligibility with the Director, Postgraduate Studies. Those who have not completed the necessary prerequisites will be required to enrol in appropriate subjects, either as non-award students or in a Graduate Certificate program.

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).

## 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
	Elective	6cp

## Graduate Diploma in Mathematics and Finance

- ◆ *Course code: MM66*
- ◆ *Testamur title: Graduate Diploma in Mathematics and Finance*
- ◆ *Abbreviation: GradDipMathFin*
- ◆ *Course fee: \$200 per credit point (local students); \$5,500 for each semester (international students)<sup>1</sup>*

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. Students will be expected to have a sound background in mathematics and statistics to first-year level.

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, will be available where warranted.

The length of the course is 48 credit points, comprising coursework in eight subjects, one of which is an elective subject. The course is offered full-time over three semesters or part-time over four semesters. Part-time students should be aware that attendance at daytime classes for some subjects may be unavoidable.

Applicants for the Graduate Diploma should discuss their eligibility with the Director, Postgraduate Studies. Those who have not completed the necessary prerequisites will be required to enrol in appropriate subjects, either as non-award students or in a Graduate Certificate program.

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).

<sup>1</sup> There are no government-funded student places for this course and it is necessary to charge full fees. Some scholarships may be available for local students in financial need. For further information, please contact the Faculty Office. Course fees are revised from year to year in accordance with University and government policy.

## Course program

*The course 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
	Elective	4cp

## Graduate Diploma in Operations Research

- ◆ *Course code: MM52*
- ◆ *Testamur title: Graduate Diploma in Operations Research*
- ◆ *Abbreviation: GradDipOR*
- ◆ *Course fee: \$200 per credit point (local students); \$5,500 for each semester (international students)<sup>1</sup>*

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 in mathematics, statistics and computing to approximately first-year level. It 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.

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.

<sup>1</sup> There are no government-funded student places for this course and it is necessary to charge full fees. Some scholarships may be available for local students in financial need. For further information, please contact the Faculty Office. Course fees are revised from year to year in accordance with University and government policy.

The length of the course is 48 credit points, comprising coursework in eight subjects, two of which are elective subjects. These may be combined into a single 12-credit-point project taken over two semesters. The course is offered full-time over two semesters or part-time over four semesters. For part-time students, attendance at daytime classes for some subjects may be unavoidable.

Applicants for the Graduate Diploma program should discuss their eligibility with the Director, Postgraduate Studies.

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).

## Course program

***The course 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
	Electives	12cp

## Graduate Diploma in Statistics

- ♦ *Course code: MM65*
- ♦ *Testamur title: Graduate Diploma in Statistics*
- ♦ *Abbreviation: GradDipStats*
- ♦ *Course fee: \$200 per credit point (local students); \$5,500 for each semester (international students)<sup>1</sup>*

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 BSc in Mathematics degree with the Statistics major. Students will be expected to have some statistical and mathematical background.

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.

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.

The length of the course is 48 credit points, comprising coursework in eight subjects, three of which are elective subjects. 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.

The course is offered full time over two semesters or part time over four semesters. Part-time students should be aware that attendance at daytime classes for some subjects may be unavoidable.

<sup>1</sup> There are no government-funded student places for this course and it is necessary to charge full fees. Some scholarships may be available for local students in financial need. For further information, please contact the Faculty Office. Course fees are revised from year to year in accordance with University and government policy.

Applicants for this course will be 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 will be assessed by the Director, Postgraduate Studies, and those who have not completed the necessary prerequisites will be required to enrol in appropriate subjects, either as non-award students or as part of a Graduate Certificate program.

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).

### Course program

*The course 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
	Electives	18cp

## Graduate Certificate in Mathematical Sciences

- ◆ *Course code: MM56*
- ◆ *Testamur title: Graduate Certificate in Mathematical Sciences*
- ◆ *Abbreviation: none*
- ◆ *Course fee: \$200 per credit point<sup>1</sup>*

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.

<sup>1</sup> Full tuition fees will be charged for this course. This fee is subject to annual review.

The course has a flexible structure and the wide range of subjects offered in the other post-graduate and undergraduate courses in the School of Mathematical Sciences is available to intending students. Students may undertake any sequence of subjects offered by the School with a total value of 12 credit points, provided that individual subject prerequisites are satisfied.

Applicants will normally be expected to hold a Bachelor's degree, or higher qualification, from a recognised tertiary institution. Applicants who do not possess such qualifications will be considered on an individual basis. Prior to their admission, all applicants will be required to discuss their preferred program of study with the Graduate Certificate Coordinator in order to ensure that they have the requisite background knowledge for their chosen subject sequences.

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).

### 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 Analysis 1	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 Analysis 1	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

# NUMERICAL LIST OF SUBJECTS

The following table indicates the number and name of each subject, the semester or semesters in which it is offered (these are subject to change), the credit-point value (cp), the number of contact hours (hpw), and the prerequisites and corequisites (indicated by c). The letters A and S refer to Autumn and Spring semesters, respectively, and Y is used for a year-long subject. As a general guide, four contact hours suggests three hours of lectures and one tutorial hour per week, and six contact hours suggests a further two hours of laboratory work per week.

Subject number	Subject name	Semester offered	CP	HPW	Prerequisites
015110	Aboriginal Cultures and Philosophies		8	3	Nil
22105	Accounting A	A,S	4	3	Nil
25110	Microeconomics	A,S	4	3	Nil
25209	Macroeconomics	A,S	4	3	25110
25210	Microeconomic Theory and Policy	A,S	6	4	25110
25308	Financial Markets	A,S	4	3	Nil
25314	Business Finance	A,S	4	3	22105, 35151, 25308 c
25421	International Financial Management	S	6	4	25308, 25314
25606	Financial Time Series Analysis	S	6	4	35232, 35353
25620	Derivative Securities	A	6	4	25906
25621	Financing Decisions and Capital Market Theory	A	6	4	25905
25905	Capital Budgeting and Valuation (Honours)	S	6	4	25308, 25314
25906	Investment Analysis (Honours)	S	6	4	25308, 25314
25907	Theory of Financial Decision Making	A	4	3	By consent
25908	Derivative Security Pricing	S	4	3	By consent
25910	Thesis	Y	12		By consent
31414	Information Systems	A	6	4	Nil
31415	Principles of Software Development A	A,S	6		31417c
31416	Computer Systems Architecture	A,S	6		Nil
31417	Computing Practice	A,S	6		Nil
31424	Systems Modelling	S	6	3	Nil
31425	Principles of Software Development B	A,S	6		31415
31429	Procedural Programming	A,S	6		31415, 31425c
31434	Database Design	A	6	3	31424
31436	Systems Software and Networks	A,S	8		31416, 31425, 31429
31455	Software Development Case Study	Y	12		31436, 35290
31508	Programming Fundamentals	A,S	6		Nil
31509	Computer Fundamentals	A,S	6		Nil
31512	Networking 1	A,S	6		31509, 35170
33401	Introductory Mathematical Methods	A	6	3	Nil
35100	Mathematical Practice	A,S	6	4	Nil
35101	Mathematics 1	A,S	6	6	Nil
35102	Mathematics 2	A,S	6	6	35101, 35140c
35106	Mathematics in Sport	A or S, Summer	6	3	Nil

Subject number	Subject name	Semester offered	CP	HPW	Prerequisites
35110	Discrete Mathematics (S)	A,S	4	3	Nil
35111	Discrete Mathematics	A,S	6	4	Nil
35140	Operations Research Modelling	A,S	6	4	Nil
35151	Statistics 1	A,S	6	6	Nil
35170	Introduction to Computing	A,S	6	7	Nil
35205	History of Mathematics	S	6	4	Nil
35212	Linear Algebra	A,S	6	4	35140
35231	Differential Equations	A,S	6	4	35102
35232	Advanced Calculus	A,S	6	4	35102
35241	Optimisation 1	A,S	6	4	35102, 35140
35252	Statistics 2	A,S	6	4	35102, 35151
35254	Health Statistics	A	6	4	35151
35281	Numerical Analysis 1	A,S	6	4	35170, 35231c
35290	Group Project	S	6	4	35241c, 35252c
35292-6	Project	A,S	2-6	1-4	By arrangement
35313	Pure Mathematics 3A	A	6	4	35231, 35232
35314	Pure Mathematics 3B	S	6	4	35111
35321	Analysis 1	A,S	6	4	35102
35322	Analysis 2	S	6	4	35321, 35212
35333	Applied Mathematics 3A	A	6	4	35232, 35335c
35334	Applied Mathematics 3B	S	6	4	35333, 35335
35335	Mathematical Methods	A	6	4	35231
35340	Operations Research Practice	S	6	4	35241, 35252
35342	Optimisation 2	A	6	4	35241
35344	Network Optimisation	S	6	4	35241
35353	Regression Analysis	A,S	6	4	35252
35355	Quality Control	S	6	4	35252
35356	Design and Analysis of Experiments	S	6	4	35212, 35252
35361	Probability and Stochastic Processes	A,S	6	4	35252
35363	Simulation Modelling	A,S	6	4	35170, 35361c
35382	Numerical Analysis 2	S	6	4	35281
35384	Financial Modelling	A	6	3	35102, 35151
35391	Seminar (Mathematics)	A or S	6	4	By arrangement
35392	Seminar (Operations Research)	A or S	6	4	By arrangement
35393	Seminar (Statistics)	A or S	6	4	By arrangement
35394	Seminar (Computing)	A or S	6	4	By arrangement
35418	Analytic Number Theory	A	4	3	35314, 35232
35419	Advanced Algebra	A	4	3	35314
35427	Functional Analysis	S	4	3	35322
35428	Convexity and Optimisation	A	4	3	35322
35436	Advanced Mathematical Methods	S	4	3	35334
35437	Partial Differential Equations	A	4	3	35335
35438	Nonlinear Dynamical Systems	A	4	3	35231, 35321
35443	Advanced Mathematical Programming	S	4	3	35342
35446	Scheduling Theory	S	4	3	35342, 35447
35447	Discrete Optimisation	A	4	3	35111, 35342
35448	Dynamic Optimisation	A	4	3	35241, 35361, 35447c
35456	Nonlinear Statistical Models	S	4	3	35353
35457	Multivariate Statistics	A	4	3	35353
35458	Loglinear Modelling	S	4	3	35353

## 56 School of Mathematical Sciences

Subject number	Subject name	Semester offered	CP	HPW	Prerequisites
35459	Linear Models and Experimental Design	S	4	3	35353, 35457, 35356
35466	Advanced Stochastic Processes	A	4	3	35322, 35361
35467	Time Series Analysis	A	4	3	35361
35469	Statistical Consulting	S	4	3	See subject description
35485	Advanced Financial Modelling	A	4	3	35340
35486	Optimal Control 1	A	4	3	35231, 35232
35487	Optimal Control 2	S	4	3	35466, 35486
35491	Honours Seminar A	A or S	4	3	By consent
35492	Honours Seminar B	A or S	4	3	By consent
35496	Thesis Seminar A	A	4	3	By consent
35497	Thesis Seminar B	S	4	3	By consent
35498	Thesis (Honours)	Y	16		By consent
35542	Applied Mathematical Programming		6	4	By consent
35544	Network Modelling		6	4	By consent
35545	Further Methods in Operations Research	A	6	4	35151, 35342
35549	Case Studies in Management Science	S	6	4	35340, 35342, 35363
35563	Applied Simulation Modelling		6	4	By consent
35592-6	Project (Postgraduate)	A or S	4-12		By arrangement
35599	Report (Postgraduate)	Y	24		By consent
50140	Comparative Social Change	A,S	8	4	Nil
54230	Aboriginal Social and Political History		8	3	Nil
54231	Aboriginal People and the Media		8	3	015110, 54230
54330	The Politics of Aboriginal History		8	3	See subject description
54331	Aboriginal Forms of Discourse		8	3	See subject description
79202	Business Law	A,S	4	3	Nil
97x111	Chinese Language and Culture	A or S	8		See subject descriptions
97x121	Cantonese Language and Culture	A or S	8		See subject descriptions
97x211	Japanese Language and Culture	A or S	8		See subject descriptions
97x311	Indonesian Language and Culture	A or S	8		See subject descriptions
97x320	Thai		8		See subject descriptions
97x331	Malaysian Language and Culture	A or S	8		See subject descriptions
97x414/5	French Language and Culture		8		See subject descriptions
97x424/5	German Language and Culture		8		See subject descriptions
97x434/5	Italian Language and Culture		8		See subject descriptions
97x501	Spanish Language and Culture	A or S	8		See subject descriptions
97x710	Greek		8		See subject descriptions
97x734	Russian		8		See subject descriptions
976101	Chinese East Asia	S	8		Nil
976111	Contemporary China	S	8		Nil
976211	Contemporary Japan	S	8		Nil
976301	Contemporary South-East Asia	S	8		Nil
976401	Contemporary Europe	S	8		Nil
976501	Contemporary Latin America	S	8		Nil
977xxx	In-country Study 1		24		See subject descriptions
978xxx	In-country Study 2		24		See subject descriptions

Note: In the case of International Studies subjects, x indicates one of four levels of study.

# ALPHABETICAL LIST OF SUBJECTS

Aboriginal Cultures and Philosophies	015110	Further Methods in Operations Research	35545
Aboriginal Forms of Discourse	54331	German Language and Culture	97x424/5
Aboriginal People and the Media	54231	Greek	97x710
Aboriginal Social and Political History	54230	Group Project	35290
Accounting A	22105	Health Statistics	35254
Advanced Algebra	35419	History of Mathematics	35205
Advanced Calculus	35232	Honours Seminar A	35491
Advanced Financial Modelling	35485	Honours Seminar B	35492
Advanced Mathematical Methods	35436	In-country Study 1	977xxx
Advanced Mathematical Programming	35443	In-country Study 2	978xxx
Advanced Stochastic Processes	35466	Indonesian Language and Culture	97x311
Analysis 1	35321	Information Systems	31414
Analysis 2	35322	International Financial Management	25421
Analytic Number Theory	35418	Introduction to Computing	35170
Applied Mathematical Programming	35542	Introductory Mathematical Methods	33401
Applied Mathematics 3A	35333	Investment Analysis (Honours)	25906
Applied Mathematics 3B	35334	Italian Language and Culture	97x434/5
Applied Simulation Modelling	35563	Japanese Language and Culture	97x211
Business Finance	25314	Linear Algebra	35212
Business Law	79202	Linear Models and Experimental Design	35459
Cantonese Language and Culture	97x121	Loglinear Modelling	35458
Capital Budgeting and Valuation (Honours)	25905	Macroeconomics	25209
Case Studies in Management Science	35549	Malaysian Language and Culture	97x331
Chinese East Asia	976101	Mathematical Methods	35335
Chinese Language and Culture	97x111	Mathematical Practice	35100
Comparative Social Change	50140	Mathematics 1	35101
Computer Fundamentals	31509	Mathematics 2	35102
Computer Systems Architecture	31416	Mathematics in Sport	35106
Computing Practice	31417	Microeconomic Theory and Policy	25210
Contemporary China	976111	Microeconomics	25110
Contemporary Europe	976401	Multivariate Statistics	35457
Contemporary Japan	976211	Network Modelling	35544
Contemporary Latin America	976501	Network Optimisation	35344
Contemporary South-East Asia	976301	Networking 1	31512
Convexity and Optimisation	35428	Nonlinear Dynamical Systems	35438
Database Design	31434	Nonlinear Statistical Models	35456
Derivative Securities	25620	Numerical Analysis 1	35281
Derivative Security Pricing	25908	Numerical Analysis 2	35382
Design and Analysis of Experiments	35356	Operations Research Modelling	35140
Differential Equations	35231	Operations Research Practice	35340
Discrete Mathematics	35111	Optimal Control 1	35486
Discrete Mathematics (S)	35110	Optimal Control 2	35487
Discrete Optimisation	35447	Optimisation 1	35241
Dynamic Optimisation	35448	Optimisation 2	35342
Financial Markets	25308	Partial Differential Equations	35437
Financial Modelling	35384	Politics of Aboriginal History, The	54330
Financial Time Series Analysis	25606	Principles of Software Development A	31415
Financing Decisions and Capital		Principles of Software Development B	31425
Market Theory	25621	Probability and Stochastic Processes	35361
French Language and Culture	97x414/5	Procedural Programming	31429
Functional Analysis	35427	Programming Fundamentals	31508

## 58 School of Mathematical Sciences

Project	35292-6	Software Development Case Study	31455
Project (Prostgraduate)	35592-6	Spanish Language and Culture	97x501
Pure Mathematics 3A	35313	Statistical Consulting	35469
Pure Mathematics 3B	35314	Statistics 1	35151
Quality Control	35355	Statistics 2	35252
Regression Analysis	35353	Systems Modelling	31424
Report	35599	Systems Software and Networks	31436
Russian	97x734	Thai	97x320
Scheduling Theory	35446	Theory of Financial Decision Making	25907
Seminar (Computing)	35394	Thesis	25910
Seminar (Mathematics)	35391	Thesis (Honours)	35498
Seminar (Operations Research)	35392	Thesis Seminar A	35496
Seminar (Statistics)	35393	Thesis Seminar B	35497
Simulation Modelling	35363	Time Series Analysis	35467

# SCHOOL OF COMPUTING SCIENCES

---

## Undergraduate courses

Bachelor of Science in Computing Science/  
Diploma in Information Technology  
Professional Practice<sup>1</sup>

Bachelor of Information Technology/  
Diploma in Information Technology  
Professional Practice<sup>1</sup>

Bachelor of Science in Computing Science/  
Bachelor of Arts in International Studies/  
Diploma in Information Technology  
Professional Practice<sup>1</sup>

Bachelor of Science in Computing Science/  
Bachelor of Laws/Diploma in Information  
Technology Professional Practice<sup>1</sup>

Bachelor of Business/Bachelor of Science in  
Computing Science/Diploma in Information  
Technology Professional Practice<sup>1</sup>

Bachelor of Science (Honours) in Computing  
Science/Diploma in Information Technology  
Professional Practice<sup>1</sup>

Bachelor of Computing/Diploma in  
Information Technology Professional  
Practice<sup>1</sup>

Bachelor of Computing/Bachelor of Arts in  
International Studies/Diploma in  
Information Technology Professional  
Practice<sup>1</sup>

---

<sup>1</sup> Subject to final approval.

## Postgraduate courses

### *Research degrees*

Doctor of Philosophy

Master of Science

### *Coursework degrees*

Master of Science in Computing

### **Management Development Program**

Master of Business in Information  
Technology Management

Graduate Diploma in Information  
Technology Management

Graduate Certificate in Information  
Technology Management

### **Interactive Multimedia**

Master of Interactive Multimedia

Graduate Diploma in Interactive Multimedia

Graduate Certificate in Interactive  
Multimedia

### **Internetworking**

Master of Science in Internetworking

Graduate Diploma in Internetworking

Graduate Certificate in Internetworking

### **Graduate Program**

Graduate Diploma in Information  
Technology

Graduate Certificate in Information  
Technology

## Academic advisers for 2000

Academic advisers in the School of Computing Sciences are located in Building 4, City campus (Broadway).

For calls made from outside the University, all extension numbers should be prefixed with (02) 9514.

	Ext	Room
<b>Undergraduate courses</b>		
<i>Director, Undergraduate Studies</i>		
Dr Bruce Howarth	1859	530
<i>Bachelor of Science in Computing Science</i>		
John Colville	1854	524
Chris S Johnson	1834	360
Chris W Johnson	1855	522
<i>Projects Coordinator</i>		
John Tu	1856	523
<i>Bachelor of Information Technology</i>		
Jim Underwood	1831	356
<i>Academic Liaison Officer (Special conditions, disability)</i>		
Dr Bruce Howarth	1859	530
<i>Electives Coordinator</i>		
John Tu	1856	523
<i>International Students</i>		
Richard Raban	1829	540
<b>Postgraduate courses</b>		
<i>All Graduate Certificates</i>		
Peter Bebbington	1828	353
<i>Graduate Diploma in Information Technology</i>		
Peter Bebbington	1828	353
Dr Kylie Sayer	1836	359
<i>Master of Business in Information Technology Management and articulated courses</i>		
Dr George Feuerlicht	1835	363
<i>Master of Interactive Multimedia and articulated courses</i>		
Dr Kevin Suffern	1845	512
<i>Master of Science in Internetworking and articulated courses</i>		
Associate Professor Tom Hintz	1865	548
<i>Master of Science in Computing and research degrees</i>		
Professor John Debenham	1837	437

**Note:** Each adviser has specific consultation times. These are displayed on the Ground Floor noticeboards.

## Computing facilities

The School provides a number of network-connected laboratories used in both teaching and research. The network, together with a number of SUN UNIX servers, provides the application software required and a number of network services (www, ftp, email, news), which can be used to access resources and information throughout the University and the world. The School's URL is:  
<http://www.socs.uts.edu.au>

### General purpose laboratories

- UNIX laboratories – A combination of X-terminals and UNIX workstations provides students with access to the UNIX environment. They are used by many of the School's subjects.
- PC laboratories – A number of PC laboratories provide access to the PC/Windows-type environment. They are used by a number of programming and business application subjects.
- Access – General access to these laboratories is between the hours of 9.00 a.m. and 9.00 p.m., Monday to Friday, during semester. On some occasions, these laboratories are booked for different subjects and, during these booked times, students not enrolled in those subjects should vacate that laboratory. Timetable bookings will be located on the door of each laboratory, and are available on the School's web site. After the first week of each semester's examination period, and also during vacation periods, the laboratories are available only between 9.00 a.m. and 6.00 p.m.

24-hour, seven-day-per-week access is provided to a PC and a Linux laboratory on Level 16, Building 1.

### Specific purpose laboratories

- Graphics laboratory – A number of Silicon Graphics UNIX computers provide for practical graphics usage.
- Parallel processing – This laboratory provides transputer-based systems.
- Collaborative systems – A research laboratory involved in applying computer and communications technology to improving work practices.
- Distributed Systems Technology Centre and Multimedia Laboratory – A laboratory used for research into distributed systems,

in particular software protocols, network management, and interaction between multimedia and networks.

- Usability laboratory – A studio set-up for the testing, evaluation and analysis of interaction between computers and human operators.
- Access – Access to these specific purpose laboratories will be arranged by the academic involved in a particular subject or research project.

### Remote access facility

The remote access facility provides modem access for students and staff through either terminal emulation or remote network connection using PPP. This allows users to access some of the School's computing systems and perform work from home.

### Help desk facility

The School's help desk – which is located in the Interface Room, Room 447, Building 4 – provides users with information on the usage of equipment, software and facilities, help with problems and a point of contact for reporting faults. The telephone number is (02) 9514 1869.

## Information Technology Division (ITD) facilities

ITD is a University division that provides general computing facilities for all students at UTS. It provides a University-wide network interconnection, a number of large UNIX servers and laboratories throughout the different campuses. The University provides access to Internet resources through its connection to AARNet.

### Laboratories

- ITD provides UNIX, PC and Macintosh laboratories throughout the University which are available for use by all students.
- Access to ITD's UNIX servers is available from all laboratories provided by ITD and the School of Computing Sciences.
- Buildings 2 and 5 laboratories provide 24-hour, seven-day-per-week access.
- Building 4 UNIX and PC laboratories provide 9.00 a.m. to 9.00 p.m. access, Monday to Friday only.

**Remote access facility**

The remote access facility provides for modem access by students and staff through terminal emulation or shell access (text only). This allows users to access the University's computing systems and perform work from home.

**Resource Centre facility**

ITD's Resource Centre and help desk – located on Level 9, Building 1 – provide assistance to the users of the academic computing facilities. During semester, the Resource Centre is open from 9.00 a.m. to 10.00 p.m., Monday to Friday. On weekends, and during semester breaks, it is open from 9.00 a.m. to 5.00 p.m. The help desk telephone number is (02) 9514 2222.

## PRIZES AND SCHOLARSHIPS

The School of Computing Sciences awards the following prizes and scholarship annually. The School also offers a range of postgraduate scholarships. For more information please refer to the School's website at

<http://www.socs.uts.edu.au>

**SITA/Equant Prize for Academic Excellence**

Established in 1996 by SITA, this prize is awarded annually to the student enrolled in the Bachelor of Science in Computing Science who achieves the best overall performance in the final year of the degree and who has completed the course within the minimum time. The prize is a cash award of \$1,000.

**CSC Australia Prize for Communications**

Since 1971, Computer Sciences Corporation Australia Pty Ltd has made available an award in the interests of furthering education and knowledge in the field of telecommunications. The prize is awarded to the student enrolled in the Bachelor of Science in Computing Science who achieves the best combined performance in the subjects Systems Software and Networks, and Distributed Software Programming. The prize is a cash award of \$750.

**Gilbert & Tobin Essay Prizes for Strategic IT Contract Management**

These prizes were established in 1998, and are awarded to two students who are enrolled in the Management Development Program (Information Technology) who, in the year for which the awards are made, have written the *Best* research essay and the *Highly Commended* research essay respectively in the subject, Strategic Information Technology Contract Management. The prizes are cash awards of \$1,000 and \$500 respectively.

**Insearch Institute of Commerce Doctoral Award**

As a result of the generous support of the Insearch Institute of Commerce, the Faculty of Mathematical and Computing Sciences is able to offer a full-time PhD scholarship for study in any area of computing science. The scholarship has a cash value of \$18,000 per year, tax free, and may be supplemented by a limited amount of teaching and/or research assistant activity within the Faculty.

**Insearch Institute of Commerce Prize**

This prize was established in 1998. It is awarded to the most outstanding international student graduating in the Bachelor of Computing or in the Bachelor of Science (Computing Science). The prize is a cash award of \$450.

**Insearch Institute of Commerce Prize for General Proficiency in the School of Computing Sciences**

This prize, established in 1999 (subject to final approval), is awarded to the graduating student each year who, having entered the School after completing the Diploma in Information Technology at the Insearch Institute of Commerce, has gained the highest WAM of such students over all subjects studied in either the Bachelor of Science in Computing Science or in the Bachelor of Computing. The prize is a cash award of \$500.

### **Mastech Asia Pacific Pty Ltd Tuition Scholarship**

This tuition scholarship, established in 1995 by Asia Pacific Computer Consultants, now Mastech Asia Pacific Pty Ltd, may be awarded annually to an able, needy, first-year, full-time student who is currently enrolled in the Bachelor of Science in Computing Science degree, and for whom this is the first year of tertiary study. The total value of the scholarship is \$10,000.

### **Oracle Database Prize**

Established in 1994, the Oracle Database prize is awarded to the Bachelor of Science in Computing Science student who achieves the highest aggregate mark in the subjects Distributed Databases and Client/Server Computing, and Database Design. The prize is a cash award of \$400.

### **Software Quality Association (NSW) Prize for Software Quality Assurance**

This prize was established in 1997 by the Software Quality Association (NSW). It is awarded annually to the Bachelor of Science in Computing Science or the Bachelor of Information Technology student who achieves the highest mark in the subject, Software Quality Assurance. The prize has a cash value of \$400.

### **Solution 6 Information Technology Planning and Design Prize**

Established in 1985 by Computer Automated Business Systems Pty Ltd, now a part of Solution 6, this prize is awarded annually to the group of final-year students, enrolled in either the Bachelor of Science in Computing Science or the Bachelor of Information Technology, who obtain the highest mark in the subject, Information Technology Planning and Design. The cash award of \$1,000 is shared among all students in the group.

### **Westpac Information Systems Award**

This prize was established in 1987 by the Westpac Banking Corporation. It is awarded annually to the full-time Bachelor of Science in Computing Science student who develops the best IT strategic plan based on his or her Industrial Training experience. The prize has a cash value of \$1,000.

## School contacts

All staff of the School of Computing Sciences are located in Building 4, City campus (Broadway). For calls made from outside the University, all extension numbers should be prefixed with (02) 9514. All email addresses should be suffixed with '@socs.uts.edu.au'.

Name	Ext	Room	Email
<i>Director, Graduate Education</i>			
Peter Bebbington	1828	353	peterb
Jeff Clark	1827	355	clark
John Colville	1854	524	colville
<i>Director, Postgraduate Studies</i>			
Professor John Debenham	1837	437	debenham
Associate Professor Jenny Edwards	1844		jenny
Jamal El-Den	1830	536	jamal
Dr George Feuerlicht	1835	363	jiri
Dr Valerie Gay	1103	364	valerie
Nigel Hamilton	1833	364	nige
Professor Igor Hawryszkiewicz	1809	372	igorh
Xiangjian He	1816	537	sean
Professor Brian Henderson-Sellers	1687	370	brian
Associate Professor Tom Hintz	1865	548	hintz
<i>Director, Undergraduate Studies</i>			
Dr Bruce Howarth	1859	530	bruce
Mao Lin Huang	1858	520	maolin
Professor John Hughes	1344	436	hughes
Associate Professor Barry Jay	1814	514	cbj
Chris S Johnson	1834	360	chrisj
Chris W Johnson	1855	522	chris
Dr Gabi Keller	1874	517	keller
Dr Paul Kennedy	1875	539	paulk
Elaine Lawrence	1861	533	elaine
Dr Brian Lederer	2263	543	brianl
Dr Chungfei Liu	1860	365	liu
<i>Executive Assistant</i>			
Dr Kim O'Toole	1808	367	kimo
Dr Tom Osborn	1852	519	osborn
Dr Sattiraju Prabhakar	1851	515	prabhakar
Richard Raban	1829	540	richard
Dr Robert Rist	1849	516	rist
Dr Toni Roberston	1966	535	toni
Dr Kylie Sayer	1836	359	kylie
Dr Kevin Suffern	1845	512	kevin
Ury Szewcow	1862	534	ury
John Tu	1856	523	vohao
Jim Underwood	1831	356	jim
Jerry Vochtelo	1882	532	jerry
<i>Director, Industry Liaison</i>			
Alice Watkins	1885	526	alicew
Associate Professor David Wilson	1832	354	davidw
Bernard Wong	1825	357	bernard
<i>Administrative Assistant</i>			
Marie Woessner	1258	361a	marie
Interface Room	1869	447	

# UNDERGRADUATE COURSES

## Bachelor of Science in Computing Science

- ◆ *Course code: MC02*
- ◆ *Testamur title: Bachelor of Science in Computing Science*
- ◆ *Abbreviation: BSc*
- ◆ *Course fee: HECS*

This course aims to provide a sound education in all aspects of computing for students who intend to make a career in the profession. It is intended that the course will provide a suitable background covering all aspects of information technology, short of the actual design and construction of hardware systems.

The course provides an in-depth study of computing science and its applications and, in addition, support subjects are included to enable graduates to fulfil an appropriate function in the sphere of business activity. It is intended that the formal studies will be treated in a manner that will encourage initiative. Not only will the course provide a suitable framework for a professional career, it will also form a basis from which postgraduate studies may begin.

The course consists of six academic semesters of full-time study or the equivalent in part-time attendance, and a period of Industrial Training. Holders of the degree are eligible for membership of the Australian Computer Society at the professional level.

### Grading of awards – pre-1998

Students are graded for awards by a two-stage process involving first qualifying and then grading students.

The subjects to be included in the grading process are the core subjects, excluding those normally taken during Stages 1 and 2 of the part-time course or the first year of the full-time course. All core subjects must be passed. Any of those subjects that have been failed and subsequently passed will be included with a raw mark of 50 per cent.

### Qualifying

#### *Pass degree*

A student who has accumulated 144 credit points and has an average raw mark of 50 per cent or greater will qualify for a Pass degree.

### Grading

#### *Honours degree*

The average raw marks required to achieve the Honours grades in 1997 and 1998 were:

- First Class Honours: 75 per cent
- Second Class Honours: 69 per cent

The grading of qualifying students is carried out by the School's Examination Review Committee on an individual basis. The Committee is provided with the following information on each qualifier:

- any failures, including subject details and whether or not a failure was of a technical nature;
- the subject details and marks for all electives undertaken;
- the time taken to complete the course in terms of stages, excluding periods of leave of absence; and
- the average mark for each stage during the course.

### Grading of awards – post-1998

Students commencing the degree from 1998 onwards will no longer be awarded Honours just on the basis of marks in subjects taken in the degree. The BSc will now be awarded with Distinction, Credit or Pass using a similar system to that previously used for awarding Honours.

To gain Honours, students will have to enrol in a separate Honours program and reach an appropriate level in their studies. Full details of this program and its grading are given in the section of this handbook on Honours.

### Diploma in Information Technology Professional Practice

It is likely that, from 2000 onwards, a 12-credit-point Diploma of Information Technology Professional Practice will be introduced in conjunction with Industrial Training for all undergraduate courses within the School of Computing Sciences.

### Industrial Training

Full-time students normally undertake Industrial Training after completing Year 2, and part-time students after completing Year 4.

No student will be permitted to enrol in Industrial Training until they have completed successfully (or have been exempted) from all subjects that are prerequisites for Industrial Training, namely: 31414 Information Systems; 31415 Principles of Software Development A; 31416 Computer Systems Architecture; 31417 Computing Practice; 31424 Systems Modelling; 31429 Procedural Programming; 31434 Database Design; and 31436 Systems Software and Networks.

Students will not be permitted to enrol in Industrial Training until they have obtained suitable employment.

To gain credit for Industrial Training, students are required to obtain an approved, full-time job within the information industry. The duration of Industrial Training is a minimum of nine months for full-time students or 18 months for part-time students.

In exceptional circumstances, students may be granted an exemption from Industrial Training if they have completed at least 12 months of suitable full-time employment. In general, contracting and self employment are not regarded as suitable employment.

No student may apply for an exemption from Industrial Training until after successful completion (or exemption) from all subjects that are prerequisites for Industrial Training.

During Industrial Training, students are required to behave in a professional manner, and to keep the School informed of the status of their employment at all times so that the School is able to assess their experience. Each year the School of Computing Sciences publishes an *Industrial Training Student Guide* (for full-time students) which sets out in detail what is required to pass the subject. Students will receive a copy of this Guide at the Industrial Training information session held in May each year.

Although the securing of suitable employment during Industrial Training is the student's responsibility, the School provides assistance to all Industrial Training students. Students who wish to benefit from the direct assistance of the School in finding an Industrial Training position should refer to the *Industrial Training Student Guide* for the procedure to be followed.

Students who wish to seek an Industrial Training position without the direct assistance of the School should first make an appointment to see the Industry Liaison Officer, who will provide a description of the requirements of an Industrial Training position. If a student finds employment, a second appointment must be made to see the Industry Liaison

Officer to obtain certification that the employment is suitable for Industrial Training.

Full-time Industrial Training students are assessed by members of the academic staff who normally visit students during the first semester of their employment.

In general, students find Industrial Training extremely beneficial in relating the final year of coursework to the practical needs of the information industry, and this experience can be cited when applying for graduate career positions.

## Exemptions

Exemptions may be granted on the basis of recent academic study (within the last three years) towards a degree. Students must be able to demonstrate that the knowledge is current. Exemption from core subjects may be granted where subjects successfully completed previously coincide with BSc subjects.

Students are expected to apply for exemptions, for which they believe they are eligible, at the commencement of their first year of study. Exemptions are usually processed by the School immediately following enrolment.

### Exemptions for transfer students from ATN Universities

The ATN Universities have an agreement in place concerning exemptions for study in equivalent courses for students transferring between ATN Universities. Please contact the Director of Undergraduate Studies for details.

### Exemptions for holders of TAFE Associate Diplomas and Diplomas

Current TAFE courses operate at three levels: Level 3, Level 4, and Diploma. Level 3 forms the compulsory foundation for the other levels. Level 4 consists of a number of Specialist Groups. Students complete two Specialist Groups plus extra modules and a project to gain the Diploma. The required mixture of Specialist Groups and the Project area determine the name of the Diploma.

### Exemption principles

Exemptions for specific SOCS subjects will be granted on the basis of Level 3 studies and the Specialist Groups. Students who have completed a Diploma will also be granted a number of credit points of 'Unspecified CS/IS Electives', the number depending upon the relevance of a particular Diploma to the Bachelor of Science in Computing Science. Note that the granting of exemptions does not imply automatic entry into a course.

### Exemption details

The following details apply to the components leading to a Diploma in Information Technology. Students from the Electrical and Electronic Engineering Diplomas may also be eligible for credit. Students who have only completed 3601 Certificate Level 3 will be granted exemption from 31417 Computing Practice.

Students who have completed Level 4 or a Diploma will receive exemptions for the following subjects:

TAFE Specialist Group(s)	UTS Subject exemptions
3602 PC Support <i>and</i>	31416 Computer Systems Architecture
3604 Network Support	
3605 3GL Programming	31917 Commercial Programming in Cobol
3606 4GL & Database Programming <i>including Modules 3606F, 3606G and 3606J (or acceptable equivalents)</i>	31434 Database Design
3607 C Programming	31429 Procedural Programming
3608 Object Programming	31860 Object-oriented Programming and C++
3609 Systems Analysis and Design <i>or</i>	31414 Information Systems
3615 Diploma of Information Technology (Business Systems)	

In addition, students who have completed a Diploma will be granted credit points for 'Unspecified CS/IS Electives' to give a **total** of 30 credit points for the following courses:

- 3613 Diploma of Information Technology (Applications Programming)
- 3614 Diploma of Information Technology (Analyst/Programmer)
- 3615 Diploma of Information Technology (Business Systems)

Because it is less relevant to the BSc(CompSc), students in:

- 3612 Diploma of Information Technology (PC and Network Support)

will receive 12 credit points of 'Unspecified CS/IS Electives' giving a total of 24 credit points of exemptions.

**Note:** The TAFE Specialist Group in Multimedia has yet to be assessed.

### Pre-1995 course

Students who commenced the BSc prior to 1995 should consult the Director, Undergraduate Studies, to determine their course program.

### Program for students who commenced from 1995 onwards

Students should note that it is likely that a revised program will be in effect from 2001 or possibly 2000. Students should also note that it is planned to introduce a Diploma in Information Technology Professional Practice in conjunction with Industrial Training.

#### Recommended full-time program

##### Year 1

##### Autumn semester

31414	Information Systems	6cp
31415	Principles of Software Development A	6cp
31416	Computer Systems Architecture	6cp
31417	Computing Practice	6cp

##### Spring semester

31424	Systems Modelling	6cp
31425	Principles of Software Development B	6cp
31428	Quantitative Modelling	6cp
31429	Procedural Programming	6cp

##### Year 2

##### Autumn semester

22615	Accounting Information Systems	6cp
31434	Database Design	6cp
31436	Systems Software and Networks Electives	8cp
		6cp

**Spring semester**

31444	Systems Design and Development	10cp
	Electives	12cp

**Year 3****Autumn semester**

31696	Industrial Training	0cp
-------	---------------------	-----

**Spring semester**

31697	Industrial Training	0cp
-------	---------------------	-----

**Year 4****Autumn semester**

31454	Project Management and the Professional	6cp
31455	Software Development Case Study	6cp
	Electives	12cp

**Spring semester**

31455	Software Development Case Study (cont.)	6cp
31464	Information Technology Planning and Design	6cp
	Electives	12cp

**Recommended part-time program****Year 1****Autumn semester**

• 31416	Computer Systems Architecture	6cp
• 31417	Computing Practice	6cp

**• Spring semester**

• 31414	Information Systems	6cp
• 31415	Principles of Software Development A	6cp

**Year 2****Autumn semester**

31425	Principles of Software Development B	6cp
• 31428	Quantitative Modelling	6cp

**Spring semester**

• 31424	Systems Modelling	6cp
31429	Procedural Programming	6cp

**Year 3****Autumn semester**

• 31434	Database Design	6cp
	Elective	6cp

**Spring semester**

31436	Systems Software and Networks	8cp
	Elective	6cp

**Year 4****Autumn semester**

31444	Systems Design and Development	10cp
-------	--------------------------------	------

**Spring semester**

22615	Accounting Information Systems	6cp
	Elective	6cp

**Year 5****Autumn semester**

31455	Software Development Case Study	6cp
	Elective	6cp
31698	Industrial Training	0cp

**Spring semester**

31455	Software Development Case Study (cont.)	6cp
31454	Project Management and the Professional	6cp
31698	Industrial Training	0cp

**Year 6****Autumn semester**

31464	Information Technology Planning and Design	6cp
	Elective	6cp
31699	Industrial Training	0cp

**Spring semester**

	Elective	12cp
31699	Industrial Training	0cp

**Electives**

Students should refer to the Bachelor of Science in Computing Science prerequisite chart.

Students must do a minimum of 42 credit points of electives, of which 18 credit points must be taken from the School of Computing Sciences. The remaining elective credit points (minimum 24) may also be taken from the School of Computing Sciences. Alternatively, a student may opt to take a coherent staged group of subjects, normally a formally approved sub-major from another school or faculty. Typically, these are from the Faculties of Business, Engineering, Humanities and Social Sciences, Science, and the School of Mathematical Sciences.

Many subjects which are offered by other schools and faculties may contain material which is already covered in the Computing Science degree. Students who would like to take subjects from other parts of the University which are not part of sub-majors approved for Computing Sciences students (as listed in this handbook), should discuss their proposed

subjects with the Electives Coordinator or an Academic Adviser. (It should be noted that the norm for electives is 42 credit points, but as subjects in other faculties are worth varying amounts of credit points, a student's total elective credit points may exceed 42.)

Students should be aware that they may enrol in subjects in another faculty only if a class place is available. This applies particularly to the Faculties of Business, and Humanities and Social Sciences. This will change in 2000.

## Projects

In lieu of one elective subject, students may take one six-credit-point project. In many cases, these projects may be completed over the Christmas or between-semester breaks, if desired.

A list of projects nominated by various staff members may be viewed on the SUNs, by logging in as **projects** and following the instructions. Students should also complete a Project Registration form, available from the Projects Coordinator, who will answer any queries. Students who have their own ideas for projects may approach relevant staff members to be their supervisors and must also see the Projects Coordinator for approval. Enrolment will not be allowed without an approved Project Registration form.

Students may not use work done in the normal course of duties as an Industrial Training student, or as a part-time student, as a project. Students may, however, do a project that is related to their work if it is done outside normal work hours. In this case, the student's work supervisor would probably become a joint supervisor of the project. Projects are also available through the UTS Shopfront, telephone (02) 9514 2900.

As a general guide, a student doing a six-credit-point project is expected to spend a **minimum** of 150 hours on the project.

## Sub-majors

### University-wide sub-majors

#### *Aboriginal Studies sub-major* **24cp**

Telephone (02) 9514 2057

The Faculties of Humanities and Social Sciences and Education offer 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. The role of the media and written or spoken communication are the major focuses of these analyses.

015110	Aboriginal Cultures and Philosophies	8cp
54230	Aboriginal Social and Political History	8cp
	<i>plus at least one of</i>	
54231	Aboriginal People and the Media	8cp
54330	The Politics of Aboriginal History	8cp
54331	Aboriginal Forms of Discourse	8cp

### Computer Graphics

This sub-major provides students with an opportunity to study the area of computer graphics in-depth.

#### Sequence

31140	Introduction to Computer Graphics	6cp
31605	Computer Graphics Rendering Techniques	6cp
31603	3D Computer Animation	6cp
31352	Project	6cp

**Note:** The subject 31352 Project will involve an in-depth investigation of an area of computer graphics involving programming. Students will not be allowed to commence the project until they have successfully completed 31605 Computer Graphics Rendering Techniques.

**Electronic Commerce (General)**

This sub-major is suitable for students from all faculties, and emphasises the analysis and system design skills and applications of technology to develop systems.

**Sequence**

31512	Networking 1	6cp
31749	Internet Commerce	6cp
31950	Networked Enterprise Design	6cp
31606	Virtual Communities	6cp

**Note:** In some circumstances, the subject 31436 System Software and Networks may be substituted for 31512 Networking 1.

**Electronic Commerce (Technical)**

This sub-major is suitable for students from the Faculty of Engineering or the School of Computing Sciences, and emphasises technical implementation issues and program and system development skills.

**Sequence**

31512	Networking 1	6cp
31749	Internet Commerce	6cp
31748	Programming on the Internet	6cp
31750	Intelligent Agents in Java	6cp

**Note:** Under some circumstances, the subject 31436 System Software and Networks may be substituted for 31512 Networking 1.

**Mathematical Sciences**

Contact person: J Hogg

Telephone (02) 9514 2238; Room 1524, Building 1

**Sub-major in Operations Research**

33401	Introductory Mathematical Methods
35140	Operations Research Modelling
35241	Optimisation 1
	<i>one subject chosen from:</i>
35342	Optimisation 2
35344	Network Optimisation
35363	Simulation Modelling

**Sub-major in Statistics**

33401	Introductory Mathematical Methods
35252	Statistics 2
	<i>two subjects chosen from:</i>
35353	Regression Analysis
35355	Quality Control
35356	Design and Analysis of Experiments
35361	Probability and Stochastic Processes

**Humanities and Social Sciences**

The Faculty of Humanities and Social Sciences offers electives and elective sub-majors to students across the University.

**Communication and English Language Studies**

Offered through the ELSSA Centre, these subjects are designed for students with particular needs in relation to language and study skills.

59316	Essay Writing	4cp
59317	Report Writing	4cp

**Other electives**

Various other electives are available through the Faculty of Humanities and Social Sciences.

Information on the timetabling of subjects can be obtained by viewing the Electives timetable displayed outside the Faculty Student Centre, Faculty of Humanities and Social Sciences, in the corridors on Level 2, Building 3; the *2000 Faculty of Humanities and Social Sciences Handbook* (available for viewing in the Faculty Student Centre); and by visiting or calling the Faculty Student Centre, Faculty of Humanities and Social Sciences, Level 2, Building 3, telephone (02) 9415 2300.

**Business**

The following sub-majors are offered to Computing Science students by the Faculty of Business. Students may undertake other sub-majors if they have the necessary prerequisites. Further information on these sub-majors can be obtained from the *2000 Faculty of Business Handbook* or the Student Liaison Unit, Faculty of Business, or by telephoning the relevant School as indicated.

Students are advised to check the Faculty of Business timetable at the time of enrolment for any changes in subject numbers/names.

**School of Accounting**

Telephone (02) 9514 3560

**Financial Reporting (22cp)**

22205	Accounting B	4cp
22320	Accounting for Business Combinations	6cp
22420	Accounting Standards and Regulation	6cp
	<i>plus one of the following</i>	
22319	Issues in Financial Statement Analysis	6cp
22240	International Accounting	6cp
22206	Government Accounting	6cp
22610	Accounting for Insolvency	6cp

**Management Reporting (22cp)**

22205	Accounting B	4cp
22318	Contemporary Issues in Management Accounting	6cp
22321	Cost Management Systems	6cp
22421	Managerial Decisions and Control	6cp

**Small Business Accounting (22cp)**

22205	Accounting B	4cp
22566	Accounting for Small Business 1	6cp
22309	Accounting for Overseas Transactions	6cp
22567	Accounting for Small Business 2	6cp

**Note:** 22615 Accounting Information Systems will be accepted as the prerequisite subject for 22205 Accounting B.

These combinations have a value of 22 credit points. A sub-major must consist of a minimum of 24 credit points. It is suggested that students take another suitable elective to complete the sub-major.

**School of Finance and Economics**

Telephone (02) 9514 3633

**Economics (26cp)**

25209	Macroeconomics	4cp
25210	Microeconomic Theory and Policy	6cp
25303	Industry Economics	6cp
25110	Microeconomics	4cp
25309	Macroeconomic Theory and Policy	6cp

**School of Management**

Telephone (02) 9514 3600

**Employment Relations (26cp)**

21125	International Business Environment	4cp
21130	Management and Organisations	4cp
21306	International Employment Relations	6cp
21407	Strategic Human Resource Management	6cp
31735	Information Systems and Organisation Development	6cp

**International Management (26cp)**

21125	International Business Environment	4cp
21130	Management and Organisations	4cp
21591	International Management	6cp
21531	Managing the International Organisation	6cp
31735	Information Systems and Organisation Development	6cp

**School of Marketing**

Telephone (02) 9514 3422

**Introductory Advertising (28cp)**

24105	Marketing Principles	4cp
24202	Consumer Behaviour	6cp
24210	Advertising and Promotions Management	6cp
24309	Introductory Marketing Research	6cp
59330	Advertising Practice	6cp
	<i>or</i>	
59333	Advertising Strategies	6cp

**Introductory Marketing (28cp)**

24105	Marketing Principles	4cp
24202	Consumer Behaviour	6cp
24205	Business Marketing	6cp
24220	International Marketing	6cp
24309	Introductory Marketing Research	6cp

## Science

### Physics (General) (24cp)

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.

The minimum of 24 credit points may be made up as follows:

Subject number	Subject name	Semester offered	CP	Prerequisites
68101	Physics 1C	A,S	6	
68201	Physics 2	A,S	6	Physics 1C
<i>plus two of the following</i>				
68311	Physics 3	A	6	Physics 2
68312	Applied Physics 1	A	6	Physics 2
68412	Applied Physics 2	S	6	Physics 2

### Electronics and Computer Interfacing (24cp)

This sub-major provides the knowledge needed to use microprocessors for recording and analysing experimental measurements. It progresses from digital electronic circuitry to microcomputer architecture and then to transducers and devices for interfacing with the real world.

Subject number	Subject name	Semester offered	CP	Prerequisites
68101	Physics 1C <sup>1</sup>	A,S	6	
68201	Physics 2	A,S	6	Physics 1C
68314	Electronics	A,S	6	Physics 2
68514	Electronics and Interfacing	A	6	Electronics

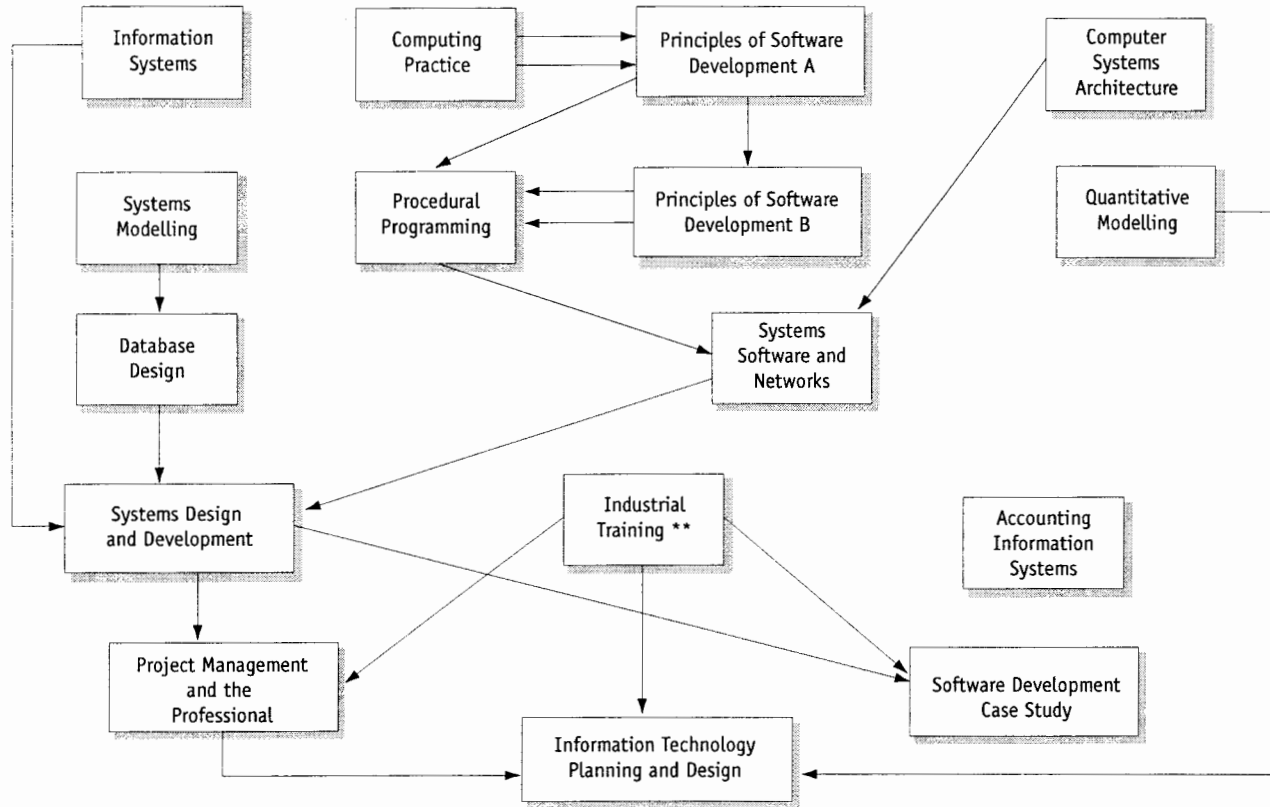
<sup>1</sup> Students with a sufficiently strong background may substitute 68312 Applied Physics 1 (prerequisite Physics 2) for this subject.

For further information about Science subjects, see the 2000 *Faculty of Science Handbook*.

## Electives from other universities

Students wishing to do electives outside the University **must** see the Electives Coordinator to discuss the proposal. Special approval must be sought well before the intended semester of study. Students may undertake subjects outside the University as electives **only** if no comparable subject is offered by the University.

## BSc(Computing Science) prerequisite chart



\*\* Prerequisites for Industrial Training are: Computing Practice, Computing Systems Architecture, Database Design, Information Systems, Principles of Software Development A, Procedural Programming, Systems Modelling, and Systems Software and Networks.

→ Prerequisite or corequisite

## Bachelor of Information Technology

- ◆ *Course code:* MC03
- ◆ *Testamur title:* Bachelor of Information Technology
- ◆ *Abbreviation:* BInfTech
- ◆ *Course fee:* HECS

This course is a cooperative education program in computer information systems and has been developed by the School of Computing Sciences in cooperation with a group of private and public sector employers. The course is of three years' duration and involves four semesters of full-time study at the University and two semesters of full-time study and practical experience in industry. The industry-based semesters are of 24 weeks' duration, and a 42-week academic year is the norm for the course.

Year	Semester 1	Semester 2
1	UTS	Industry
2	UTS	UTS
3	Industry	UTS

The program differs from existing cooperative education courses in that during the industry-based semesters, students will follow a structured program designed jointly by the University and the employer group, including formal coursework taught in industry. This coursework is assessed to University and business standards and familiarises students with business needs and requirements. During the industry-based semesters, students will be exposed to real problems within an environment quite different from that of the University. The resources of industry will be available to support the education of students.

The central curriculum of the course is information systems; this is supported by studies in management, accounting, finance and marketing, as well as the necessary background subjects in computing science and programming. The active participation of industry practitioners in course design and course delivery will further ensure that graduates of the course are well equipped with skills that are relevant to present and future industry needs.

The two industry-based semesters will be spent with two different companies. Students are not employees of the company, and will not be obliged to find employment with a given company on completion of their studies.

Nevertheless, students are encouraged to find employment within the group of sponsoring employers.

The number of students admitted each year will be limited by the number of sponsorship commitments secured from employers to a maximum of 50 places.

Each student admitted to the course will receive a scholarship for the duration of the course, subject to satisfactory performance and to certain conditions detailed further in this handbook. Each of the industry partners undertakes to sponsor a stated number of students, and contributes the full amount of their scholarship to a fund administered by the University.

The industry partners also provide the industry-based semester facilities for each of the students assigned to them.

Selection to the course is based on HSC results and on performance at an interview. Interviews are conducted by panels comprising representatives of the University and the industry group. Applicants will be assessed for their suitability to the industrial as well as the academic components of the course. The course is aimed primarily at school leavers and is limited to citizens and permanent residents of Australia. Mature age students are not normally admitted.

The Bachelor of Information Technology satisfies all of the requirements for professional-level membership of the Australian Computer Society, the industry's professional body.

### Grading of awards

The BInfTech is awarded as a Pass degree, a degree with Credit or a degree with Distinction.

The grading is based on the Weighted Average Mark (WAM) of core subjects (with the exception of the industry-based semester subjects, Information Systems Practice and Contemporary Information Technology 2) and performance in the final industry-based semester.

The grading of qualifying students is carried out by the School's Examination Review Committee on an individual basis. This Committee takes account of input from the BInfTech Course Steering Committee. The Examination Review Committee is provided with the same information as that made available for the grading of BSc in Computing

Science students, with one important addition: the overall assessment, by industry, of the final industry-based semester.

## Course program

### Year 1

#### **Autumn semester – UTS**

31414	Information Systems	6cp
31415	Principles of Software Development A	6cp
31416	Computer Systems Architecture	6cp
31718	Contemporary Information Technology 1	6cp

#### **Spring semester – Industry**

31722	Commercial Programming	5cp
31770	Industry Project 1	5cp
31771	Business Requirements Analysis	5cp
31779	Applications of Information Technology 1	5cp

### Year 2

#### **Autumn semester – UTS**

22615	Accounting Information Systems	6cp
31424	Systems Modelling	6cp
31434	Database Design	6cp
31436	Systems Software and Networks	8cp

#### **Spring semester – UTS**

31444	Systems Design and Development	10cp
31443	Distributed Databases and Client/Server Computing	6cp
31735	Information Systems and Organisation Development	6cp
	Elective	6cp

### Year 3

#### **Autumn semester – Industry**

31756	Project Management	5cp
31781	Business Systems Design	5cp
31789	Applications of Information Technology 2	5cp
31790	Industry Project 2	5cp

#### **Spring semester – UTS**

24105	Marketing Principles	4cp
31464	Information Technology Planning and Design	6cp
317xx	Business Processes and Information Technology Strategy	6cp
31769	Contemporary Information Technology 2	4cp
	Elective	6cp

**Note:** It is likely that there will be revisions to the program commencing in 2000 or 2001. Students should also note that it is planned to introduce a Diploma in Information Technology Professional Practice in conjunction with the Industrial Training.

## Electives

Electives may be taken from the Faculty of Law, the Faculty of Business or the School of Computing Sciences, subject to the approval of the Bachelor of Information Technology Coordinator.

## Special conditions

There are special conditions relating to students enrolled in the Bachelor of Information Technology.

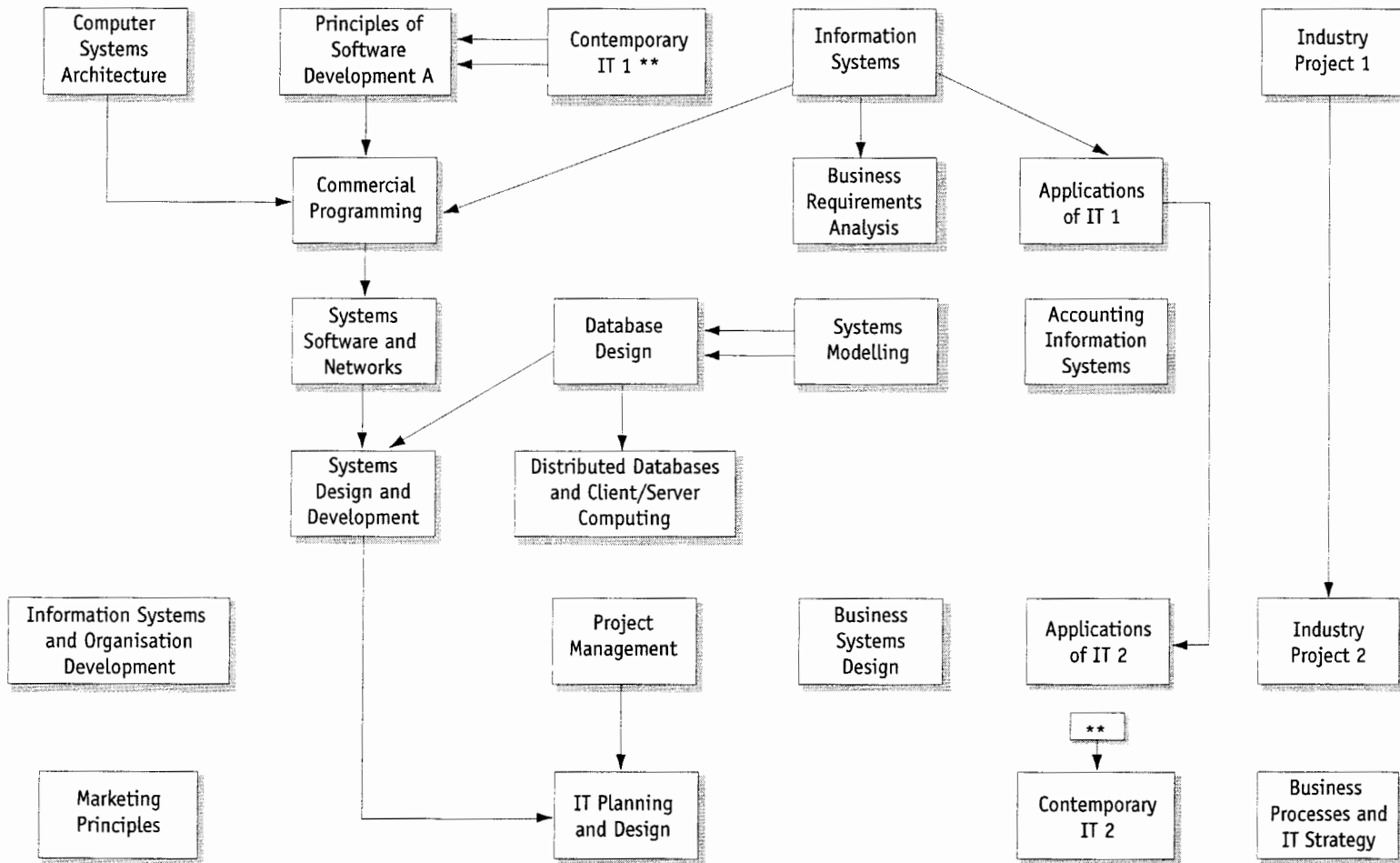
**Leave of absence** will not normally be granted to students, except under extraordinary circumstances and subject to satisfactory arrangements being possible. Likewise, **withdrawal** from the course and subsequent re-admission is not normally granted. Students are reminded that withdrawal without penalty from any course at the University is only possible up to the deadlines imposed by the University. After such deadlines, students will be expected to complete all assessment tasks for subjects in which they are enrolled.

**Variations to the approved program of study** for the Bachelor of Information Technology are restricted. No industry-based subject may be deleted from the program, except under extraordinary circumstances and at the discretion of the Course Steering Committee and the School of Computing Sciences. No industry-based subject may be taken during a University-based semester. The taking of additional subjects during an industry-based semester is seen as unusual and may only be done at the discretion of the Course Steering Committee and the School.

The School will not recommend probation for unsatisfactory academic performance. Instead, the School will recommend to the Faculty Board that a student be **excluded** under any of the following circumstances:

- a student fails any subject for the second time;
- a student gains less than 50 per cent of the credit points for which he or she is enrolled in that assessment period;
- a student fails any subject that is part of the program of an industry-based semester (there is provision for a supplementary examination to be taken in these subjects following a failure on the first attempt) or a student performs unsatisfactorily during an industry-based semester; or

## Bachelor of Information Technology prerequisite chart



- immediately prior to the commencement of an industry-based semester, a student has still to complete more than one subject in the normal program of the course to that stage.

Appeals against exclusion will be dealt with by the University's Appeals Committee (of the Academic Board), which will take into account the recommendation of the Course Steering Committee.

### Industry semesters

The dates of the industry-based semesters for 2000 are as follows:

Autumn semester (third-year students):  
Monday 17 January 2000–Friday 30 June 2000

Spring semester (first-year students):  
Monday 3 July 2000–Friday 15 December 2000

Students are expected to attend their assigned sponsoring company on a full-time basis throughout these periods. Students cannot expect any absences to be approved during the industry-based semesters.

### Personal details

Students must inform the University should their name or address change. BlnfTech students **must** also inform Des Saunders, Industry Liaison Officer, of any changes to personal details. Students who wish to change the method of payment of the scholarship should contact the Salaries Office of the University's Financial Services Unit on (02) 9514 2852.

### Scholarship

The scholarship will be paid at three different and increasing levels; all first-year students will start at Level 1. At the end of each year, all BlnfTech students with satisfactory progress will move from their current level to the next level.

The levels for 2000 are as follows:

Level 1: \$11,000 per annum

Level 2: \$11,500 per annum

Level 3: \$12,000 per annum

The scholarship paid to BlnfTech students has been ruled as tax exempt. The reference for the ruling by the Australian Tax Office is 6/SCHOLS/24, dated 29 February 1988.

## Bachelor of Science in Computing Science/ Bachelor of Arts in International Studies

---

♦ *Course code: MC05*

♦ *Testamur title: Bachelor of Science in Computing Science/Bachelor of Arts in International Studies*

♦ *Abbreviation: BSc BA*

♦ *Course fee: HECS*

---

This course combines the Bachelor of Science in Computing Science with the University's Bachelor of Arts in International Studies. Computing Science is integrated with a major in the language and culture of another country. The course is of six years' duration and students spend the fourth year of study at a university overseas. The fifth and sixth years are completed part-time.

### Studies in Computing Sciences

The Computing Science component of the combined degree aims to provide a sound education in all aspects of computing for students who intend to follow a career in the profession. It is intended that the course will provide a suitable background covering all aspects of information technology, short of the actual design and construction of hardware systems.

For further information, see the course outline for the Bachelor of Science in Computing Science in this handbook.

### International Studies

The Bachelor of Arts in International Studies is designed to increase awareness and understanding of the non-English-speaking world.

Students take one of the following majors in the International Studies program: Argentina, Australia and the Asia-Pacific Region, Chile, China, France, Germany, Greece, Indonesia, Italy, Japan, Malaysia, Mexico, Russia, South China, Spain, Taiwan, Thailand and Vietnam. They study an appropriate language and culture; learn about the contemporary society of their country of specialisation; and then spend an academic year of study at a university in their country of specialisation. In general, the International Studies program has no prior language requirement, except for entry to the Greece and Vietnam majors which is restricted to students who have a sound

working knowledge of the language of their selected specialisation. Details of each major can be found in the 2000 *Institute for International Studies Handbook*.

The costs of tuition in host institutions overseas and travel between Sydney and the designated host institutions are borne by UTS. Visa fees are also paid by UTS and students are covered by the UTS Student Travel Insurance policy during their period of in-country study. The UTS medical service is available to students for medical examinations for visas, vaccinations and other country-specific health advice. Students must meet the costs of food, accommodation, transport and other maintenance during the period of in-country study. These costs vary from country to country and year to year. Before departure, students will receive an In-country Study Guide which will provide, among other things, information on cost of living.

For native speakers, there may be opportunities for students to undertake Industrial Training during In-country Study.

### Course structure

The structure of the six-year course in Computing Science and International Studies is derived from the combination of the Bachelor of Science in Computing Science with the Bachelor of Arts in International Studies.

All arrangements currently in force for both the Bachelor of Science in Computing Science and the Bachelor of Arts in International Studies apply equally to the combined degree program.

To graduate, a student is required to have completed 240 credit points: 144 credit points in Computing Science and 96 credit points in International Studies.

All students enrolled in the Bachelor of Science in Computing Science are required to pass two Industrial Training subjects. There are a substantial number of prerequisites for Industrial Training, which in this combined degree program is normally undertaken in part-time Years 5 and 6. To gain credit for Industrial Training, students are required to obtain an approved, full-time job within the information technology industry.

The Bachelor of Arts in International Studies requires undergraduates to study a major – a region or country of specialisation – over a minimum of three years. Students study language and culture for at least two years in Sydney, and this is followed by a period of study overseas.

Each of the specialisations within the International Studies program is 96 credit points, and includes 32 credit points (four subjects) of instruction in an appropriate Language and Culture; 16 credit points (two subjects) of the study of Contemporary Society and its context; and 48 credit points (two semesters) of study at a university or institution of higher education in the country or region of specialisation.

The International Studies subjects listed in the course structure are subjects of enrolment referring to common units of instruction across the University.

### Language and Culture

The study of Language and Culture at UTS depends on the individual student's level of language proficiency before entry to the UTS program. There is a range of entry levels to the various Language and Culture programs available. Most are available at beginners' and post-HSC levels, and some at more advanced levels.

The following Language and Culture programs will be available at UTS as part of the International Studies program: Cantonese, Chinese, Indonesian, Japanese, Malaysian and Spanish. In addition, arrangements have been made for the delivery of French, German, Greek, Italian, Russian and Thai.

### Contemporary Society

For each specialisation in the International Studies program, students have a prescribed pair of units of instruction in Contemporary Society, taught by the Institute for International Studies in cooperation with the Faculty of Humanities and Social Sciences.

The first is Comparative Social Change, which is a subject that provides a general introduction to comparative social and political change. It is designed to locate further study of the major in its intellectual and physical contexts.

The second is a subject that provides a more detailed introduction to the student area of specialisation and students do the subject as appropriate to their major. The subjects are:

Major	Contemporary Society subject
Argentina	Contemporary Latin America
Chile	Contemporary Latin America
China	Contemporary China
France	Contemporary Europe
Germany	Contemporary Europe
Greece	Contemporary Europe
Indonesia	Contemporary South-East Asia
Italy	Contemporary Europe

Japan	Contemporary Japan
Malaysia	Contemporary South-East Asia
Mexico	Contemporary Latin America
Russia	Contemporary Europe
South China	Chinese East Asia
Spain	Contemporary Europe
Taiwan	Chinese East Asia
Thailand	Contemporary South-East Asia
Vietnam	Contemporary South-East Asia

## In-country Study

Students with a basic level of language competence will usually follow a program of study which will continue to develop their knowledge and understanding of the host country's language and culture. Those whose level of language competence is adequate will study subjects related to the development of the contemporary society – history, economics, politics, society and culture – of the host country alongside students from that country. Those whose level of language competence and understanding of local culture is close to that of a native speaker may choose freely from a wide range of subjects with the approval of the host university and the Institute for International Studies.

Where students have reached an appropriate level of language competence, arrangements may be made to substitute one or two semesters of industrial experience for periods of In-country Study. In-country industrial experience undertaken in this way will be assessed by UTS in a manner similar to subjects of In-country Study, though through cooperation between the Institute for International Studies and the School of Computing Sciences.

## Course program

For details of International Studies subjects, students should refer to the 'Subject descriptions' section in this handbook.

### Year 1

#### Autumn semester

31414	Information Systems	6cp
31415	Principles of Software Development A	6cp
31416	Computer Systems Architecture	6cp
31417	Computing Practice	6cp

#### Spring semester

31424	Systems Modelling	6cp
31425	Principles of Software Development B	6cp
31428	Quantitative Modelling	6cp
31429	Procedural Programming	6cp

### Year 2

#### Autumn semester

31434	Database Design	6cp
50140	Comparative Social Change	8cp
971xxx	Language and Culture 1	8cp
	Computing Science elective	6cp

#### Spring semester

31436	Systems Software and Networks	8cp
972xxx	Language and Culture 2	8cp
	Computing Science elective	6cp

### Year 3

#### Autumn semester

31444	Systems Design and Development	10cp
973xxx	Language and Culture 3	8cp
	Computing Science elective	6cp

#### Spring semester

22615	Accounting Information Systems	6cp
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

31455	Software Development Case Study	6cp
31698	Industrial Training	0cp

#### Spring semester

31455	Software Development Case Study (cont.)	6cp
31698	Industrial Training	0cp
31454	Project Management and the Professional	6cp

### Year 6

#### Autumn semester

31464	Information Technology Planning and Design	6cp
31699	Industrial Training	0cp
	Computing Science elective	6cp

#### Spring semester

31699	Industrial Training	0cp
	Computing Science elective	12cp

## Arrangements for In-country Study

In general, students may expect that no additional costs will be incurred through following a period of In-country Study as part of this degree program. The two semesters of

In-country Study are full-credit subjects at UTS for which HECS is payable. There are, however, no further tuition fees and the Institute for International Studies will provide travel subsidies. Students in receipt of Austudy in Australia are also able to receive it while they are engaged in In-country Study.

Some of the countries targeted in the International Studies program are relatively 'high-cost'. Though the Institute for International Studies will assist students enrolled in a period of In-country Study in one of those countries with their costs, it cannot guarantee to meet all additional costs. In such cases, students need to be prepared to shoulder a proportion of the costs themselves. Japan is the most obvious case in point.

Under normal circumstances, students can only proceed to a period of In-country Study within the International Studies program if they have successfully completed all earlier stages in the degree program. Students who have not successfully completed all earlier stages may only proceed to a period of In-country Study under exceptional circumstances and with the permission of both the Dean of the Faculty and the Director of the Institute for International Studies.

Before students leave UTS to engage in a period of In-country Study within the International Studies program, they may be required to meet appropriate financial and enrolment requirements by the Director of the Institute for International Studies. They will also be required to agree to be governed by the Institute's code of good conduct during their period of In-country Study.

## Bachelor of Science in Computing Science/ Bachelor of Laws

- ◆ *Course code: LL06*
- ◆ *Testamur title: Bachelor of Science in Computing Science/Bachelor of Laws*
- ◆ *Abbreviation: BSc LLB*
- ◆ *Course fee: HECS*

The BSc LLB is offered jointly with the Faculty of Law. The course is of five years' duration and is offered only on a full-time basis (although students will be expected to attend some evening lectures). The program will allow students the option of undertaking a legal practice major as part of their undergraduate studies.

The course will be submitted to the Australian Computer Society as satisfying the requirements of the Society for admission at the professional level.

Students enrol with the Faculty of Law, and are required to complete a total of 240 credit points, 94 in Computing Science and 146 in Law. In addition, students must complete a period of Industrial Training before graduation, ideally in a legal environment.

Students will be awarded **two** degrees and therefore will receive **two** testamurs on graduation. Students who elect not to complete the joint degree may be permitted to complete a Bachelor of Science in Computing Science or a Bachelor of Laws as a stand-alone degree.

The Faculty of Law administers the course. The current program is shown below. For full details of Law subjects, students should consult the *2000 Faculty of Law Handbook*. Inquiries should be directed to the Faculty of Law on (02) 9281 2699.

### Course program

#### Year 1

##### Stage 1

31415	Principles of Software Development A	6cp
31417	Computing Practice	6cp
70105	Legal Research	4cp
70113	Legal Process and History	10cp

##### Stage 2

31425	Principles of Software Development B	6cp
31429	Procedural Programming	6cp

70211	Law of Contract	8cp
70217	Criminal Law	6cp

## Year 2

**Stage 3**

31414	Information Systems	6cp
31416	Computer Systems Architecture	6cp
70311	Law of Tort	8cp
70616	Federal Constitutional Law	8cp

**Stage 4**

31424	Systems Modelling	6cp
31428	Quantitative Modelling	6cp
70317	Real Property	8cp
70318	Personal Property	4cp

## Year 3

**Stage 5**

31434	Database Design	6cp
31436	Systems Software and Networks	8cp
70417	Corporate Law	8cp
70617	Administrative Law	8cp

**Stage 6**

31444	Systems Design and Development	10cp
70516	Equity and Trusts	8cp
76xxx	Law elective subject 1	6cp

## Year 4

**Stage 7**

31455	Software Development Case Study <sup>1</sup>	6cp
71005	Practice and Procedure	4cp
71216	Law of Evidence	6cp
76xxx	Law elective subject 2	6cp
76xxx	Law elective subject 3	6cp

**Stage 8**

31464	Information Technology Planning and Design <sup>1</sup>	6cp
31455	Software Development Case Study (cont.) <sup>1</sup>	6cp
71116	Remedies	6cp
76xxx	Law elective subject 4	6cp

## Year 5

**Stage 9**

31454	Project Management and the Professional Industrial Training	8cp 0cp
-------	---	------------

**Stage 10**

Practical Legal Training or four Law electives	24cp
--	------

<sup>1</sup> These subjects may be replaced by Computing Science electives with the approval of the Head of School of Computing Sciences.

## Double degree in Business and Computing Science

*Bachelor of Business*

- ◆ Course codes: B01C (City campus); B01K (Kuring-gai campus)
- ◆ Testamur title: Bachelor of Business
- ◆ Abbreviation: BBUS
- ◆ Course fee: HECS

*Bachelor of Science in Computing Science*

- ◆ Course code: MC02
- ◆ Testamur title: Bachelor of Science in Computing Science
- ◆ Abbreviation: BSc
- ◆ Course fee: HECS

Students initially enrol in the Bachelor of Business degree and take the 'Programming and Design' sub-major offered by the School of Computing Sciences. On satisfactory completion of the Business degree and the 'Programming and Design' sub-major, students may then apply for admission to the Bachelor of Science in Computing Science degree. If admitted, students will receive exemptions for the computing core subjects they completed in the Programming and Design sub-major. They will also receive 24 credit points of exemptions for electives, the equivalent of a Business sub-major in the Computing Science degree.

Students considering this double degree should talk to an academic advisor in the School of Computing Sciences before beginning the sub-major.

Full details of the Bachelor of Business degree are contained in the 2000 *Faculty of Business Handbook*. For full details of the Bachelor of Science in Computing Science refer to page 65.

## Bachelor of Science (Honours) in Computing Science

- ◆ Course code: MC08
- ◆ Testamur title: Bachelor of Science (Honours) in Computing Science
- ◆ Abbreviation: BSc(Hons)
- ◆ Course fee: HECS

This program will be offered in two forms. The first is an extension of the BSc (Computing Science). The degree will have a total of 168 credit points. Students will initially enrol in the standard BSc (Computing Science) and be invited to join the Honours program at the end

of the second year. They will then complete a total of 120 credit points of Pass degree subjects and 48 credit points of Honours subjects as outlined below. Full-time students will be able to complete the Honours program in four years, part-time students in seven years. These students will receive one testamur on completion of the program.

The second form of Honours will be as a 48-credit-point program for students with pass degrees in computing from other universities or other appropriate programs within UTS. These students will be able to take the degree over one year full time or two years part time, and will receive this degree as a separate testamur.

The aim of the Honours program is to provide students with a sound research methodology and the experience of undertaking a major research-oriented project; to provide for the in-depth study of particular topics in information technology; and to provide students with a basis for postgraduate research or a career in industrial research and development.

## Program – version integrated with existing BSc

### Recommended full-time program

#### First and second years

As for existing BSc (Computing Science)

#### Year 3

##### *Autumn semester*

31696	Industrial Training	
31945	Introduction to Computing Research	6cp
31948	Honours Seminar 1	6cp

##### *Spring semester*

31697	Industrial Training	
31946	The Computing Literature	6cp
31949	Honours Seminar 2	6cp

#### Year 4

##### *Autumn semester*

31454	Project Management and the Professional	6cp
31455	Software Development Case Study	6cp
31947	Honours Research Project	12cp

##### *Spring semester*

31455	Software Development Case Study	6cp
31464	Information Technology Planning and Design	6cp
31947	Honours Research Project (subject continues)	12cp

## Recommended part-time program

### First to fourth years

As for existing BSc (Computing Science)

#### Year 5

##### *Autumn semester*

31455	Software Development Case Study	6cp
31945	Introduction to Computing Research	6cp
31698	Industrial Training	

##### *Spring semester*

31455	Software Development Case Study	6cp
31948	Honours Seminar 1	6cp
31698	Industrial Training	

#### Year 6

##### *Autumn semester*

31454	Project Management and the Professional	6cp
31949	Honours Seminar 2	6cp
31699	Industrial Training	

##### *Spring semester*

31464	Information Technology Planning and Design	6cp
31946	The Computing Literature	6cp
31699	Industrial Training	

#### Year 7

##### *Autumn semester*

31947	Honours Research Project	12cp
-------	--------------------------	------

##### *Spring semester*

31947	Honours Research Project (subject continues)	12cp
-------	--	------

## Program – Stand-alone

### Full-time version

#### Year 1

##### *Autumn semester*

31945	Introduction to Computing Research	6cp
31946	The Computing Literature	6cp
31947	Honours Research Project	12cp

##### *Spring semester*

31948	Honours Seminar 1	6cp
31949	Honours Seminar 2	6cp
31947	Honours Research Project (subject continues)	12cp

**Part-time version****Year 1****Autumn semester**

31945	Introduction to Computing Research	6cp
31948	Honours Seminar 1	6cp

**Spring semester**

31946	The Computing Literature	6cp
31949	Honours Seminar 2	6cp

**Year 2****Autumn semester**

31947	Honours Research Project	12cp
-------	--------------------------	------

**Spring semester**

31947	Honours Research Project (subject continues)	12cp
-------	---	------

Similar arrangements will exist for the two combined degrees BSc (Computing Science)/LLB and BSc(Computing Science)/BA (International Studies) and the double degree with Business.

**Honours electives**

The Honours electives may be offered specifically to Honours students in the School, may be drawn from subjects in the Master of Science in Computing (by coursework) or other postgraduate-level programs, or may be drawn from the Honours program at, say, the University of Sydney. Students will tailor the elective program to their needs and are not restricted to the above sources. A list of available Honours electives will be issued each year to eligible students.

**Progression rules**

Any student who fails any Honours subject will not be allowed to receive an Honours award. Students combining Honours with the BSc (Computing Science) will be considered for the Pass degree; students doing a stand-alone Honours program will have to show cause as to why they should not be excluded.

**Industrial experience and Honours**

To meet the objectives of the proposed Honours program within four full-time academic years, it will be necessary for Honours students to undertake 24 credit points of Honours methodology and elective subjects while they are doing their Industrial Training, normally as two 6-credit-point subjects per semester. However, students who are

anticipating enrolling in Honours will be encouraged to choose research-oriented Industrial Training where possible. Part-time students will have to complete the Honours project during a seventh year to complete the Honours program. All specific Honours subjects will be run at night, or possibly in intensive mode, perhaps during break periods to cater for both full- and part-time students.

It is expected that most full-time students will have finished the non-project requirements of the Honours program by the end of the Industrial Training year. The project will be spread over two semesters for all students.

**Grading of Honours**

Grading of Honours will be based on the Honours program alone. It is anticipated that there will be an external assessor.

**Bachelor of Computing**

- ◆ *Course code: MC06*
- ◆ *Testamur title: Bachelor of Computing*
- ◆ *Abbreviation: BComp*
- ◆ *Course fee: HECS*

The Bachelor of Computing is open only to students who do not have Australian-resident status. It is full-fee paying. It provides a three-year full-time course of academic study. Students may commence either semester. Its aims are to provide international students with a sound appropriate education in computing and information systems and to foster international links for the School of Computing Sciences.

**Selection of students**

Students will apply through International Programs, but will be assessed by the School. Students will be required to have at least the equivalent of a NSW HSC matriculation, and to meet or better the University's IELTS criteria.

**Exemptions**

Exemptions may be granted on the basis of recent academic study (within the last three years) at post-secondary level. Students must be able to demonstrate that the knowledge is current. Exemptions from core subjects may be granted where subjects successfully completed previously coincide with BComp subjects. Students are expected to apply for exemptions for which they believe they are

eligible at the commencement of their first year of study. Exemptions are usually processed by the School immediately following enrolment.

### Course program

It is likely that there will be some changes to the program in 2000.

#### Year 1

##### Semester 1

31515	Introduction to Australian IT Industry	6cp
31507	Australian IT Industry	6cp
31417	Computing Practice	6cp
31414	Information Systems	6cp

##### Semester 2

31424	Systems Modelling	6cp
31508	Programming Fundamentals	6cp
31509	Computer Fundamentals	6cp
31425	Principles of Software Development B	6cp

#### Year 2

##### Semester 3

31434	Database Design	6cp
31429	Procedural Programming	6cp
31510	Operational Systems	6cp
	Elective 1	6cp

##### Semester 4

31511	Systems Design	6cp
31512	Networking 1	6cp
31428	Quantitative Modelling	6cp
	Elective 2	6cp

#### Year 3

##### Semester 5

31454	Project Management and the Professional	6cp
22615	Accounting Information Systems	6cp
	Elective <sup>1</sup>	
	or	
31514	Computing Theory	6cp
	Elective 3	6cp ✓

##### Semester 6

31464	Information Technology Planning and Design	6cp
	Elective <sup>1</sup>	
	or	
31514	Computing Theory	6cp
31931	Software Quality Assurance	6cp
	Elective 4	6cp

<sup>1</sup> These electives will be taken from the School of Computing Sciences.

**Notes:** The subject Computing Theory will only be offered in one semester each year. If, for example, it is offered in Autumn, students in an Autumn intake will take it in their fifth semester, and students who start in Spring will take it in their sixth semester.

The elective subjects (a total of 24 credit points) may be taken from any of the School of Computing Sciences electives for which students have the prerequisites, or the students may take one of a small set of approved sub-majors from other schools and faculties. These have not been fully identified, but sub-majors such as International Finance or International Management are envisaged.

## Bachelor of Computing/ Bachelor of Arts in International Studies

- ◆ Course code: MC07
- ◆ Testamur title: Bachelor of Computing/  
Bachelor of Arts in International Studies
- ◆ Abbreviation: BComp BA
- ◆ Course fee: HECS

This course is available only to international students. It combines the Bachelor of Computing with the University's Bachelor of Arts in International Studies. Students follow the Australia and the Asia-Pacific Region major in the BA in International Studies. For details about the latter course, please see the section in this handbook on the Bachelor of Science in Computing Science/Bachelor of Arts in International Studies. The details of the Australia and the Asia-Pacific Region major can be found in the 2000 *Institute for International Studies Handbook*.

# POSTGRADUATE COURSES

---

General inquiries should be directed to either the University Graduate School, telephone (02) 9514 1523, or the Faculty's Graduate Administration Officer, telephone (02) 9514 1806. Applicants for research degrees should discuss their proposed research with either the Director, Postgraduate Studies, or their chosen supervisor before submitting applications. The Faculty's Graduate Administration Officer can assist applicants in contacting members of staff and in completing the application form.

## POSTGRADUATE RESEARCH DEGREES

### Research areas

Areas of particular interest for work towards research degrees in the School of Computing Sciences include:

- computer graphics, image processing
- computer performance evaluation
- computer-supported cooperative work
- distributed and object databases
- distributed multimedia
- distributed systems
- information processing strategy, systems management
- local networks and network interface technology
- logic in computer science
- machine intelligence, knowledge-based systems
- neural networks
- object technology
- parallel processing and transputers
- quality of systems and software
- semantics and design of programming languages
- usability of systems and software

### Computing Sciences research laboratories

Within the School, a wide range of information technology research is supported by a variety of research laboratories. Graduate research students, academics, visiting researchers and research assistants undertake collaborative research within these laboratories. The quality and relevance of research in the laboratories is enhanced by well-established links, both with industry and with overseas research institutions.

The major laboratories are:

**Parallel Processing Laboratory** – examines and applies transputer technology to real-world tasks, distributed operating systems and compilation. The laboratory has a configuration of over 40 transputer systems (contact: Ury Szewcow).

**Computer Graphics Laboratory** – using seven Silicon Graphics workstations, this laboratory is concerned with the development of realistic images and computer animation. Other areas include efficient contour algorithms, human movement, image animation and textual modelling (contact: Dr Kevin Suffern).

**Cooperative Systems Laboratory** – focuses on the implementation and data modelling of distributed databases, client-server computing, cooperative workgroup systems, the development of methods for integrating databases with expert systems, the modelling of constraints, the development of design tools and the integration of groupware with databases (contact: Dr George Feuerlicht or Professor Igor Hawryszkiewicz).

**Software Research Laboratory** – includes three groups:

*Algorithms and Languages Group* – investigates programming languages and paradigms, logic in computer science, database theory, concurrency, software engineering and formal methods, and category theory (contact: Dr Barry Jay or Dr Ron van der Meyden).

*Artificial Intelligence Group* – interests include AI in design, case-based reasoning, cognitive modelling, knowledge engineering, PROLOG and LISP (contact: Professor John Debenham).

*Adaptive Methods Group* – applies neural networks, genetic programming and other machine-learning methods to problems of varying complexity, including image analysis, forecasting and natural language (contact: Dr Tom Osborn).

**CRC Distributed Systems Technology Laboratory** – the primary focus is on management security and performance for controlled and efficient access to the resources of distributed systems such as databases, collaboration software and distributed software tools (contact: Professor Michael Fry).

**Distributed Multimedia Laboratory** – examines technology, protocols and implementation issues for very high-bandwidth multimedia technology over computer networks. Work includes distance interaction of design, editing and performance groups and network traffic performance, supporting diverse components (contact: Professor Michael Fry).

**Usability Laboratory** – investigates the methods and measurement techniques for developing effective and usable human-computer interaction methods for different kinds of operating environments, including design and system development (contact: Dr Toni Robertson).

## Doctor of Philosophy

- ◆ *Course code: MC54*
- ◆ *Testamur title: Doctor of Philosophy*
- ◆ *Abbreviation: PhD*
- ◆ *Course fee: tba<sup>1</sup>*

The Doctor of Philosophy (PhD) is intended for students who wish to pursue research at the highest level. Such research is expected to demonstrate significant originality and make a substantial contribution to computing knowledge. For specific areas of interest in research work in the School of Computing Sciences, refer to the 'Research areas' section.

<sup>1</sup> Fees will be levied in accordance with University policies and DETYA guidelines. Details will be available in early 2000.

### Attendance pattern

The Doctor of Philosophy degree is available on both a full-time and a part-time basis. The normal duration of enrolment is three years for full-time attendance and six years for part-time attendance. Candidates who already possess a degree at the Master's level may be

permitted to complete their PhD in two years of full-time research, or three years of part-time research. The maximum duration of enrolment is five years for full-time students and seven-and-a-half years for part-time students.

The School of Computing Sciences has a strong preference for research work that proceeds at a full-time pace. This preference should not be seen as a deterrent to those students who wish to remain in employment. Students who are working in a full-time job are encouraged to select a topic for their research which is closely aligned with their professional work. Once such a topic has been selected, the School usually requires that the student's employer provide a statement to the effect that at least half of the student's working week will be devoted to work which is directly relevant to the research. The student is then expected to contribute some of his or her own time to the project so that the total number of hours devoted to research is that expected of full-time attendance.

### How to apply

Application forms for all postgraduate courses may be obtained from the UTS Information Service. Applicants should hold a First Class or Second Class (Division 1) Honours degree with a major computing component, or a Master's degree in an appropriate area, or have previously undertaken other postgraduate studies in computing. Prospective applicants are expected to have developed interests in a specific area of research, and should have one or more outline proposals for research work in that area. Before submitting a formal application for admission to this degree course, applicants should first seek the approval of the School for their proposed research work. To gain this approval, applicants should initially:

*Either* send a summary proposal of approximately 1,000 words to the Director, Postgraduate Studies, School of Computing Sciences, containing references to seminal works in the area of proposed research. If the proposal is appropriate for the School, the Director will then refer the applicant to a suitable member of staff for further detailed discussion;

*or* approach a suitable member of the School's academic staff directly and discuss the proposed research area.

All Doctor of Philosophy students at UTS are required to have at least two supervisors for their research work, one of whom should be

an academic staff member of the University and, normally, one of whom should hold a Doctoral degree. Of the two supervisors, one will be the principal supervisor and the other the co-supervisor.

Prospective applicants should seek agreement from a member of the School's academic staff to act as a (principal) supervisor for the proposed research if the application is successful. Once this agreement has been obtained, applicants may then apply formally for admission by completing an Application for Candidature – Doctoral Degrees form and the Faculty's Supplementary Doctoral Application form. These forms must be signed by the applicant, the proposed supervisor and the Head of School.

### Progress reports

All Doctor of Philosophy students are required to submit, in consultation with their supervisors, a progress report at the end of each semester. The University Graduate School contacts each student and their supervisor/s to initiate this process. Students are also required to complete a Doctoral Assessment and seminar.

### Submission of thesis

All candidates for the degree of Doctor of Philosophy should give the Registrar two months' written notice of intention to submit their written thesis. Appropriate forms and the information brochure *Presentation and Submission of Theses for Higher Degrees* are available from the University Graduate School.

## Master of Science

- ◆ *Course code:* MC51
- ◆ *Testamur title:* Master of Science
- ◆ *Abbreviation:* MSc
- ◆ *Course fee:* tba<sup>1</sup>

The Master of Science degree enables graduates to extend and deepen their knowledge of a specialised area in computing by undertaking research under the supervision of a member of the academic staff. For specific areas of interest in research work in the School of Computing Sciences, refer to the 'Research areas' section.

### Attendance pattern

This degree is available on both a full-time and a part-time basis. The normal duration of enrolment for this degree is two years for full-time attendance or three years for part-time attendance. The maximum time to complete the course is three years for full-time students and four-and-a-half years for part-time students.

The School of Computing Sciences has a strong preference for research work that proceeds at a full-time pace. This preference should not be seen as a deterrent to those students who wish to remain in employment. Students who are working in a full-time job are encouraged to select a topic for their research which is closely aligned with their professional work. Once such a topic has been selected, the School usually requires that the student's employer provide a statement to the effect that at least half of the student's working week will be devoted to work which is directly relevant to the research. The student is then expected to contribute some of his or her own time to the project which brings the total number of hours devoted to research within that expected of full-time attendance.

### How to apply

Application forms for all postgraduate courses may be obtained from the UTS Information Service. Applicants should hold a First Class or Second Class (Division 1) Honours degree with a major computing component, or have previously undertaken other postgraduate studies in computing. Prospective applicants are expected to have developed interests in a specific area of research, and should have one or more outline proposals for research work in that area. Before submitting a formal application for admission to this degree course, applicants should first seek the approval of the School for their proposed research work. To gain this approval, applicants should initially:

**Either** send a summary proposal of approximately 1,000 words to the Director, Postgraduate Studies, School of Computing Sciences, containing references to seminal works in the area of proposed research. If the proposal is appropriate for the School, the Director will then direct the applicant to a suitable member of staff for further detailed discussion;

**or** approach a suitable member of the School's academic staff directly and discuss the proposed research area.

<sup>1</sup> Fees will be levied in accordance with University policies and DETYA guidelines. Details will be available in early 2000.

Every Master of Science student at UTS is required to have at least two supervisors for their research work, one of whom should be an academic staff member of the University. Of the two supervisors, one will be the principal supervisor and the other the co-supervisor.

Prospective applicants should seek agreement from a member of the School's academic staff to act as a supervisor for the proposed research if the application is successful. Once this agreement has been obtained, applicants may then apply formally for admission by completing an Application for Admission – Graduate Courses form and the Faculty's Details of Proposed Study form. These forms must be signed by the applicant, the proposed supervisor and the Head of School.

### Progress reports

All thesis students are required to submit, in consultation with their supervisors, a progress report at the end of each semester. The University Graduate School contacts each student and their supervisor/s to initiate this process.

### Submission of thesis

Each candidate for the degree of Master of Science should give the Registrar two months' written notice of their intention to submit their written thesis. Appropriate forms and the information brochure *Presentation and Submission of Theses for Higher Degrees* are available from the University Graduate School.

## POSTGRADUATE COURSEWORK PROGRAMS

### Master of Science in Computing

- 
- ◆ *Course code:* MC53
  - ◆ *Testamur title:* Master of Science in Computing
  - ◆ *Abbreviation:* MSc
  - ◆ *Course fee:* \$200 per credit point<sup>1</sup>
- 

The Master of Science in Computing is a professional course. Graduates select a program of study that suits their individual career goals. For example, a program may be chosen which develops specialised expertise in computer systems, which provides a general update of information systems or which equips the student for a position in management.

### Attendance pattern

The course may be taken on a part-time basis over six semesters or three years, or on a full-time basis of three semesters or approximately 18 months. Lectures are normally given only in the evenings and attendance is required at least two evenings per week between 6.00 p.m. and 9.00 p.m.

### How to apply

Applicants for the Master of Science (by coursework) in Computing should have a Bachelor's degree with a major in computing, or a Bachelor's degree plus a Graduate Diploma in computing, or a Bachelor's degree plus at least three years' full-time (or equivalent) professional computing experience.

As a guide, the level of the applicant's professional knowledge should be at least equivalent to that of a Level 3 Member of the Australian Computer Society.

An applicant with insufficient formal qualifications in computing may be required to register as a Master's Qualifying Student.

---

<sup>1</sup> The Master of Science in Computing is offered with a fixed quota of student places and the course fees have been set in accordance with University policy. For students commencing in 2000, tuition fees will be set at \$200 per credit point; students normally take 12 credit points per semester. Course fees are revised from year to year in accordance with University and government policy. Details of the current fee structure may be obtained from the University Graduate School.

Progression to registration as a Master of Science Student would then depend on whether the results achieved in the Qualifying Program are of the standard specified in the offer of a place as a Master's Qualifying Student. Applicants with insufficient formal qualifications should submit evidence to the effect that the level of their knowledge of computing is equivalent to that described above.

Criteria for admission to the Master of Science (by coursework) in Computing support the University's Equal Opportunity policy.

Each semester the School publishes the *MSc in Computing (by coursework) Course Guide*. This Course Guide contains much administrative information as well as a detailed statement of the course regulations. Students and prospective applicants are advised to obtain a copy of the Course Guide and to study it carefully. From August each year, an 'Admission package' containing a copy of the Course Guide, the application forms and other relevant information is available from the UTS Information Service. Please note that completed application forms must be submitted to the University by the published deadline, which is usually the last week of October in the year prior to that in which admission is sought. Applicants may be required to attend an interview.

### Prerequisite knowledge

All subjects in the Master of Science in Computing course are presented at the postgraduate level. Students are expected to be familiar with the undergraduate material that lies behind the postgraduate work.

For the subjects offered by the School of Computing Sciences, before the start of each semester a set of references to the presumed undergraduate material is given by each lecturer. It is important to note that these references are not 'pre-reading', but are a summary of the undergraduate knowledge required for each subject. Students are responsible for ensuring that they are completely familiar with the undergraduate knowledge implied by those references. If they are not, then they should defer their enrolment in that subject and should attend suitable remedial undergraduate lectures as advised by the Director, Postgraduate Studies.

For a subject offered by other faculties or schools other than the School of Computing Sciences, students are advised to contact that subject's coordinator before the start of

semester, to determine whether they possess the prerequisite knowledge for that subject. If students do not possess the prerequisite knowledge, they should seek advice from those schools or faculties on the feasibility of a remedial program. The Director, Postgraduate Studies, will assist in obtaining this advice.

### Course structure

To complete the course, students must obtain 72 credit points. Most coursework subjects are six credit points each. Students will normally complete 60 credit points of coursework subjects and 12 credit points of project subjects. There is a wide choice of subjects offered by the School of Computing Sciences and by other faculties including Business and Engineering. Students may obtain up to 24 of their credit points by passing approved subjects from outside the School of Computing Sciences.

Students select their program of study with the assistance of an advisor from the School of Computing Sciences. The subjects chosen by a student should form a coherent plan of study and be consistent with the student's professional career goals. The program of study may be a broad collection of subjects or a series of streams for those who wish to study certain areas in more depth. The underlying theme is information technology in a distributed environment. The subjects offered in this program are revised regularly to preserve the currency of the course.

### Admission

#### Exemptions

Exemption from subjects in the MSc program is not given on the basis of previous study. Some exemptions are granted to students who are undertaking joint qualifications at the University of Technology, Sydney.

#### Joint MSc/MBA

Under an agreement between the Faculty of Mathematical and Computing Sciences and the Faculty of Business at UTS, students who wish to complete *both* the MSc (by coursework) in Computing *and* the MBA degrees are granted exemption from some of the subjects in these two degrees.

Graduates from the University's MBA program would, if admitted to the MSc, be granted exemption from the Faculty of Business electives which could form part of the program of study for the MSc in Computing.

In this case, the regulations outlined in the section 'Course description: General' are modified as follows:

- The student must gain 36 credit points by passing MSc subjects offered by the School of Computing Sciences.
- The student must complete 12 credit points of project work which should be closely related to the student's program of study.

Students entering the MSc program, who intend to apply subsequently for admission to the University's MBA program, should first discuss the matter both with the MSc Coordinator and the Director of the MBA program in the Faculty of Business, preferably *before* they commence their studies for the MSc.

### MSc Subjects

The MSc subjects are as follows. Each MSc subject is of one semester's duration. There are three semesters in a year. In what follows: 'A' stands for Autumn semester, 'S' stands for Spring semester, 'U' stands for Summer semester. Also 'B' stands for block mode meaning that the subject is presented in a semi-intensive format; for example, attendance may involve a whole weekend. Not all subjects are presented each year. They are dependent on the availability of specialist lecturing staff and sufficient interest in a subject from students. Some of the MSc subjects have prerequisites.

Subject Number	Subject Name	Credit Points	Semester Offered
32546	Business Process Engineering	6	A
32910	Project 1	6	all
32911	Project 2	6	all
32536	Systems Development (Objects and Processes)	6	A
32108	Applications of Artificial Intelligence	6	S
32204	Advanced Data Management	6	A
32208	Information Processing Strategy	6	S
32535	Databases in Distributed Environments	6	S
32531	Global Information Systems	6	A
32532	Conducting Business Electronically	6	S
32533	Networking Communities	6	A
32534	Knowledge Management	6	S
32537	Enterprise Wide Software Systems	6	S
32545	Multi-Agent Systems	6	S
32604	Systems Integration	6	S
32541	Project Management	6	A
32702	Contemporary Telecommunications	6	S

Subject Number	Subject Name	Credit Points	Semester Offered
32520	UNIX Systems Administration	6	A
32521	Internetworking	6	A
32523	Operating Systems for Internetworking	6	A
32524	LANs and Routing	6	S
32525	Distributed Software Programming	6	S
32527	Internetwork Design	6	S
32528	Network Management	6	S

**Note:** Prerequisite: must satisfy admission requirements for the Master of Science in Internetworking course, and subject to space being available.

Subject Number	Subject Name	Credit Points	Semester Offered
32704	Strategic IT Contract Management	6	B

**Note:** Prerequisite: must satisfy admission requirements for the Master of Business in Information Technology Management course, and subject to space being available.

Subject Number	Subject Name	Credit Points	Semester Offered
95560	Multimedia Industry and Process	6	A & S
95561	Multimedia Products and Technology	6	A & S

**Note:** Prerequisite: must satisfy admission requirements for the Master of Interactive Multimedia course, and subject to space being available.

At present the intention is to offer the above MSc subjects on a two-year cycle, however the Masters program is constantly under review. The list of MSc subjects offered is expected to expand. The contents and sequence of existing MSc subjects may be revised to reflect changes in the area.

### Elective subjects

The elective subjects in the proposed course will present specialised material and will thus depend on the availability of specialist staff and on a student meeting the prerequisites. These elective subjects usually share lectures with senior undergraduate students. The following elective subjects will be available but not in every semester; the School timetable shows the availability of elective subjects each semester.

32501	Computer Graphics	6cp
32509	Human-Computer Interaction in Information Systems	6cp
32511	Principles of Object-oriented Programming in Smalltalk	6cp
32513	Advanced Machine Learning	6cp
32516	Internet Programming	6cp
32517	Commerce on the Internet	6cp
32530	Building Intelligent Agents	6cp
31921	Objectbases	6cp
31601	Programming for Performance	6cp
32542	Advanced Cognitive Modelling	6cp

### Subjects from other schools or faculties

Postgraduate subjects from the School of Mathematical Sciences or the Faculties of Law and Business are available to students in the MSc in Computing as electives. Students should contact the relevant school or faculty for prerequisites.

## Choosing a program in 2000

Students will be issued with a Master's handbook which will detail suggested subject patterns and themes, and when individual subjects will be available. These will also be available in the more up-to-date version of the online edition of this handbook.

## Project

The project entails a substantial investigation of a topic, in an area of current research interest in information technology. The project should be related to the student's professional career goals. Students are required to enrol in and pass the two project subjects: 32910 Project 1 and 32911 Project 2. The project work is normally undertaken in the final two semesters of study. In the first semester of project work, students enrol in Project 1. In the second semester of project work, students enrol in Project 2. Students should be enrolled in the Project 2 subject in the semester in which they submit their written report.

The topic for the project should be:

- of direct interest to the student, and
- of value to the student's professional development.

The topic for the project may be closely related to the student's current employment. Alternatively, the topic may be chosen to be of value to the student's future career. The project should be a vehicle for importing the knowledge learned from the coursework to the student's professional life. The topic should be chosen with this professional goal in mind. Students must:

- obtain the agreement of a member of the lecturing staff to act as project supervisor, and
- deliver a 500-word description of the project to the MSc Coordinator for approval.

The two outputs of the project work are:

- a *written report*, and
- a verbal *research seminar*.

The dates for submitting the two outputs of the project work are:

- the due date for submitting the *written report* is 31 May if the student wishes to be certain that the project will be examined in the Autumn semester. The corresponding date for the Spring semester is 31 October. In any case, the examination of the written report must be completed before the School's Examination Review Committee meeting for that semester. This meeting takes place near the end of each semester. If a student submits the written report after the due date and if the examination of the written report has not been completed in time for that meeting, then a 'fail' result will be recorded for that student's project work.
- the *research seminar* is normally presented early in the semester following the submission of the written report. That is, the seminars will normally be presented by students who are not formally enrolled. The research seminars are presented at that time to avoid overloading staff and students at the end of semester. Students are advised of the date of the research seminar presentations.

The *written report* is a substantial document which describes the project work in detail. Three copies of the written report should be lodged with the MSc Coordinator in the School of Computing Sciences. All three copies of the written report will be retained by the University, one by the School of Computing Sciences, one by the Project Supervisor and one by the University Library. The written report should be typed and bound in accordance with the University's specification for Master's theses (available from either the University Graduate School or the School of Computing Sciences). To avoid the possible expense of rebinding, students are advised to submit one copy of a typed but unbound report for examination. When submitted for examination, the written report should be accompanied with a 'Certificate of Originality' and a 'Retention of Report' form. These forms are available from the office of the Faculty of Mathematical and Computing Sciences.

The *research seminar* is a 40-minute verbal presentation. The research seminars are followed by 20 minutes of discussion. Students

do not need to be formally enrolled when they present their research seminar. The aim of the research seminar is to discuss the controversial or technical issues within the written report. A 'satisfactory' or 'unsatisfactory' result will be awarded for this presentation. If a student receives an 'unsatisfactory' result for their research seminar then the student will be given the opportunity to present the research seminar again. All students are required to present a satisfactory research seminar before they will be permitted to graduate.

The project work is examined on the contents and standard of presentation of the written report and the research seminar. The examiner of the written report is usually the project supervisor. If a student disputes the marks awarded for the project work, the written report is examined by another member of the academic staff.

### Subject failure

Students are permitted, at the most, two failures during the MSc in Computing. Note the resolution of the Faculty Board, FBMC/92/70, that any Master's degree candidate enrolled in the MSc in Computing who records any three failures will have his or her registration from the course discontinued. In addition, students are bound by the Rules of the University and are advised to refer to them.

### Minimum and maximum time

There are two important University Rules concerning minimum and maximum time of which students should be aware:

- A Master's degree candidate shall not normally be eligible for the award of a Master's degree by coursework until he or she has completed at least six semesters of a part-time course. A student who is specially qualified in a relevant discipline may, with the approval of the Academic Board, be allowed to complete the course in less than the minimum time (Rule 3.3.5.2).
- A student who fails to complete all of the work prescribed for the higher degree within nine semesters from the time of his or her registration as a part-time Master's degree candidate will only be permitted to continue with the approval of the University Graduate School Board (Rule 3.3.7.1).

## Master of Business in Information Technology Management

- ◆ *Course code: MC85*
- ◆ *Testamur title: Master of Business in Information Technology Management*
- ◆ *Abbreviation: tba*
- ◆ *Course fee: \$275 per credit point or \$1,650 per subject (module)*

## Graduate Diploma in Information Technology Management

- ◆ *Course code: MC75*
- ◆ *Testamur title: Graduate Diploma in Information Technology Management*
- ◆ *Abbreviation: tba*
- ◆ *Course fee: \$275 per credit point or \$1,650 per subject (module)*

## Graduate Certificate in Information Technology Management

- ◆ *Course code: MC63*
- ◆ *Testamur title: Graduate Certificate in Information Technology Management*
- ◆ *Abbreviation: none*
- ◆ *Course fee: \$275 per credit point or \$1,650 per subject (module)*

These courses form a joint program between the School of Computing Sciences and the School of Management in the Faculty of Business. Administration of these courses is the responsibility of the School of Computing Sciences. All inquiries regarding these courses should be directed to Alison Stevens, Professional Programs Manager, on (02) 9514 1925. The courses aim to:

- develop professional skills necessary for successfully undertaking the role of manager in terms of people, resources and processes in a variety of organisational contexts (which may include business, community, public, manufacturing, consultancy or professional contexts);
- enable the acquisition of conceptual and analytical understanding of the corporate/organisational needs from the differing perspectives of individuals and groups within the organisation, necessary for successful management;
- provide a well-balanced selection of subjects from both advanced information technology (IT) and management, in an integrated program which is relevant to the current and future demands of the IT industry;
- develop an understanding of the IT business environment, and to extend knowledge and skills in specialist areas of management related to management of IT in business; and
- enhance and develop a partnership between UTS and the IT industry.

### Admission requirements

#### Master's degree

- A recognised Bachelor's degree (or equivalent) in an appropriate discipline such as Business or Computing, plus a minimum of two years' experience in the IT industry;
- or*
- the prior successful completion of the Graduate Diploma in Information Technology Management (such students will therefore be exempt from Semesters 1, 2, 3 and 4);
- or*
- the successful completion of an approved bridging program for non-graduate entry – that is, the Graduate Certificate in Information Technology Management – with passes in all subjects and a credit average over the entire course.

#### Graduate Diploma

- A recognised Bachelor's degree (or equivalent) in an appropriate discipline such as Business or Computing, plus a minimum of two years' experience in the IT industry;
- or*
- the prior successful completion of the Graduate Certificate in Information Technology Management (such students will therefore be exempt from Semesters 1 and 2), where entry to the Graduate Certificate was based on a recognised Bachelor's degree (or equivalent) in an appropriate discipline such as Business or Computing;
- or*

- the successful completion of an approved bridging program for non-graduate entry – that is, the Graduate Certificate in Information Technology Management – with passes in all subjects and a credit average over the entire course.

#### Graduate Certificate

- A recognised Bachelor's degree (or equivalent) in an appropriate discipline such as Business or Computing, plus a minimum of two years' experience in the IT industry;
- or*
- evidence of general and professional qualifications, such as other post-secondary school qualifications that can establish the applicant's aptitude, knowledge and practical experience, which will satisfy the Faculty Board in Mathematical and Computing Sciences that the applicant possesses the educational preparation and capacity to pursue postgraduate studies. (Experience in the IT industry will be especially important in this regard e.g. five years' minimum vocational experience.)

It should be noted that applicants for these courses may be required to attend an interview.

#### Presumed knowledge and prerequisites

Subjects in the Graduate Certificate, Graduate Diploma and Master's courses are presented at postgraduate level. Students are expected to be familiar with the undergraduate material on which the postgraduate work is based. For the subjects offered by either the School of Computing Sciences or the School of Management, before the start of each semester a set of references to the presumed undergraduate material is given by each lecturer. It is important to note that these references are not 'pre-reading' but are a summary of the undergraduate knowledge required for each subject. Students are responsible for ensuring that they are completely familiar with the undergraduate knowledge implied by those references. If they are not, then they should seek advice from the Director, Management Development Program (Information Technology), in the first instance and may then be advised to contact the Subject Coordinator before the start of semester, to determine whether they possess the prerequisite knowledge for that subject.

For subjects offered by faculties or schools other than the School of Computing Sciences and the Faculty of Business, students are advised to contact that subject's coordinator before the start of semester to determine whether they possess the prerequisite knowledge for that subject. If students do not possess the prerequisite knowledge, then they should seek advice from that school or faculty on the feasibility of a remedial program. The Director, Management Development Program (Information Technology), will assist in obtaining this advice.

In addition, there are prerequisite requirements within the structure of the course itself (see 'Course structure' section).

#### Course structure

All subjects will be assessed to the Master's standard, regardless of the course in which a student is enrolled. Therefore, a student who takes several individual subjects may later gain credit towards a Graduate Certificate.

The courses have been designed to allow freedom of choice at the individual subject level. The subjects at the Graduate Certificate level aim to teach the student skills and competencies for IT management. At the Graduate Diploma level, the subjects aim to focus on organisational strategies and planning. At the Master's level, the subjects are related to organisational development and research for the IT industry.

The full Master's degree course is normally completed in three years (six semesters) of part-time study. The project is normally commenced in the fifth semester, together with one subject related to research methodology.

**Core** subjects are to be offered by the Faculties of Mathematical and Computing Sciences and Business on a regular basis. Additional subjects available on an **elective** basis will be offered depending on demand and the availability of specialist staff (see 'Electives policy', below). The industrially linked project must build on the core/elective subjects already taken by the student and should ideally be related to his or her place of work.

#### Electives policy

Students may take postgraduate level subject(s) from another UTS discipline or another institution, at the discretion of the Director, Management Development Program (Information Technology). Where more than one subject is involved, the subjects would be

expected to form a coherent, staged group. The student will be expected to provide a written justification as to how the subjects form a coherent, staged group and a coherent plan of study that is consistent with their professional career goals.

The student is responsible for ensuring that they have the necessary qualifications and presumed knowledge for any subjects taken from other disciplines or institutions. Students should also be aware that such subjects may not be presented or documented at the level normally associated with the program.

Exemptions will not normally be granted to students for elective subjects. Students may commence the course in either the Autumn or Spring semester.

### Level 1 – Non-award

A student may take any number of subjects relevant to his or her professional needs. Subject prerequisites, if any, will need to be taken into account.

All subjects will be presented and assessed to the Master's level. Therefore, a student who takes several appropriate subjects may later gain credit towards a Graduate Certificate.

No formal qualification will be awarded by UTS.

### Level 2 – Graduate Certificate in Information Technology Management (24cp)

A student must complete the following **three core** subjects:

21788	Effective People Management	6cp
21789	Contemporary Management Practices	6cp
32601	Advanced Project Management	6cp

*plus one elective subject selected from*

24704	Managing Client Relations	6cp
32602	Impact of Information Technology	6cp
32604	Systems Integration	6cp
32605	Managerial Analysis and Evaluation of Information Systems	6cp
32701	Advances in Information Technology	6cp
32702	Contemporary Telecommunications	6cp
32703	Information Technology Strategy	6cp
32704	Strategic IT Contract Management	6cp

*or*

An elective approved by the Director, Management Development Program (Information Technology)

### Level 3 – Graduate Diploma in Information Technology Management (48cp)

A student must complete the requirements for the Graduate Certificate in Information Technology Management (24cp);

**plus** complete the following **two core** subjects:

21806	Managing Organisational Change	6cp
21808	Strategic Business Management	6cp

**plus** two elective subjects selected from the electives listed under Level 2 or an elective approved by the Director, Management Development Program (Information Technology) or one of the following:

21807	Total Quality and Productivity Management
25742	Financial Management
22746	Managerial Accounting
22747	Accounting for Managerial Decisions

### Level 4 – Master of Business in Information Technology Management (66cp)

A student must complete the requirements for the Graduate Diploma in Information Technology Management (48cp);

**plus** complete the following subjects:

21751	Management Research Methods	6cp
32806	Project A	6cp
32812	Project B	6cp

The major project must involve applied organisational research and development in the IT industry. It must be industrially linked and conducted in conjunction with the student's industry sponsor.

A student must make one oral presentation of his or her project work at a satisfactory standard during the final year of enrolment in the Master's course.

In all cases, the subjects chosen must form a coherent plan of study and must be consistent with the student's professional career goals. Each student's program of study will be discussed with, and approved by, the Director, Management Development Program (Information Technology) at the time of entry into a course.

### Project

The project entails a substantial investigation of a topic, in an area of current research interest in information technology and related to the student's professional career goals. The project is normally taken in the last part of the Master's course and must be taken and passed by all Master's students.

A student may wish to select a topic that is closely related to his or her current employment. Alternatively, a student may wish to choose a topic that should be of value to his or her future career. The project should be a vehicle for importing the knowledge learnt from the coursework into the student's professional life. The topic should be chosen with this professional goal in mind. Students are advised to seek the assistance of the lecturing staff in finalising the topic for their project.

## Master of Interactive Multimedia

- ◆ *Course code:* MC70
- ◆ *Testamur title:* Master of Interactive Multimedia
- ◆ *Abbreviation:* MIM
- ◆ *Course fee:* \$275 per credit point (\$1,500 per six credit point subject)<sup>1</sup>

## Graduate Diploma in Interactive Multimedia

- ◆ *Course code:* MC71
- ◆ *Testamur title:* Graduate Diploma in Interactive Multimedia
- ◆ *Abbreviation:* GradDipIM
- ◆ *Course fee:* \$275 per credit point (\$1,500 per six credit point subject)<sup>1</sup>

## Graduate Certificate in Interactive Multimedia

- ◆ *Course code:* MC72
- ◆ *Testamur title:* Graduate Certificate in Interactive Multimedia
- ◆ *Abbreviation:* none
- ◆ *Course fee:* \$275 per credit point (\$1,500 per six credit point subject)<sup>1</sup>

This is a set of articulated offerings:

- Graduate Certificate in Interactive Multimedia 22–26cp (core + 6–10cp)
- Graduate Diploma in Interactive Multimedia 48cp (core + 32cp)
- Master of Interactive Multimedia 72cp (core + 56cp)

<sup>1</sup> All fees are subject to annual review.

Initially, the courses will be offered as part-time study over one, two or three years. It is possible to do some program choices on a full-time basis. It is a fee-paying course. While the program will be managed by the School of Computing Sciences, it is a joint program between the Institute for Interactive Multimedia and a number of teaching faculties.

The program is designed for students from a wide variety of background disciplines who may or may not already be working in areas of multimedia. For this reason, the program contains a considerable number of elective subjects to enable students to gain new areas of knowledge or broaden existing areas. It has also been designed as an articulated program commencing with a Graduate Certificate, then a Graduate Diploma and finally a Master's degree. Some non-graduate entry into the Graduate Certificate only will be possible for applicants with multimedia industry experience. Successful completion of the Graduate Certificate at some appropriately defined level by such students will permit them to articulate into the Graduate Diploma.

All students will undertake a core course of study leading to the award of Graduate Certificate. This will consist of two eight-credit-point core subjects and between six and 10 credit points of elective subjects. The two core subjects will be taught by the Institute for Interactive Multimedia with some guest lecturers from other faculties. There will be no exemptions granted for these subjects.

Students will then be asked to specialise in one of the following areas: Hypermedia from Engineering, various areas in Computing, various areas in Design, Information Studies, Audiovisual Production, and Education.

The final component of the Graduate Certificate will be between six and 10 credit points of electives from one of these areas.

The Graduate Diploma consists of the Graduate Certificate plus a further 22–26 credit points of electives. This means that in total the students will do 32 credit points of electives, of which 24 will be from one of the coherent streams on offer, and the remaining eight credit points may be chosen from any of the other electives. Most of these electives are existing graduate subjects within the relevant faculties.

The third component of the program for students progressing to the Master's will be the development of a multimedia product. Students will form multidisciplinary groups for this purpose. Supervision of the final

product will be carried out by relevant staff in the faculties who have been identified as having a suitable background for each project.

Each student will plan an individual course based on the program below with the Academic Director of the program.

## Course structure

### Graduate Certificate in Interactive Multimedia

#### Core:

95560	Multimedia Industry and Process	8cp
95561	Multimedia Products and Technology	8cp
	Elective	6-10cp

### Graduate Diploma in Interactive Multimedia

#### Graduate Certificate plus:

Elective stream	22-26cp
-----------------	---------

### Master of Interactive Multimedia

#### Graduate Diploma plus:

Multidisciplinary team-based project	24cp
--------------------------------------	------

The electives will be taken from a stream designed to complement the student's existing knowledge. Current streams are from:

#### School of Computing Sciences

These electives are to give students some basic technical skills:

31429	Procedural Programming	6cp
31436	Systems Software and Networks	8cp
31904	Systems Programming	6cp
31512	Networking 1	6cp
31513	Networking 2	6cp
31927	Applications Development with Visual Basic	6cp
31876	Operating Systems Facilities	
31777	Human-Computer Interaction	6cp
32106	Object-oriented Software Development	6cp
32307	Operating Systems	6cp
32501	Computer Graphics	6cp
32516	Internet Programming	6cp
32522	C for Systems Programmers	6cp

#### Faculty of Design, Architecture and Building

These subjects are mainly in the area of design, graphics and visual communication:

81021	Communication Technology	4cp
81925	3D Computer Animation 1	4cp
81030	3D Computer Animation 2	4cp
81024	Computer Graphics 1	4cp
81923	Introduction to Design Computing	8cp
82009	Human Factors and Design	4cp
82016	Graphic Visualisation	4cp

82017	2D and 3D Communication	4cp
82915	Photography for Designers	4cp

#### Faculty of Engineering

These subjects are all in hypermedia:

49031	Information Structures, Perception and User Interface Design	6cp
49241	Hypermedia Technologies	6cp
49242	Mono Media Technologies	6cp
49243	Design of Hypermedia Information Systems	6cp

#### Faculty of Humanities and Social Sciences

Note that the Faculty of Humanities and Social Sciences is in the process of re-designing its courses, so the following subjects may change:

#### Information Studies stream

55902	Information Behaviour	6cp
55906	Organisation of Information	6cp
55907	Information Retrieval	6cp
55903	Information Production and Presentation	6cp
55910	User Documentation 1	6cp
55911	User Documentation 2	6cp
54299	NetDesign	6cp

#### Media Production stream

54116	Audiovisual Media Production	6cp
54150	Computers and Print Production	6cp
54151	Computers and Audiovisual Production	6cp
50457	Theories of the Visual	6cp
51007	Media Studies	6cp
52272	Sound, Music, Noise	6cp
52274	Sound Studies	6cp
54294	Sound Design	8cp
54101	Sound and Image	6cp
54110	Media, Culture and Society	6cp
54153	Video Basic	4cp

#### Admission requirements

Applicants should have a first degree, equivalent to a three-year undergraduate degree from the University of Technology, Sydney, and have two years of related work experience. Applicants are expected to demonstrate that they possess sound communication skills, analytical and critical skills, and knowledge of a specialty area related to the multimedia industry.

#### Exemptions

Given the interdisciplinary focus and team-work emphasis of these courses, advanced standing and subject exemptions will not normally be granted for other postgraduate study or work experience.

## Master of Science in Internetworking

- ◆ *Course code: MC80*
- ◆ *Testamur title: Master of Science in Internetworking*
- ◆ *Abbreviation: MSc*
- ◆ *Course fee: \$275 per credit point (\$1,500 per six credit point subject)<sup>1</sup>*

## Graduate Diploma in Internetworking

- ◆ *Course code: MC81*
- ◆ *Testamur title: Graduate Diploma in Internetworking*
- ◆ *Abbreviation: GradDipInternetworking*
- ◆ *Course fee: \$275 per credit point (\$1,500 per six credit point subject)<sup>1</sup>*

## Graduate Certificate in Internetworking

- ◆ *Course code: MC82*
- ◆ *Testamur title: Graduate Certificate in Internetworking*
- ◆ *Abbreviation: none*
- ◆ *Course fee: \$275 per credit point (\$1,500 per six credit point subject)<sup>1</sup>*

This is a set of articulated offerings:

- Graduate Certificate in Internetworking 24cp
- Graduate Diploma in Internetworking 48cp (24cp + Grad Cert)
- Master of Science in Internetworking 72cp (24cp + Grad Dip)

Initially, the courses will be offered as part-time study over one, two or three years. Should the demand warrant a full-time course, it may be possible to offer the Graduate Certificate, at least, over one semester full-time. It is anticipated that eventually the program will be offered in a very flexible mode. It is a fee-paying course.

<sup>1</sup> All fees are subject to annual review.

The program is designed to meet the growing needs of industry for networking specialists. It is intended for computing or engineering graduates with or without networking experience who wish to learn or extend their knowledge of networking. As students will

have a variety of backgrounds, there is a degree of subject choice in the program to meet individual's needs.

## Course structure

### Graduate Certificate in Internetworking

32516	Internet Programming	6cp
32521	Internetworking	6cp
32524	LANS and Routing	6cp
32522	C for Systems Programmers	6cp
<i>or</i>		
31904	Systems Programming	6cp

### Graduate Diploma in Internetworking

#### **Graduate Certificate plus:**

Any four of the following (total 24cp):

32520	UNIX Systems Administration	6cp
32523	Operating Systems for Internetworking	6cp
32525	Distributed Software Programming	6cp
32527	Internetwork Design	6cp
49201	Integrated Services Network	6cp
32528	Network Management	6cp

*plus*

an elective approved by the Program Director

### Master of Science in Internetworking

#### **Graduate Diploma plus:**

32518	Internetworking Research	6cp
32519	Internetworking Project	18cp
<i>or</i>		
32529	Internetworking Project	12cp
<i>plus</i>		
an elective from the Graduate Diploma list (above)		6cp

## Admission requirements

Applicants should have a first degree. A first degree in Computing Science, Computer Systems Engineering, Telecommunications or cognate discipline is an advantage but not essential.

Entry, based on experience in the networking industry, is possible. An applicants suitability for the program, in this case, will be determined by academic staff and may require an interview.

## Experience/Background

Two years experience in networking or other positions in the IT industry is desirable.

## Aim/Objective

- 1 To meet the growing needs of industry for networking specialists.

- 2 To allow the student to gain a University qualification and prepare them for CCNA (Cisco Certified Network Associate) industry certification within the UTS/ Cisco Local Network Academy.
- 3 To retrain IT professionals wishing to move into networking and internet-working.
- 4 To provide a thorough and practical grounding in networking, network design, network administration and network management.
- 5 To provide a solid foundation for the writing of networked applications using Java and other WWW technologies.
- 6 To meet students' needs through project work and elective subjects, for some specialisation, at any layer of the OSI reference model.

### Exemptions

Where a student has previously studied relevant material, it may be possible to gain advanced standing or to substitute an elective subject.

## Graduate Diploma in Information Technology

- ♦ *Course code: MC52*
- ♦ *Testamur title: Graduate Diploma in Information Technology*
- ♦ *Abbreviation: GradDipInfTech*
- ♦ *Course fee: \$200 per credit point or \$1,200 per six credit point subject (Australian citizens and permanent residents); \$13,000 per annum (International students)<sup>1</sup>*

The Graduate Diploma in Information Technology is intended to provide students with the basic knowledge and skills required for a professional career in the computing and/or information systems area. It is designed for people who have already taken a first degree in which computing has not been included, or only covered lightly.

It is anticipated that students entering the course will have previously studied courses from a wide range of disciplines. Some will have graduated with no previous contact with computing; for such, the course is essentially a re-training degree, aiming to lay the foundations for a new career in the computing and/or information systems area. Other

students entering the course will have had some familiarisation with computing, while still others will be familiar with computing concepts in areas such as programming, systems analysis and information retrieval, and will be seeking to consolidate and extend their present knowledge by attaining a formal computing qualification. It is not intended that applicants have extensive computing experience, given the re-training emphasis of the course.

Satisfactory completion of the course leads to the award of Graduate Diploma in Information Technology. It is anticipated that holders of this award will be eligible for level 1 membership of the Australian Computer Society.

<sup>1</sup> All fees are subject to annual review.

### Admission requirements

The Graduate Diploma in Information Technology may be taken on a full- or part-time basis, with an intake in either Autumn or Spring semester.

Applicants should have a first degree, equivalent to an undergraduate three-year degree from the University of Technology, Sydney. Candidates who are unsure of the exact ranking of their degree should either contact the University Graduate School on (02) 9514 1523, or write to the National Office of Overseas Skills Recognition, PO Box 25, Belconnen, ACT 2616.

The number of applicants for the Graduate Diploma is expected to be in excess of the number of places. In addition to the Application for Admission to Graduate Coursework form, applicants should complete a Supplementary Application form, and support their application with whatever documentation they consider to be appropriate. The selection committee may invite some applicants in for an interview.

For further information, applicants should contact the Faculty's Graduate Administration Officer, on (02) 9514 1806, or Peter Bebbington, Director, Graduate Education, on (02) 9514 1828.

### Attendance pattern

The course is normally taken on a part-time basis over two years, and will usually entail attending two to three evenings per week. Occasionally one afternoon per week (plus one to two evenings per week) may be required, depending on the choice of subjects. Some students may be unable to pursue the normal

attendance pattern or may wish, for some reason, to take longer to complete the course; this is allowable, but students must be aware of the University's maximum time rule which is described in the 'Progression rules' section below. The course may also be taken on a full-time basis over one year.

### Exemptions

Under normal circumstances, exemption from any core subject may be granted on the basis of equivalent study. A maximum of 12 credit points may be exempted. Students will **not** be granted exemptions from elective subjects. The Graduate Certificate in Information Technology articulates into this course.

### Progression rules

All students enrolled in this course should be aware of the following University Rules under which a student's registration will be discontinued.

#### Maximum time

Students will have their registration discontinued for failure to complete the course within four semesters from initial registration in the case of a full-time student, or within eight semesters from initial registration in the case of a part-time student. This is not inclusive of periods of approved leave of absence (Rule 3.2.6.1).

#### Unsatisfactory progress

Students will have their registration discontinued for any three failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/94/80) (Rule 3.2.6.2).

### Course structure

To gain the Graduate Diploma, students must complete a minimum of 48 credit points.

Students may commence either the full-time or part-time program in either semester.

#### Recommended part-time program

There may be some subject changes in 2000.

#### Year 1

##### Semester 1

31414	Information Systems	6cp
31509	Computer Fundamentals	6cp

##### Semester 2

	Programming subject	6cp
31424	Systems Modelling	6cp

#### Year 2

##### Semester 3

31434	Database Design	6cp
31512	Networking 1	6cp

##### Semester 4

Two Elective subjects from SoCS	12cp
---------------------------------	------

#### Recommended full-time program

##### Semester 1

31414	Information Systems	6cp
31509	Computer Fundamentals	6cp
	Programming subject	6cp
31424	Systems Modelling	6cp

##### Semester 2

31434	Database Design	6cp
31512	Networking 1	6cp
Two Elective subjects from SoCS	12cp	

**Notes:** The programming subject may be one of:

- 31508 Programming Fundamentals
  - 31415 Principles of Software Development A
  - 31429 Procedural Programming
- according to student background and interest.

Electives may be taken from subjects offered in the undergraduate programs of the School of Computing Sciences (SoCS) for which the students have the prerequisites. Students will be required to discuss elective choices with the Director of Graduate Education.

The prerequisites for the core subjects are that 31424 Systems Modelling must be taken before 31434 Database Design and 31509 Computer Fundamentals must be taken before 31512 Networking 1.

All students are permitted to take any modules they wish from the subject 31417 Computing Practice. These modules, which will not be liable for fees, will be additional to the standard course program and credit will not be given.

## Graduate Certificate in Information Technology

- ◆ *Course code:* MC67
- ◆ *Testamur title:* Graduate Certificate in Information Technology
- ◆ *Abbreviation:* none
- ◆ *Course fee:* \$200 per credit point or \$1,200 per six credit point subject

The Graduate Certificate will be offered as a full-fee-paying part-time course usually extending over two semesters. It will consist of 18 credit points. It replaces all previous general Graduate Certificates and is designed to offer flexibility to the student. It articulates into the Graduate Diploma in Information

Technology. Students who complete one Graduate Certificate will be able to carry the credit forward to the Graduate Diploma in Information Technology (GradDipInfTech).

Its aims are to provide opportunities for some computing practitioners to update their knowledge, to provide opportunities for graduates in other disciplines to commence study in Information Technology, and to provide flexibility for students in their study of computing subjects.

As explained above, the Graduate Certificate will consist of three six-credit-point subjects, for a total of 18 credit points. Some combinations of subjects are shown below, with indications of expected times to complete them. In addition, applicants will be able to choose other combinations from the undergraduate subjects offered by the School of Computing Sciences, subject to the approval of the Director of Graduate Education. Approval will involve consideration of such aspects as prerequisite structures, subject timetables and the student's interest.

## Admission requirements

Applicants with a recognised Bachelor's degree (or equivalent) are normally deemed eligible for the course. Consideration may be given to applicants whose background does not fit this requirement, provided that a case can be made to establish that their aptitude, knowledge and practical experience are sufficient. Experience in the information technology industry is especially important in this regard.

## Maximum time rule

Students will have their registration discontinued for failure to complete the course in three semesters from the time of registration in the case of part-time students, not inclusive of periods of leave of absence (Rule 3.2.6.1).

## Unsatisfactory progress

Students will have their registration discontinued for any two failures in the course (unsatisfactory progress as defined by the Faculty Board resolution, FBMC/94/80) (Rule 3.2.6.2).

Option	Subjects	Comments
A	31414 Information Systems 31424 Systems Modelling 31434 Database Design	Start Autumn or Spring, finish in one year
B	31511 Systems Design 31434 Database Design 31443 Distributed Databases and Client/Server Computing	Start in Spring, finish in 18 months
C	31510 Operating Systems 31512 Networking 1 31513 Networking 2	Start in Autumn, finish in one year
D	31509 Computer Fundamentals 31508 Programming Fundamentals 31414 Information Systems	Start Autumn or Spring, finish in one year
E	31508 Programming Fundamentals 31928 Applications Development with Delphi 31931 Software Quality Assurance	Start in Autumn, finish in one year
F	31424 Systems Modelling 31511 Systems Design 31454 Project Management and the Professional or 31777 Human-Computer Interaction	Start in Autumn, finish in one year

# NUMERICAL LIST OF SUBJECTS

The following tables indicate the number and name of each subject, the semester or semesters in which it is offered, the credit-point value, and the prerequisites and corequisites (indicated by c). The letters A and S refer to the Autumn and Spring semesters respectively, and Y is used to indicate a year-long subject. All prerequisites are in terms of current undergraduate offerings. See the 'Subject descriptions' section for details of other possible prerequisites.

In the case of some elective subjects, no 'Semester offered' is shown. Elective offerings will vary according to demand.

## Bachelor of Science in Computing Science – core subjects

Subject number	Subject name	Semester offered	CP	Prerequisites
22615	Accounting Information Systems	A,S	6	Nil
31414	Information Systems	A,S	6	Nil
31415	Principles of Software Development A	A,S	6	31417 c
31416	Computer Systems Architecture	A,S <sup>1</sup>	6	Nil
31417	Computing Practice	A,S	6	Nil
31424	Systems Modelling	A,S	6	Nil
31425	Principles of Software Development B	A,S	6	31415
31428	Quantitative Modelling	A,S	6	Nil
31429	Procedural Programming	A,S	6	31415, 31425 c
31434	Database Design	A,S	6	31424
31436	Systems Software and Networks	A,S	8	31425, 31429, 31416
31444	Systems Design and Development	A,S	10	31434, 31436 c
31454	Project Management and the Professional	A,S	6	31444, 31697 or 31698
31455	Software Development Case Study	Y	12	31444, 31697 or 31698
31464	Information Technology Planning and Design	A,S	6	31428, 31436, 31444, 31454, 31697
31696	Industrial Training (F/T)	A	0	31414, 31415, 31416, 31417, 31424, 31429, 31434, 31436
31697	Industrial Training (F/T)	S	0	31696
31698	Industrial Training (P/T)	A,S	0	31414, 31415, 31416, 31417, 31424, 31429, 31434, 31436
31699	Industrial Training (P/T)	A,S	0	31698

<sup>1</sup> 31416 Computer Systems Architecture Spring semester is only available for repeat students.

**Note:** The subjects 31698 Industrial Training and 31699 Industrial Training must be taken for two semesters.

## Bachelor of Science in Computing Science (Honours) – core subjects

Subject number	Subject name	Semester offered	CP	Prerequisites
31945	Introduction to Computing Research		6	
31946	The Computing Literature		6	
31947	Honours Research Project		24	31945, 31946
31948	Honours Seminar 1		6	
31949	Honours Seminar 2		6	

**Bachelor of Information Technology – core subjects**

Subject number	Subject name	Semester offered	CP	Prerequisites
22615	Accounting Information Systems	A	6	Nil
24105	Marketing Principles	A	4	Nil
31414	Information Systems	A	6	Nil
31415	Principles of Software Development A	A	6	31718 c
31416	Computer Systems Architecture	A	6	Nil
31424	Systems Modelling	S	6	Nil
31434	Database Design	A	6	31771
31436	Systems Software and Networks	A	8	31416
31443	Distributed Databases and Client/Server Computing	S	6	31434
31444	Systems Design and Development	S	10	31434, 31436 c
31464	Information Technology Planning and Design	S	6	31756
31718	Contemporary Information Technology 1	A	6	Nil
31722	Commercial Programming	S	5	31414, 31415
31735	Information Systems and Organisation Development	A	6	Nil
31736	Business Processes and IT Strategy	S	6	Nil
31756	Project Management	A	5	31444
31769	Contemporary Information Technology 2	S	4	31718
31770	Industry Project 1	S	5	Nil
31771	Business Requirements Analysis	S	5	31414
31779	Applications of Information Technology 1	S	5	31414
31781	Business Systems Design	A	5	31424
31789	Applications of Information Technology 2	A	5	31779
31790	Industry Project 2	A	5	31770

**Bachelor of Computing – core subjects**

Subject number	Subject name	Semester offered	CP	Prerequisites
22615	Accounting Information Systems	A,S	6	Nil
31414	Information Systems	A,S	6	Nil
31417	Computing Practice	A,S	6	Nil
31424	Systems Modelling	A,S	6	Nil
31425	Principles of Software Development B	A,S	6	31508
31428	Quantitative Modelling	A,S	6	31508
31429	Procedural Programming	A,S	6	31508
31434	Database Design	A,S	6	31424
31454	Project Management and the Professional	A,S	6	31511
31464	Information Technology Planning and Design	A,S	6	31454
31507	Australian IT Industry	A,S	6	31515c
31508	Programming Fundamentals	A,S	6	Nil
31509	Computer Fundamentals	A,S	6	Nil
31510	Operating Systems	A,S	6	31509
31511	Systems Design	A,S	6	31424
31512	Networking 1	A,S	6	31429, 31509

## 104 School of Computing Sciences

Subject number	Subject name	Semester offered	CP	Prerequisites
31513	Networking 2	A or S	6	31512
31514	Computing Theory	A or S	6	31425
31515	Introduction to Australian IT Industry	A,S	6	Nil
31931	Software Quality Assurance	A,S	6	31429

### Undergraduate electives

Subject number	Subject name	Semester offered	CP	Prerequisites
31140	Introduction to Computer Graphics	A	6	31425, 31429
31163	Knowledge Technology	A	6	31425 or 31429
31352	Project	A,S	6	31444
31443	Distributed Databases and Client/Server Computing	S	6	31434
31513	Networking 2	A or S	6	31436
31601	Programming for Performance	A	6	31425, 31429
31603	3D Computer Animation	S	6	31140
31605	Computer Graphics Rendering Techniques	S	6	31140
31606	Virtual Communities	A	6	Nil
31735	Information Systems and Organisation Development	S	6	Nil
31736	Business Processes and IT Strategy	S	6	31424
31743	Machine Learning	S	6	31428
31744	Case-based Reasoning	S	6	31163
31745	Knowledge-based Systems	A	6	31743 or 31744
31746	Artificial Intelligence Applications	A	6	31743 or 31744
31748	Programming on the Internet	A,S	6	31436
31749	Internet Commerce	A,S	6	31436
31750	Intelligent Agents in Java	A	6	31748
31777	Human-Computer Interaction	S	6	31444
31778	Resources Management for IT Professionals	S	6	Nil
31860	Object-oriented Programming and C++	S	6	31424, 31429
31876	Operating Systems Facilities	A	6	31429, 31436
31902	Auditing the Computer	S	6	22615
31904	Systems Programming	A	6	31429
31916	Cognitive Modelling	A	6	Nil
31917	Commercial Programming in Cobol	S	6	31429
31919	Distributed Software Programming	S	6	31436, 31904
31921	Objectbases	A	6	31434
31922	Object-oriented Methodologies	A	6	31424
31924	Performance Modelling	A	6	31428, 31432, 31696-7 or 31698-9
31925	Smalltalk	S	6	31415, 31424
31927	Applications Development with Visual Basic	A	6	31414, 31415 or 31429, 31424 c
31928	Applications Development with Delphi	S	6	31414, 31415 or 31429, 31424 c
31931	Software Quality Assurance	S	6	31424
31950	Networked Enterprise Design	S	6	31424

**Aboriginal Studies subjects**

Subject number	Subject name	Semester offered	CP	Prerequisites
015110	Aboriginal Cultures and Philosophies		8	Nil
54230	Aboriginal Social and Political History		8	Nil
54231	Aboriginal People and the Media		8	015110, 54230
54330	The Politics of Aboriginal History		8	See subject description
54331	Aboriginal Forms of Discourse		8	See subject description

**Note:** These subjects comprise the Aboriginal Studies sub-major; they may also be taken as electives.

**International Studies subjects**

Subject number	Subject name	Semester offered	CP	Prerequisites
50140	Comparative Social Change	A, S	8	Nil
97x111	Chinese Language and Culture	A or S	8	See subject descriptions
97x121	Cantonese Language and Culture	A or S	8	See subject descriptions
97x211	Japanese Language and Culture	A or S	8	See subject descriptions
97x311	Indonesian Language and Culture	A or S	8	See subject descriptions
97x320	Thai		8	See subject descriptions
97x331	Malaysian Language and Culture	A or S	8	See subject descriptions
97x414/5	French Language and Culture		8	See subject descriptions
97x424/5	German Language and Culture		8	See subject descriptions
97x434/5	Italian Language and Culture		8	See subject descriptions
97x501	Spanish Language and Culture	A or S	8	See subject descriptions
97x710	Greek		8	See subject descriptions
97x734	Russian		8	See subject descriptions
976101	Chinese East Asia	S	8	Nil
976111	Contemporary China	S	8	Nil
976211	Contemporary Japan	S	8	Nil
976301	Contemporary South-East Asia	S	8	Nil
976401	Contemporary Europe	S	8	Nil
976501	Contemporary Latin America	S	8	Nil
977xxx	In-country Study 1		24	See subject descriptions
978xxx	In-country Study 2		24	See subject descriptions

**Note:** x indicates one of four levels of study. Details of all International Studies subjects can be found in the School of Mathematical Sciences' 'Subject descriptions' section in this handbook.

**Graduate Diploma in Information Technology – core subjects**

Subject number	Subject name	Semester offered	CP	Prerequisites
31414	Information Systems	A,S	6	Nil
31415	Principles of Software Development A	A,S	6	Nil
31424	Systems Modelling	A,S	6	Nil
31429	Procedural Programming	A,S	6	31508
31434	Database Design	A,S	6	31424
31508	Programming Fundamentals	A,S	6	Nil
31509	Computer Fundamentals	A,S	6	Nil
31512	Networking 1	A,S	6	31429, 31509

**Note:** Students may select any elective subjects for which they have the prerequisites, with the exception of Project, from the list of undergraduate electives.

**Master of Science in Computing**

Subject number	Subject name	Semester offered	CP	Prerequisites
31601	Programming for Performance	A	6	31425, 31429
31920	Network Management	S	6	by application
31921	Objectbases	A	6	31434
32108	Applications of Artificial Intelligence	S	6	Nil
32204	Advanced Data Management	A	6	Nil
32208	Information Processing Strategy	S	6	32207
32501	Computer Graphics	A	6	Nil
32509	Human-Computer Interaction in Information Systems	S	6	Nil
32510	Principles of Object-oriented Programming in C++	S	6	32536
32511	Principles of Object-oriented Programming in Smalltalk	S	6	32536
32513	Advanced Machine Learning	S	6	32512
32516	Internet Programming	A&S	6	Nil
32517	Commerce on the Internet	A&S	6	Nil
32520	UNIX Systems Administration	A	6	by application
32521	Internetworking	A	6	by application
32523	Operating Systems for Internetworking	A	6	by application
32524	LANs and Routing	S	6	by application
32525	Distributed Software Programming	S	6	by application
32526	Designing the Networked Enterprise	A	6	Nil
32527	Internetwork Design	S	6	by application
32530	Building Intelligent Agents	A	6	Nil
32531	Global Information Systems	A	6	Nil
32532	Conducting Business Electronically	S	6	Nil
32533	Networking Communities	A	6	Nil
32534	Knowledge Management	S	6	Nil
32535	Databases in Distributed Environments	S	6	Nil
32536	Systems Development (Objects and Processes)	A	6	Nil
32537	Enterprise Wide Software Systems	S	6	Nil
32541	Project Management	A&S	6	Nil
32542	Advanced Cognitive Modelling	A	6	Nil
32543	Advanced 3D Computer Animation	S	6	32501
32544	Advanced Image Synthesis Techniques	S	6	32501
32545	Multi-Agent Systems	S	6	Nil
32546	Business Process Engineering	A	6	Nil
32601	Advanced Project Management	A	6	by application
32604	Systems Integration	S	6	32601
32702	Contemporary Telecommunications	S	6	Nil
32704	Strategic IT Contract Management	S	6	by application
32910	Project 1	all	6	Nil
32911	Project 2	all	6	Nil
95560	Multimedia Industry and Process	A&S	6	by application
95561	Multimedia Products and Technology	A&S	6	by application

**Note:** Subject descriptions should be checked for presumed knowledge. Some subjects run in alternate years. Please check School timetables on the web site for up-to-date information.

**Master of Business in Information Technology Management**

Subject number	Subject name	Semester offered	CP	Prerequisites
21751	Management Research Methods	A	6	GradCertInfTechM
21788	Effective People Management	A	6	Nil
21789	Contemporary Management Practice	S	6	Nil
21806	Managing Organisational Change	A	6	Nil
21807	Total Quality and Productivity Management	A	6	GradCertInfTechM
21808	Strategic Business Management	S	6	GradCertInfTechM, 21806
22746	Managerial Accounting <sup>1</sup>		6	Nil
22747	Accounting for Managerial Decisions <sup>1</sup>		6	Nil
24704	Managing Client Relations	S	6	Nil
25742	Financial Management <sup>1</sup>		6	Nil
32601	Advanced Project Management	A	6	Nil
32602	Impact of Information Technology	Summer	6	Nil
32604	Systems Integration	S	6	32601
32605	Managerial Analysis and Evaluation of Information Systems	S	6	Nil
32701	Advances in Information Technology	S	6	Nil
32702	Contemporary Telecommunications	S	6	Nil
32703	Information Technology Strategy	S	6	Nil
32704	Strategic IT Contract Management	S	6	GradCertInfTechM
32806	Project A	A,S	6	GradDipInfTechM, 21751c
32812	Project B	A,S	6	32806

<sup>1</sup> There is no semester information available for these subjects.

**Master of Interactive Multimedia**

Subject number	Subject name	Semester offered	CP	Prerequisites
31429	Procedural Programming	A,S	6	31415
31436	Systems Software and Networks	A,S	8	31429, 31425, 31416
31512	Networking 1	A,S	6	Nil
31513	Networking 2		6	31512
31876	Operating Systems Facilities	A	6	31436
31904	Systems Programming	A	6	31429
31927	Applications Development with Visual Basic	A,S	6	31414 and/or 31415 or 31429
32106	Object-oriented Software Development	A	6	Nil
32307	Operating Systems	S	6	Nil
32501	Computer Graphics	A	6	Nil
32516	Internet Programming	A,S	6	Nil
32522	C for Systems Programmers	A	6	Nil
49031	Information Structures, Perception and User Interface Design		6	
49241	Hypermedia Technologies		6	
49242	Mono Media Technologies		6	
49243	Design of Hypermedia Information Systems		6	
50457	Theories of the Visual		8	
51007	Media Studies		4	
52272	Sound, Music, Noise		8	

**108 School of Computing Sciences**

Subject number	Subject name	Semester offered	CP	Prerequisites
52274	Sound Studies		8	
54101	Sound and Image		6	
54110	Media, Culture and Society		6	
54116	Audiovisual Media Production		6	
54150	Computers and Print Production		4	
54151	Computers and Audiovisual Production		4	
54153	Video Basic		4	
54294	Sound Design		8	
54299	NetDesign		8	
55902	Information Behaviour		6	
55903	Information Production and Presentation		6	
55906	Organisation of Information		6	
55907	Information Retrieval		6	
55910	User Documentation 1		6	
55911	User Documentation 2		6	
81021	Communication Technology		4	
81024	Computer Graphics 1		4	
81030	3D Computer Animation 2		4	
81923	Introduction to Design Computing		4	
81925	3D Computer Animation 1		4	
82009	Human Factors and Design		4	
82016	Graphic Visualisation		4	
82017	2D and 3D Communication		4	
82915	Photography for Designers		4	
95560	Multimedia Industry and Process		8	
95561	Multimedia Products and Technology		8	
95562	Multimedia Project		24	Grad Dip in Multimedia

**Master of Science in Internetworking**

Subject number	Subject name	Semester offered	CP	Prerequisites
31904	Systems Programming	A	6	31429
32516	Internet Programming	A,S	6	
32518	Internetworking Research	A	6	GradDip in Internetworking
32519	Internetworking Project (18)	A&S	18	32518 (corequisite)
32520	UNIX Systems Administration	A	6	32522 or 31904
32521	Internetworking	A	6	32524
32522	C for Systems Programmers	A	6	Nil
32523	Operating Systems for Internetworking	A	6	
32524	LANs and Routing	S	6	32523
32525	Distributed Software Programming	S	6	31904 or 32522
32527	Internetwork Design	S	6	32521
32528	Network Management	S	6	32521
32529	Internetworking Project (12)	A&S	12	32518 (corequisite)
49201	Integrated Services Network	A	6	Nil

# ALPHABETICAL LIST OF SUBJECTS

## Undergraduate subjects

### Explanatory notes

- 1 Subjects taught by other faculties
- 2 BInfTech only
- 3 GradDipInfTech and Graduate Certificates only
- 4 Elective subject
- 5 Not offered in 2000
- 6 Honours only
- 7 BSc only
- 8 BComp only
- 9 BSc BA subject
- 10 Not for BSc or BInfTech

Aboriginal Cultures and Philosophies <sup>1,4</sup>	015110
Aboriginal Forms of Discourse <sup>1,4</sup>	54331
Aboriginal People and the Media <sup>1,4</sup>	54231
Aboriginal Social and Political History <sup>1,4</sup>	54230
Accounting Information Systems <sup>1</sup>	22615
Applications Development with Delphi <sup>4</sup>	31928
Applications Development with Visual Basic <sup>4</sup>	31927
Applications of Information Technology <sup>1,2</sup>	31779
Applications of Information Technology <sup>2,2</sup>	31789
Artificial Intelligence Applications <sup>4</sup>	31746
Auditing the Computer <sup>4</sup>	31902
Australian IT Industry <sup>8</sup>	31507
Business Processes and IT Strategy <sup>2,4</sup>	31736
Business Requirements Analysis <sup>2</sup>	31771
Business Systems Design <sup>2</sup>	31781
Cantonese Language and Culture <sup>1,9</sup>	97x121
Case-based Reasoning <sup>4</sup>	31744
Chinese East Asia <sup>1,9</sup>	976101
Chinese Language and Culture <sup>1,9</sup>	97x111
Cognitive Modelling <sup>4</sup>	31916
Commercial Programming <sup>2</sup>	31722
Commercial Programming in Cobol <sup>4</sup>	31917
Comparative Social Change <sup>9</sup>	50140
Computer Graphics Rendering Techniques <sup>4</sup>	31605
Computer Fundamentals <sup>10</sup>	31509
Computer Systems Architecture <sup>2,7</sup>	31416
Computing Literature, The <sup>6</sup>	31946
Computing Practice	31417
Computing Theory <sup>8</sup>	31514
Contemporary China <sup>1,9</sup>	976111
Contemporary Europe <sup>1,9</sup>	976401
Contemporary Information Technology <sup>1,2</sup>	31718
Contemporary Information Technology <sup>2,2</sup>	31769
Contemporary Japan <sup>1,9</sup>	976211
Contemporary Latin America <sup>1,9</sup>	976501
Contemporary South-East Asia <sup>1,9</sup>	976301

Database Design	31434
Distributed Databases and Client/Server Computing <sup>2,4</sup>	31443
Distributed Software Programming <sup>4</sup>	31919
French Language and Culture <sup>1,9</sup>	97x414/5
German Language and Culture <sup>1,9</sup>	97x424/5
Greek <sup>1,9</sup>	97x710
Honours Research Project <sup>6</sup>	31947
Honours Seminar 1 <sup>6</sup>	31948
Honours Seminar 2 <sup>6</sup>	31949
Human-Computer Interaction <sup>4</sup>	31777
In-country Study 1 <sup>9</sup>	977xxx
In-country Study 2 <sup>9</sup>	978xxx
Indonesian Language and Culture <sup>1,9</sup>	97x311
Industrial Training (F/T) <sup>7</sup>	31696
Industrial Training (F/T) <sup>7</sup>	31697
Industrial Training (P/T) <sup>7</sup>	31698
Industrial Training (P/T) <sup>7</sup>	31699
Industry Project 1 <sup>2</sup>	31770
Industry Project 2 <sup>2</sup>	31790
Information Systems	31414
Information Systems and Organisation Development	31735
Information Technology Planning and Design <sup>2,7,8</sup>	31464
Intelligent Agents in Java <sup>4</sup>	31750
Internet Commerce <sup>4</sup>	31749
Introduction to Australian IT Industry <sup>8</sup>	31515
Introduction to Computer Graphics <sup>4</sup>	31140
Introduction to Computing Research <sup>6</sup>	31945
Italian Language and Culture <sup>1,9</sup>	97x434/5
Japanese Language and Culture <sup>1,9</sup>	97x211
Knowledge Technology <sup>4</sup>	31163
Knowledge-based Systems <sup>4</sup>	31745
Machine Learning <sup>4</sup>	31743
Malaysian Language and Culture <sup>1,9</sup>	97x331
Marketing Principles <sup>1,2</sup>	24105
Networked Enterprise Design <sup>4</sup>	31950
Networking 1 <sup>10</sup>	31512
Networking 2 <sup>4</sup>	31513
Objectbases <sup>4</sup>	31921
Object-oriented Methodologies <sup>4</sup>	31922
Object-oriented Programming and C++ <sup>4</sup>	31860
Operating Systems <sup>10</sup>	31510
Operating Systems Facilities <sup>4</sup>	31876
Performance Modelling <sup>4</sup>	31924
Politics of Aboriginal History, The <sup>1,4</sup>	54330
Principles of Software Development A <sup>2,7</sup>	31415
Principles of Software Development B	31425
Procedural Programming	31429
Programming for Performance <sup>4</sup>	31601
Programming Fundamentals <sup>10</sup>	31508

Programming on the Internet <sup>4</sup>	31748
Project <sup>4</sup>	31352
Project Management <sup>2</sup>	31756
Project Management and the Professional	31454
Quantitative Modelling	31428
Resources Management for IT Professionals <sup>4</sup>	31778
Russian <sup>1,9</sup>	97x734
Smalltalk <sup>4</sup>	31925
Software Development Case Study <sup>7</sup>	31455
Software Quality Assurance <sup>4</sup>	31931
Spanish Language and Culture <sup>1,9</sup>	97x501
Systems Design <sup>10</sup>	31511
Systems Design and Development <sup>2,7</sup>	31444
Systems Modelling	31424
Systems Programming <sup>4</sup>	31904
Systems Software and Networks <sup>2,7</sup>	31436
Thai <sup>1,9</sup>	97x320
3D Computer Animation <sup>4</sup>	31603
Virtual Communities <sup>4</sup>	31606

## Postgraduate subjects

Accounting for Managerial Decisions	22747
Advanced Cognitive Modelling	32542
Advanced Data Management	32204
Advanced Image Synthesis Techniques	32544
Advanced Machine Learning	32513
Advanced Project Management	32601
Advanced 3D Computer Animation	32543
Advances in Information Technology	32701
Applications of Artificial Intelligence	32108
Audiovisual Media Production	54116
Building Intelligent Agents	32530
Business Process Engineering	32546
C for Systems Programmers	32522
Commerce on the Internet	32517
Communication Technology	81021
Computer Graphics	32501
Computer Graphics 1	81024
Computers and Audiovisual Production	54151
Computers and Print Production	54150
Conducting Business Electronically	32532
Contemporary Management Practices	21789
Contemporary Telecommunications	32702
Databases in Distributed Environments	32535
Design of Hypermedia Information Systems	49243
Designing the Networked Enterprise	32526
Distributed Software Programming	32525
Effective People Management	21788
Enterprise Wide Software Systems	32537
Financial Management	25742
Global Information Systems	32531
Graphic Visualisation	82016
Human-Computer Interaction in Information Systems	32509
Human Factors and Design	82009
Hypermedia Technologies	49241
Impact of Information Technology	32602
Information Behaviour	55902
Information Processing Strategy	32208
Information Production and Presentation	55903
Information Retrieval	55907
Information Structures, Perception and User Interface Design	49031
Information Technology Strategy	32703
Integrated Services Network	49201
Internet Programming	32516
Internetwork Design	32527
Internetworking	32521
Internetworking Project (12cp)	32529
Internetworking Project (18cp)	32519
Internetworking Research	32518
Introduction to Design Computing	81923
Knowledge Management	32534
LANs and Routing	32524
Management Research Methods	21751
Managerial Accounting	22746

Managerial Analysis and Evaluation of Information Systems	32605	Sound and Image	54101
Managing Client Relations	24704	Sound Design	54294
Managing Organisational Change	21806	Sound, Music, Noise	52272
Media, Culture and Society	54110	Sound Studies	52274
Media Studies	51007	Strategic Business Management	21808
Mono Media Technologies	49242	Strategic IT Contract Management	32704
Multi-Agent Systems	32545	Systems Development (Objects and Processes)	32536
Multimedia Industry and Process	95560	Systems Integration	32604
Multimedia Products and Technology	95561	Theories of the Visual	50457
Multimedia Project <sup>5</sup>	95562	3D Computer Animation 1	81925
NetDesign	54299	3D Computer Animation 2	81030
Network Management	32528	Total Quality and Productivity Management	21807
Networking Communities	32533	2D and 3D Communication	82017
Objectbases	31921	UNIX Systems Administration	32520
Object-oriented Software Development	32106	User Documentation 1	55910
Operating Systems	32307	User Documentation 2	55911
Operating Systems for Internetworking	32523	Video Basic	54153
Organisation of Information	55906		
Photography for Designers	82915		
Principles of Object-oriented Programming in Smalltalk	32511		
Programming for Performance	31601		
Project 1	32910		
Project 2	32911		
Project A	32806		
Project B	32812		
Project Management	32541		

# SUBJECT DESCRIPTIONS

## Guide to subject descriptions

The subject descriptions shown below indicate the subject number and name, the number of credit points for the subject (e.g. 4cp), and the number of formal contact hours per week (e.g. 3hpw). Also shown are the prerequisites or corequisites, if any, and a brief outline of the content.

Prerequisites are subjects that must be completed before taking the subject to which they refer. Corequisites may be completed before or be taken concurrently with the subject to which they refer.

Subjects offered by the School of Mathematical Sciences are listed first, followed by those offered by the School of Computing Sciences and other faculties.

## SCHOOL OF MATHEMATICAL SCIENCES

### 33401

#### Introductory Mathematical Methods

*6cp; 3hpw*

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. Classification of critical points.

### 35100

#### Mathematical Practice

*6cp; 4hpw*

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. Mathematical practice case studies.

### 35101

#### Mathematics 1

*6cp; 6hpw*

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. Improper integrals.

### 35102

#### Mathematics 2

*6cp; 6hpw; prerequisite: 35101 Mathematics 1; corequisite: 35140 Operations Research Modelling*

Complex numbers and the solution of polynomial equations. 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. Double integrals.

### 35106

#### Mathematics in Sport

*6cp; 3hpw*

Selection of major topics from: 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. Instances of the use of mathematics in (alphabetically) athletics, basketball, blackjack, cricket, darts, football, snooker, tennis, among others.

**35110****Discrete Mathematics (S)***6cp; 3hpw*

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, Turing machines.

**35111****Discrete Mathematics***6cp; 4hpw*

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, Turing machines.

**35140****Operations Research Modelling***6cp; 4hpw*

An introduction to operations research methodology. A variety of problems from manufacturing, construction, transportation and finance will be considered, together with approaches to the formulation of the corresponding mathematical models. Solutions for the models will be obtained using decision support software with particular emphasis on spreadsheets and their uses in business applications. The art of model building will be discussed in conjunction with an introductory description of several important solution methods. This description will include the introduction of matrices, determinants and vectors.

**35151****Statistics 1***6cp; 6hpw*

Describing and exploring data. Producing data. Probability. Random variables. Introduction to inference. Inference for distributions. Inference for categorical data. Regression. Analysis of variance. Distribution-free inference.

**35170****Introduction to Computing***6cp; 7hpw*

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*

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. The resurgence of geometry and algebra in the 19th century.

**35212****Linear Algebra***6cp; 4hpw; prerequisite: 35140 Operations Research Modelling*

Systems of linear equations, decompositions. Vector spaces. Inner product spaces, Gram-Schmidt orthogonalisation. The eigenvalue problem. Symmetric matrices, diagonalisation, quadratic forms. Jordan form. Matrix exponentials.

### 35231

#### Differential Equations

6cp; 4hpw; prerequisite: 35102 Mathematics 2

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. Transform methods.

### 35232

#### Advanced Calculus

6cp; 4hpw; prerequisite: 35102 Mathematics 2

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. Contour integration.

### 35241

#### Optimisation 1

6cp; 4hpw; prerequisites: 35102 Mathematics 2; 35140 Operations Research Modelling

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. First- and second-order optimality conditions for nonlinear programming.

### 35252

#### Statistics 2

6cp; 4hpw; prerequisites: 35102 Mathematics 2; 35151 Statistics 1

Probability. Random variables and their probability distributions. Multivariable probability distributions. Functions of random variables. Sampling distributions and the Central Limit Theorem. Applications to estimation. Multivariate normal distribution.

### 35254

#### Health Statistics

6cp; 4hpw; prerequisite: 35151 Statistics 1

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. Ethical issues in health statistics.

### 35281

#### Numerical Analysis 1

6cp; 4hpw; prerequisite: 35170 Introduction to Computing; corequisite: 35231 Differential Equations

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.

### 35290

#### Group Project

6cp; 4hpw; corequisites: 35241 Optimisation 1; 35252 Statistics 2

A project-based subject in which students work in groups to produce a design and a working implementation of a specified problem. The groups will be expected to acquire and implement project management techniques, including regular meetings, production of action minutes and the joint development of a solution.

### 35292-6

#### Project

2-6cp; 1-4hpw; prerequisite: by consent; corequisite: by arrangement

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; prerequisites: 35231 Differential Equations; 35232 Advanced Calculus

Projective geometry: Euclidean and non-Euclidean geometry, Pappus' and Desargues' theorems, transformations in the plane, collineations, projectivities, incidence matrices, Latin squares. Differential geometry: vector

fields, vector fields on surfaces, Gauss map, Weingarten map, curvature of curves and surfaces.

### 35314

#### Pure Mathematics 3B

6cp; 4hpw; prerequisite: 35111 Discrete Mathematics

Number theory: the division algorithm and unique factorisation in  $\mathbb{Z}$ , 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. Introduction to rings: homomorphisms, subrings, ideals, quotient rings.

### 35321

#### Analysis 1

6cp; 4hpw; prerequisite: 35102 Mathematics 2

Algebraic and order properties of  $\mathbb{R}$ . 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. Weierstrass M-test.

### 35322

#### Analysis 2

6cp; 4hpw; prerequisites: 35321 Analysis 1; 35212 Linear Algebra

Metric and normed spaces, Banach spaces. Compact subsets of  $\mathbb{R}$ , 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.  $L^p$  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. Conditional expectation and conditional probability.

### 35333

#### Applied Mathematics 3A

6cp; 4hpw; prerequisite: 35232 Advanced Calculus; corequisite: 35335 Mathematical Methods

Modelling mechanical properties: force, work, energy, power, projectiles, oscillation, orbits. 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; prerequisites: 35333 Applied Mathematics 3A; 35335 Mathematical Methods

Acoustic waves in fluids. Waves on a liquid surface. Elastic waves in solids. Electromagnetic waves.

### 35335

#### Mathematical Methods

6cp; 4hpw; prerequisite: 35231 Differential Equations

Vector integral theorems. Bessel and Legendre equations. Applications to boundary value problems. Integral transform methods for solving boundary value problems.

### 35340

#### Operations Research Practice

6cp; 4hpw; prerequisites: 35241 Optimisation 1; 35252 Statistics 2

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. 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: 35241 Optimisation 1

Dual simplex method. Basic ideas of cutting plane and branch-and-bound methods for integer programming. Primal-dual algorithm. Parametric linear programming. Goal programming. Numerical methods for unconstrained nonlinear optimisation; Newton's method, conjugate direction methods. Numerical methods for constrained nonlinear optimisation; feasible direction methods, penalty and barrier methods. Introduction to stochastic programming.

### 35344

#### Network Optimisation

6cp; 4hpw; prerequisite: 35241 Optimisation 1

Transportation problems. The transportation simplex method. Assignment problems. Transshipment 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. Solution of problems using commercially-available software.

### 35353

#### Regression Analysis

6cp; 4hpw; prerequisite: 35252 Statistics 2

Simple and multiple linear regression. General linear models. Weighted regression. Diagnostics and model building. Analysis of covariance. Regression graphics. Introduction to nonlinear regression.

### 35355

#### Quality Control

6cp; 4hpw; prerequisite: 35252 Statistics 2

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. 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; prerequisites: 35212 Linear Algebra; 35252 Statistics 2

Introduction to general concepts of the design of experiments. Completely randomised, randomised complete block and Latin square designs. Multiple comparisons. Factorial designs. Introduction to Taguchi designs and response surface designs.

### 35361

#### Probability and Stochastic Processes

6cp; 4hpw; prerequisite: 35252 Statistics 2

Probability. Random variables and expectations. Limit theorems. Markov chains. The Poisson process. Birth and death processes.

### 35363

#### Simulation Modelling

6cp; 4hpw; prerequisite: 35170 Introduction to Computing; corequisite: 35361 Probability and Stochastic Processes

Bayesian statistics and Bayesian decision making, Monte Carlo simulation, prior distributions, decision trees and influence diagrams, conjugate distributions. Various queuing models and applications. Simulation studies, modelling systems and various representations, statistical modelling, input data analysis, verification and validation, output analysis, comparison of systems designs, random number generation and tests, random variate generation, variance reduction techniques.

### 35382

#### Numerical Analysis 2

6cp; 4hpw; prerequisite: 35281 Numerical Analysis 1

Numerical linear algebra: the algebraic eigenvalue 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. 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.

**35384****Financial Modelling**

6cp; 3hpw; prerequisites: 35102 Mathematics 2; 35151 Statistics 1

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; internal financing and growth.

**35391****Seminar (Mathematics)**

6cp; 4hpw; prerequisite: by arrangement

Group studies in mathematics. The topics will vary from year to year and will be chosen in accordance with the interests of students and staff, and the availability of staff.

**35392****Seminar (Operations Research)**

6cp; 4hpw; prerequisite: by arrangement

Group studies in operations research. The topics will vary from year to year and will be chosen in accordance with the interests of students and staff, and the availability of staff.

**35393****Seminar (Statistics)**

6cp; 4hpw; prerequisite: by arrangement

Group studies in statistics. The topics will vary from year to year and will be chosen in accordance with the interests of students and staff, and the availability of staff.

**35394****Seminar (Computing)**

6cp; 4hpw; prerequisite: by arrangement

Group studies in computing. The topics will vary from year to year and will be chosen in accordance with the interests of students and staff, and the availability of staff.

**35418****Analytic Number Theory**

4cp; 3hpw; prerequisites: 35314 Pure Mathematics 3B; 35232 Advanced Calculus

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; analytic proof of the prime number theorem.

**35419****Advanced Algebra**

4cp; 3hpw; prerequisite: 35314 Pure Mathematics 3B

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, submodules, 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 constructibility 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: 35322 Analysis 2

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. Fourier series.

**35428****Convexity and Optimisation***4cp; 3hpw; prerequisite: 35322 Analysis 2*

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; introduction to applications in optimal control theory.

**35436****Advanced Mathematical Methods***4cp; 3hpw; prerequisite: 35334 Applied Mathematics 3B*

Generalised functions, Green's functions, applications in electrostatics and electromagnetism. Tensor analysis: tensors from a geometrical viewpoint, metric and curvature tensors, differential forms, Stokes' theorem, applications in special relativity and Maxwell's equations. Use of the symbolic package MathTensor.

**35437****Partial Differential Equations***4cp; 3hpw; prerequisite: 35335 Mathematical Methods*

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. Scattering of plane waves by cylinders.

**35438****Nonlinear Dynamical Systems***4cp; 3hpw; prerequisites: 35231 Differential Equations; 35321 Analysis 1*

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. Applications to the theory of finance.

**35443****Advanced Mathematical Programming***4cp; 3hpw; prerequisite: 35342 Optimisation 2*

Decomposition methods for large-scale mathematical programming problems. Ellipsoid methods. Karmarkar's projective algorithm. Stochastic programming, two-stage stochastic programming problems.

**35446****Scheduling Theory***4cp; 3hpw; prerequisites: 35342 Optimisation 2; 35447 Discrete Optimisation*

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. Scheduling and controlling manufacturing.

**35447****Discrete Optimisation***4cp; 3hpw; prerequisites: 35111 Discrete Mathematics; 35342 Optimisation 2*

Example 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. Performance guarantees for approximation algorithms.

**35448****Dynamic Optimisation***4cp; 3hpw; prerequisites: 35241 Optimisation 1; 35361 Probability and Stochastic Processes; corequisite: 35447 Discrete Optimisation*

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. Applications of the Markov decision model.

### 35456

#### Nonlinear Statistical Models

*4cp; 3hpw; prerequisite: 35353 Regression Analysis*

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. Nonlinear mixture models and segmented models.

### 35457

#### Multivariate Statistics

*4cp; 3hpw; prerequisite: 35353 Regression Analysis*

Multivariate normal distribution: definition, moments, characteristic function, estimation of mean and covariance matrices, Wishart distribution, Hotelling's T<sup>2</sup>. Multivariate linear regression. Principal components. Factor analysis. Cluster analysis.

### 35458

#### Loglinear Modelling

*4cp; 3hpw; prerequisite: 35353 Regression Analysis*

Revision of linear models and exponential families. Generalised linear models. Applications including logistic regression and contingency tables. Modelling using statistical distributions; continuous distribution models; discrete distribution models.

### 35459

#### Linear Models and Experimental Design

*4cp; 3hpw; prerequisites: 35353 Regression Analysis; 35356 Design and Analysis of Experiments; 35457 Multivariate Statistics*

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. Repeated measures designs.

### 35466

#### Advanced Stochastic Processes

*4cp; 3hpw; prerequisites: 35322 Analysis 2; 35361 Probability and Stochastic Processes*

Formal definitions of probability space and stochastic processes. Martingales. Riemann-Stieltjes integration. Brownian motion and related processes. Stochastic calculus and stochastic differential equations. Financial applications.

### 35467

#### Time Series Analysis

*4cp; 3hpw; prerequisite: 35361 Probability and Stochastic Processes*

Nonseasonal 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

*4cp; 3hpw; prerequisites: 35353 Regression Analysis; 35355 Quality Control; 35361 Probability and Stochastic Processes; corequisite: enrolment in any 12cp of core statistics subjects in the Honours program*

Introduction to the general framework of statistical consulting, including a large practical component. 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. Ethical issues.

### 35485

#### Advanced Financial Modelling

*4cp; 3hpw; prerequisite: 35340 Operations Research Practice*

Options and futures: concepts and valuation models, current issues and developments. Capital structure and the theory of the firm: the effects of corporate and personal taxation on the capital structure of a firm, dividend policy, current issues.

### 35486

#### Optimal Control 1

4cp; 3hpw; prerequisites: 35231 *Differential Equations*; 35232 *Advanced Calculus*

Problems of the calculus of variations and optimal control. 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; prerequisites: 35466 *Advanced Stochastic Processes*; 35486 *Optimal Control 1*

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. Discussion of solutions in particular cases.

### 35491

#### Honours Seminar A

4cp; 3hpw; prerequisite: by consent

This subject will provide an opportunity for students to benefit from the specialist knowledge of a visitor to the School or to undertake a course in an area of specific staff research or knowledge.

### 35492

#### Honours Seminar B

4cp; 3hpw; prerequisite: by consent

As for 35491.

### 35496

#### Thesis Seminar A

4cp; 3hpw; prerequisite: by consent

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: by consent

As for 35496.

### 35498

#### Thesis (Honours)

16cp; prerequisite: by consent

Students will perform an independent investigation of an area of the mathematical sciences chosen in consultation with a supervisor who will be appointed by the Head of School. This is a year-long subject. Students are expected to spend three hours per week on their project in Autumn semester and six hours per week in Spring semester.

### 35542

#### Applied Mathematical Programming

6cp; 4hpw; prerequisite: admission to the course

Duality theory for linear programming. The dual simplex method. The primal-dual algorithm. Parametric linear programming. Goal programming. Unconstrained non-linear optimisation, optimality conditions. Feasible-point methods. Penalty and barrier methods. Introduction to integer programming. Introduction to stochastic programming.

### 35544

#### Network Modelling

6cp; 4hpw; prerequisite: admission to the course

Network notation. Minimal spanning trees. Minimal cost network flow problems. Transportation problems. The transportation simplex method. Assignment and transshipment problems. The out-of-kilter algorithm. Maximal flow problems. Shortest path problems. Project planning and scheduling. CPM cost models.

### 35545

#### Further Methods in Operations Research

6cp; 4hpw; prerequisites: 35151 *Statistics 1*; 35342 *Optimisation 2*

Financial, manufacturing, service and transportation applications of discrete optimisation and deterministic and stochastic dynamic programming. Approximation algorithms and modern heuristic techniques for discrete optimisation.

**35549****Case Studies in Management Science**

*6cp; 4hpw; prerequisites: 35340 Operations Research Practice; 35342 Optimisation 2; 35363 Simulation Modelling*

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; sensitivity and error analysis.

**35563****Applied Simulation Modelling**

*6cp; 4hpw; prerequisite: admission to the course*

Queuing models. Activity-cycle diagrams. Simulation languages. Input data analysis. Output data analysis. Comparison of alternative designs. Variance reduction. Decision theory.

**35592-6****Project (Postgraduate)**

*4,6,8,10,12cp; prerequisite: by arrangement*

A supervised investigation of a topic in an area of interest providing the student with additional skills of direct use in employment.

**35599****Report**

*24cp; prerequisite: by consent*

An applied or theoretical study in an area chosen in consultation with the project supervisor who will be appointed by the Head of School. This is a year-long subject. Students are expected to spend three hours per week on their project in Autumn semester and six hours per week in Spring semester.

**SCHOOL OF COMPUTING SCIENCES****31140****Introduction to Computer Graphics**

*6cp; prerequisites: 31425 Principles of Software Development B; 31429 Procedural Programming or equivalent*  
*subject coordinator: Dr K Suffern*

Provides a thorough introduction to the computer representation, manipulation and display of pictorial information. Topics covered include: passive and interactive graphics; hardware devices and programming; mathematical tools for two- and three-dimensional graphics; two- and three-dimensional graphics and algorithms; graphics standards; human-computer interaction and graphical design; application areas of computer graphics.

**31163****Knowledge Technology**

*6cp; prerequisites: 31425 Principles of Software Development B; 31429 Procedural Programming or equivalent*  
*subject coordinator: Professor J Debenham*

Knowledge representation: state space graphs, And/Or graphs, productions, semantics nets, frames, logic. Inference. Search: various strategies. Uncertainty: probability, hypothetical reasoning, temporal logic, evidence, inference nets. Inexact reasoning: inference nets, certainty factors, Dempster-Shafer theory. Fuzzy logic, fuzzy sets.

**31352****Project**

*6cp; prerequisite: 31444 Systems Design and Development or equivalent*  
*subject coordinator: Mr J Tu*

This project is intended to give a student experience in working independently, and responsibility for scientific research or the development of a small system from initial analysis to user documentation. Projects may be drawn from any area of information technology. Each project is supervised by a member of academic staff.

## 122 Subject descriptions

### 31414

#### Information Systems

6cp

*subject coordinator: Mr C S Johnson*

This subject deals with information systems in their organisational context.

The effects of information systems on society, organisations and individuals are discussed. Examples from typical organisations are used to illustrate information systems concepts. Techniques for analysing and describing user requirements are introduced.

Throughout the subject there is an emphasis on human activities, the importance of the user in the analysis phase and the usability of systems. Another theme is communication skills i.e. the ability of the analyst and designer of an information system to interview, write reports and manuals, design efficient and effective interfaces, and give presentations on the system.

### 31415

#### Principles of Software Development A

6cp; *corequisite: 31417 Computing Practice*

*subject coordinator: Dr R Rist*

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.

### 31416

#### Computer Systems Architecture

6cp

*subject coordinator: Mr C W Johnson*

This subject provides a sound basis for understanding how computer hardware and data communications support higher-level software constructions. All software undergoes a process of translation or interpretation which reduces it to primitive operations capable of being performed by the 'hardware'. In this subject, these primitive operations, and the organisation and design of computer systems that execute these operations, are examined. The SPARC architecture, together with its assembly language, is studied as an example of a contemporary (and real) computer architecture. This subject also presents some fundamental concepts in data communications, as a basis for later subjects which treat the topic in greater depth.

### 31417

#### Computing Practice

6cp

*subject coordinator: Mr J Colville*

Principles of responsible computer use. Computer skills: Touch typing. DOS commands. Microsoft Windows. The Macintosh environment. Introductory word processing, spreadsheets and graphics. The UNIX environment, ftp, telnet, electronic mail. File conversions. Backups. Introductory library research skills. Introduction to report writing.

### 31424

#### Systems Modelling

6cp

*subject coordinator: Mr J El-Den*

This subject introduces information system concepts, including their static and dynamic components. It describes how these concepts can be used to model information systems to correctly capture their structure and needs. It outlines how the ability to capture information about the system in ways understood by its eventual users will improve the final quality of the system.

The subject introduces analysis using various approaches found in contemporary system development, including object-oriented methods, data flow diagrams and Entity-Relationship modelling, and describes the relationships between these techniques and their application.

### 31425

#### Principles of Software Development B

6cp; *prerequisite: 31415 Principles of Software Development A*

*subject coordinator: Dr T Osborn*

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**subject coordinator: Dr T Osborn*

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: 31415 Principles of Software Development A**subject coordinator: Dr B Howarth*

Top-down structured program design techniques and their application to the development of commercial programming applications. Emphasis will be on the quality and usability of the resultant systems. Debugging and testing skills are developed. The language used is C.

**31434****Database Design***6cp; prerequisite: 31424 Systems Modelling**subject coordinator: Dr C Liu*

This subject introduces the students to basic database design and implementation concepts. Database design techniques, including relational design and E-R analysis, are presented. Database programming using SQL is covered in lectures and supported by practical exercises. Object database and distributed database concepts are introduced.

**31436****Systems Software and Networks***8cp; prerequisites: 31425 Principles of Software Development B; 31429 Procedural Programming; 31416 Computer Systems Architecture**subject coordinator: Mr J Vochtelo*

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.

**31443****Distributed Databases and Client/Server Computing***6cp; prerequisite: 31434 Database Design**subject coordinator: Dr G Feuerlicht*

This subject introduces the students to basic distributed databases and client/server concepts. The classical approach to distributed databases is described in detail, and supported with both theoretical and practical exercises. Modern client/server and database server techniques are introduced.

**31444****Systems Design and Development***10cp; prerequisite: 31434 Database Design;**corequisite: 31436 Systems Software and Networks**subject coordinator: Mr R Raban*

This is a project-based subject which guides students through an information systems development process. The requirements for the information system are specified in a series of Use Cases. The development involves designing the user interface and data system and then designing and implementing the system. The emphasis throughout the development is on meeting the user's requirements, implementing a distributed solution and integrating the new systems with the existing information systems infrastructure. Attention to the quality of the system outcomes is maintained throughout the development process. Students will work in managed teams of 10. There are no formal lectures and no exams in this subject; staff/student contact takes place at regular structured project meetings and discussion meetings. Students are expected to have at least four hours of contact with their team each week and, given that this is a 10-credit-point subject, to do significant work outside of this contact time.

**31454****Project Management and the Professional***6cp; prerequisite: 31444 Systems Design and Development**subject coordinator:**Associate Professor D Wilson*

This subject covers the management of the development and implementation of information technology solutions, with particular emphasis on information systems project

## 124 Subject descriptions

management, managing software quality assurance and the professional ethics of software developers.

### 31455

#### Software Development Case Study

*12cp; prerequisite: 31444 Systems Design and Development*

*subject coordinator: Dr B Lederer*

In the first semester, lectures will run in two strands: one devoted to projects, and the other to automata theory and new theory and skills. Laboratories will work on the projects.

The major project will incorporate the following stages: modular decomposition of the system; development of interfaces to the user (GUIs), between modules, to class libraries and to other applications (code-wrapping); coping with change of specifications; detailed coding; and verification, documentation and testing. This is a full-year subject.

### 31464

#### Information Technology Planning and Design

*6cp; prerequisites: 31428 Quantitative Modelling; 31436 Systems Software and Networks; 31444 Systems Design and Development; 31454 Project Management and the Professional*

*subject coordinator: Mr C S Johnson*

This subject is a capstone subject for the course and incorporates knowledge gained in previous subjects, including industrial experience. Students are required to work in groups to produce a large report based on case study material. The objective is to produce a strategic solution to the problem presented in the case study involving both planning and design. The subject emulates the commercial environment in that students work in project groups and hold weekly project review meetings. A presentation to management occurs at the end of the subject.

### 31507

#### Australian IT Industry

*6cp*

*subject coordinator: tba*

An overview of information technology in Australia. Key market areas and current trends will be studied, as well as the global nature of information technology.

### 31508

#### Programming Fundamentals

*6cp*

*subject coordinator: Mr J Underwood*

Students learn programming concepts, and learn to write medium-size programs in an object-oriented language.

### 31509

#### Computer Fundamentals

*6cp*

*subject coordinator: Mr C W Johnson*

This subject introduces students to the internal organisation of the computer.

### 31510

#### Operating Systems

*6cp; prerequisite: 31429 Procedural Programming*

*subject coordinator: Mr J Colville*

This subject introduces students to modern operating systems, and shows how the systems support applications programs.

### 31511

#### Systems Design

*6cp; prerequisite: 31424 Systems Modelling*

*subject coordinator: Mr R Raban*

This subject gives students practical skills in designing medium-scale computer applications.

### 31512

#### Networking 1

*6cp*

*subject coordinator: Mrs E Lawrence*

This subject introduces students to data communications concepts and provides detailed information about the physical and data link layers for several network types.

### 31513

#### Networking 2

*6cp; prerequisite: 31512 Networking or equivalent*

*subject coordinator: tba*

This subject builds on the content of 31512 Networking 1 to introduce students to the operation of local area networks, network applications and control.

**31514****Computing Theory***6cp**subject coordinator: Professor J Debenham*

This subject introduces students to some of the theory underlying computing science. It includes such topics as formal methods and computational complexity.

**31515****Introduction to Australian IT Industry***6cp**subject coordinator: tba*

This subject will introduce students to the language, history and culture of Australia. It will also introduce students to academic study in Australia.

**31601****Programming for Performance**

*6cp; prerequisites: 31425 Programming Software Development B or equivalent and 31429 Procedural Programming or equivalent*  
*subject coordinator:*

*Associate Professor C B Jay*

FISH is a new programming language developed at UTS which combines a high level of abstraction (no pointers!) with efficient code. Latest experiments shows quicksort in FISH is twice as fast as in C!

This subject will appeal to (computer) scientists and (software) engineers who want: broader or deeper knowledge of algorithms; exposure to the latest theoretical developments; and the opportunity to connect to an exciting research project.

Assessment will be by assignment and project. The assignment will test understanding of basic concepts. The project will implement in FISH an algorithm or software library chosen by the student in consultation with the coordinator.

**31603****3D Computer Animation**

*6cp; prerequisite: 31140 Introduction to Computer Graphics*

*subject coordinator: Dr K Suffern*

This subject covers the major areas of 3D computer animation. It provides students with the opportunity to learn a major commercial 3D modelling, animation, and rendering package. Students will also gain experience with Silicon Graphics workstations and the Irix

environment. The subject also covers the principles and practice of pre-production planning, production management, and post-production of an animation project. The subject is project-based, and each student will develop an animation of their choice.

**31605****Computer Graphics Rendering Techniques**

*6cp; prerequisite: 31140 Introduction to Computer Graphics*

*subject coordinator: Dr K Suffern*

This subject covers the major rendering techniques used for image synthesis in computer graphics: scan-line algorithms, ray tracing, and radiosity. Topics covered include shading and illumination models, the scan conversion of graphics primitives, recursive ray tracing, textures, anti-aliasing, shadows, constructive solid geometry, acceleration techniques for ray tracing, and radiosity for diffuse and specular environments.

**31606****Virtual Communities***6cp**subject coordinator:**Professor I Hawryszkiewicz*

This subject describes ways in which computer networking components can be integrated into workspaces that foster virtual communities. It first concentrates on the formation of virtual communities that focus on common interests of their members. It considers factors that influence the growth and success of such communities both within large enterprises and within widely distributed community groups. The subject then describes ways to use information technology to combine a variety of components into workspaces that support such communities.

**31696****Industrial Training (F/T)**

*Ocp; prerequisites: 31414 Information Systems; 31415 Principles of Software Development A; 31416 Computer Systems Architecture; 31417 Computing Practice; 31424 Systems Modelling; 31429 Procedural Programming; 31434 Database Design; 31436 Systems Software and Networks or equivalent*  
*subject coordinator: Mr J Underwood*

For subject details see 31697 Industrial Training (F/T).

### 31697

#### **Industrial Training (F/T)**

*Ocp; prerequisite: 31696 Industrial Training (F/T) (first semester)*

*subject coordinator: Mr J Underwood*

The first and second semesters of Industrial Training are a compulsory requirement for the course. All full-time students must enrol in these subjects and obtain a minimum of nine months of full-time employment. Students must normally have completed the equivalent of at least four full-time semesters before obtaining employment.

### 31698

#### **Industrial Training (P/T)**

*Ocp; prerequisites: see 31696*

*subject coordinator: Mr J Underwood*

For subject details see 31699 Industrial Training (P/T).

### 31699

#### **Industrial Training (P/T)**

*Ocp; prerequisite: 31698 Industrial Training (P/T) (first year)*

*subject coordinator: Mr J Underwood*

The first and second years of Industrial Training are a compulsory requirement for the course, normally taken for a total of four semesters in Stages 5 and 6. All part-time students must enrol in these subjects and obtain a minimum of 18 months of full-time employment.

### 31718

#### **Contemporary Information Technology 1**

*6cp*

*subject coordinator: Mr J Underwood*

This is a self-paced learning subject that provides basic skills students will use in a variety of other subjects and in industry – including word processing, spreadsheets, graphics, email etc. The self-paced learning will be complemented by lectures from partner organisations about the industry and the first industry semester.

### 31722

#### **Commercial Programming**

*5cp; prerequisites: 31414 Information Systems; 31415 Principles of Software Development A*

*subject coordinator: Mr J El-Den*

Commercial structured design techniques and commercial programming in either a batch or online environment. Students will be taught the design technique and language of the particular industry organisation using approved assignment work.

### 31735

#### **Information Systems and Organisation Development**

*6cp*

*subject coordinator: Mr J Underwood*

This subject introduces theories dealing with the behaviour of people in organisations, the structure of organisations, and the relation between the two. Systems thinking is used to bring these views together as a basis for organisation development in an environment changing through the influence of information systems.

### 31736

#### **Business Processes and IT Strategy**

*6cp; 3hpw*

*subject coordinators: Mr J Clark; Dr K Sayer*

This subject aims to provide students with the skills and knowledge required to creatively plan for the strategic use of information systems in organisations. Students will be provided with an awareness of the problems in developing corporate strategies in general, and information technology strategies in particular. Their skills in the selection and use of information technology planning methods will be developed. They will learn how to use methods designed to analyse and restructure organisational processes through the innovative use of information systems technology. Current proposals for organisational restructuring are introduced and evaluated through comparison with previous theories of restructuring.

**31743****Machine Learning**

*6cp; prerequisite: 31428 Quantitative Modelling*  
*subject coordinator: Dr T Osborn*

This subject is concerned primarily with machine learning: automatic construction of computable models from data. Symbolic and non-symbolic methods are studied. Topics include: statistical learning, clustering and correlations; neural networks methods; genetic algorithms; genetic programming; Shannon information; rule induction; and first-order learning.

**31744****Case-based Reasoning**

*6cp; prerequisite: 31163 Knowledge Technology*  
*subject coordinator: Dr R Rist*

This subject builds on fundamental work in knowledge technology and introduces students to the concepts of case-based reasoning. Neural architecture, human memory. Semantic nets. Memory indexing. Case-based reasoning: case finding, case evaluation, case adaptation, building a case base. Planning: adaptation, correctness. Case-based planning. Expectations. Explanation-based learning.

**31745****Knowledge-based Systems**

*6cp; prerequisite: 31743 Machine Learning or 31744 Case-based Reasoning*  
*subject coordinator: Dr S Prabhakar*

This subject addresses the important issues relating to the design of flexible Knowledge-Based Systems (KBS). These include understanding analytical techniques for KBS, bases for deep-level representation of the world, knowledge acquisition techniques, design principles and case studies of how these principles are implemented in the current KBS.

**31746****Artificial Intelligence Applications**

*6cp; prerequisite: 31743 Machine Learning or 31744 Case-based Reasoning*  
*subject coordinator: Dr S Prabhakar*

This subject builds on fundamental work in knowledge technology and introduces students to issues in building a substantial artificial intelligence system. Use of artificial intelligence languages. Knowledge acquisition. Application selection. Knowledge engineering, computer-assisted knowledge

engineering. Designing for maintainability. Truth maintenance systems. Review of artificial intelligence applications.

**31748****Programming on the Internet**

*6cp; prerequisite: 31436 Systems Software and Networks*  
*subject coordinator: Mr N Hamilton*

This subject covers programming in Java, web site administration, HTML authoring, CGI programming and network security.

**31749****Internet Commerce**

*6cp*  
*subject coordinator: Mrs E Lawrence*

This subject aims to give students exposure to Internet commerce and will develop an understanding of the stakeholders and their capabilities and limitations in the strategic convergence of technology and business. Topics will include business models for Internet commerce, security, and legal and ethical issues. Students will develop skills in identifying the advantages and disadvantages of the various electronic payment options. Students will complete computer-based activities on Internet commerce.

**31750****Intelligent Agents in Java**

*6cp; prerequisite: either 31748 Programming on the Internet or an equivalent knowledge of programming in Java*  
*subject coordinator: Professor J Debenham*

This subject introduces students to the concepts of agent computing, and applies those concepts in the context of intelligent internet-based systems. Students will gain sufficient knowledge to be able to take more specialised subjects in Internet-based computing and artificial intelligence. By the end of this subject, the students should be able to design a simple intelligent agent and to implement a simple intelligent agent in Java.

### 31756

#### **Project Management**

*5cp; prerequisite: 31444 Systems Design and Development*

*subject coordinator:*

*Associate Professor D Wilson*

Provides students with the practical knowledge and skills that are necessary to effectively manage project teams and software development projects. The major topics are: planning a software project; software time and cost estimation; controlling a software project; development aids and alternatives; and leadership and people management. This subject will provide an essential understanding of project management issues and identify the knowledge required of a project manager in the IT industry.

### 31769

#### **Contemporary Information Technology 2**

*4cp; prerequisite: 31718 Contemporary Information Technology 1*

*subject coordinator:*

*Associate Professor D Wilson*

This subject covers topical issues in the development and implementation of information systems, and the professional ethics of software developers.

### 31770

#### **Industry Project 1**

*5cp*

*subject coordinator: Mr B Wong*

Provides students with an understanding of the function of the Information Systems Department in an organisation and also of at least one user business function serviced by IS. Understanding is developed through a number of strategies such as interviewing, observation and work experience. Students will be taught human communication skills in conjunction with the project work, with a special emphasis on oral and written communication. Training will also be provided in a variety of development tools used in the information systems development process in order to build up a defined skills profile in conjunction with the subject 31790 Industry Project 2.

### 31771

#### **Business Requirements Analysis**

*5cp; prerequisite: 31414 Information Systems subject coordinator: Mr J Clark*

Applications of systems analysis (data flow diagrams, relational modelling etc.) in a business setting; the roles of the business analyst and the systems analyst; systems research and requirements analysis (interviewing, document analysis etc.) for data processing, management information systems etc. top-down enterprise-wide perspective; evolution of the business environment; business, product and other life cycles. Industry case studies.

### 31777

#### **Human-Computer Interaction**

*6cp; prerequisite: 31444 Systems Design and Development or equivalent*

*subject coordinator: Dr T Robinson*

Focuses on human factors and information systems aspects of user-centred systems development and design. Provides students with HCI principles, concepts, tools and techniques needed to build user-centred systems, particularly in terms of the design of interfaces that satisfy user needs and create usable products that support user tasks and goals. Major topics include: the role and scope of HCI; HCI methods such as requirements analysis, task analysis and usability testing; usability evaluation; and user-centred design support.

### 31778

#### **Resources Management for IT Professionals**

*6cp*

*subject coordinator:*

*Associate Professor D Wilson*

Aims to instil the knowledge and skills required for effective management of hardware and software resources within an information systems organisation. The major topics include: resource acquisition; developing software; workplace environments; hardware and software security; operations management; and EDP accounting.

### 31779

#### **Applications of Information Technology 1**

*5cp; prerequisite: 31414 Information Systems subject coordinator: Mr C S Johnson*

Formal and practical exposure to, and understanding of, a variety of specific applications of information technology, such as management information systems, databases, decision

support systems, process control, graphics etc. Subject material will complement that of 31789 Applications of Information Technology 2 to ensure a common level of experience for all students. This is an industry subject for BInfTech.

### 31781

#### Business Systems Design

*5cp; prerequisite: 31424 Systems Modelling or 31641 Systems Design*  
*subject coordinator: Mr J Underwood*

Understanding systems design in a business setting; performance and quality criteria; alternative implementation strategies; approaches to systems construction and estimation (including package evaluation and prototyping); implementation issues; productivity issues; methods engineering; information technology in business; industry and product differences. Case studies. This is an industry subject for BInfTech.

### 31789

#### Applications of Information Technology 2

*5cp; prerequisite: 31779 Applications of Information Technology 1*  
*subject coordinator: Mr C S Johnson*

Formal and practical exposure to, and understanding of, a variety of specific applications of information technology, such as management information systems, databases, decision support systems, process control, graphics etc. Subject material will complement that of 31779 Applications of Information Technology 1 to ensure a common level of experience for all students.

### 31790

#### Industry Project 2

*5cp; prerequisite: 31770 Industry Project 1*  
*subject coordinator: Mr B Wong*

Students gain practical 'hands-on' experience of the role of members of an information systems development team in relation to business organisational goals and objectives; students are incorporated as members of a project team in a sponsoring company. Training will also be provided in a variety of development tools in order to build up a defined skills profile in conjunction with the subject 31770 Industry Project 1.

### 31860

#### Object-oriented Programming and C++

*6cp; prerequisites: 31424 Systems Modelling; 31429 Procedural Programming or equivalent*  
*subject coordinator: Dr K Sufferm*

Introduces C++ as a language to implement object-oriented programming. The subject covers objects, classes, inheritance, polymorphism and memory management in C++. Students will build upon their object-oriented experience in Eiffel, and their syntax knowledge of C.

### 31876

#### Operating Systems Facilities

*6cp; prerequisite: 31436 Systems Software and Networks or equivalent*  
*subject coordinator: Dr B Howarth*

The development of applications to make use of the facilities offered by an operating system offering support for a graphical user interface, such as Microsoft Windows or Macintosh, will be covered. Included is the methodology involved in building applications that are driven by user actions such as the mouse as well as input from a keyboard. Issues related to inter-application communication will also be explored.

### 31902

#### Auditing the Computer

*6cp; prerequisite: 22615 Accounting Information Systems*  
*subject coordinator: Mr P Bebbington*

Audit concepts and techniques in the EDP audit field. Control measures that must be embedded in computer accounting and information systems. Different systems of control: administrative, operational and security. Audit techniques and the DP audit function. Risk analysis, quality assurance.

The emphasis is oriented to control measures possible and desirable in various computer systems e.g. billing, creditors, payroll etc. and non-monetary information systems.

### 31904

#### Systems Programming

*6cp; prerequisite: 31429 Procedural Programming*  
*subject coordinator: Mr U Szewcow*

This subject enhances the student's C and UNIX system knowledge. The student learns advanced C features, UNIX system calls, system utilities, shell and perl programming.

**31916****Cognitive Modelling***6cp**subject coordinator: Dr R Rist*

This subject examines recent developments in cognitive science. It brings together research from: psychology, neurophysiology, philosophy and AI. It investigates mechanisms and models underlying intelligent and adaptive behaviour with a view to their use in system design. Topics include philosophy of mind, learning paradigms, memory systems, attention, neurophysiology, neural assemblies, feature discovery and identification, physical symbol hypothesis and Human Information Processing, and AI technologies.

**31917****Commercial Programming in Cobol***6cp; prerequisite: 31429 Procedural**Programming or equivalent**subject coordinator: Mr J El-Den*

Top-down structured program design techniques, and their application to the development of commercial programming applications. The emphasis will be on the quality and usability of the resultant systems. Debugging and testing skills will be developed. The language used will be COBOL.

**31919****Distributed Software Programming***6cp; prerequisites: 31436 Systems Software and Networks or equivalent; and 31904 Systems Programming or equivalent**subject coordinator: Mr U Szewcow*

This subject builds on material learned in 31436 Systems Software and Networks and 31904 Systems Programming. Students apply the knowledge and skills obtained in those subjects to explore the design and construction of Distributed Software Applications. Skills in the use of network communication libraries, thread and RPC libraries are developed. At the present time, the C language and the UNIX environment are used.

**31921****Objectbases***6cp; prerequisite: 31434 Database Design**subject coordinator: Dr G Feuerlicht*

This subject introduces the students to OODB concepts. We review the basic OO principles and discuss their application to databases. The

theoretical discussion of the topic will be supported with practical exercises using a commercially available OODBMS.

**31922****Object-oriented Methodologies***6cp; prerequisite: 31424 Systems Modelling**subject coordinator:**Professor B Henderson-Sellers*

This subject introduces the object-oriented methods of analysing the problem domain and creating an implementation-independent formal representation of the system requirements. Elements of the object-oriented analysis (OOA) process, OOA representation and OOA complexity management are introduced and compared with the related concepts of structured analysis methodologies. The differences between the two approaches, and the advantages and disadvantages of each of them, are discussed. Various object-oriented modelling methodologies are compared and their applicability to different application domains is assessed. The transition from implementation-independent results of the OOA to the object-oriented design (OOD) for different implementation platforms is also covered.

**31924****Performance Modelling***6cp; prerequisites: 31432 Systems Software and Networks; 31428 Quantitative Modelling; 31696-7 or 31698-9 Industrial Training**subject coordinator: Dr B Howarth*

This subject teaches the concepts and practice of mathematical modelling for discrete-event systems. Students will gain experience in applying queuing theory models and discrete-event simulations to computer systems, and analysing the results. An important application of modelling is capacity planning, and students will be introduced to this topic.

**31925****Smalltalk***6cp; prerequisites: 31415 Principles of Software Development A; 31424 Systems Modelling**subject coordinator: Dr S Prabhakar*

This subject provides an introduction to the Smalltalk programming language and environment. Topics include the syntax and semantics of Smalltalk, the Smalltalk programming tools, the Smalltalk class library, Smalltalk programming style and design, and adding graphical interfaces to Smalltalk programs.

**31927****Applications Development with Visual Basic**

*6cp; prerequisites: 31414 Information Systems and one of 31415 Principles of Software Development A or 31429 Procedural Programming; corequisite: 31424 Systems Modelling or 31434 Database Design*  
*subject coordinator: Mr J Underwood*

This subject introduces event-driven programming. Students will learn Visual Basic and use it to build an interactive system. The system will be designed using dialogue-oriented prototyping. Students will also learn how to connect to various application packages using OLE.

**31928****Applications Development with Delphi**

*6cp; prerequisites: 31414 Information Systems and one of 31415 Principles of Software Development A or 31429 Procedural Programming; corequisite: 31424 Systems Modelling or 31434 Database Design*  
*subject coordinator: Mr P Bebbington*

This subject aims to give students exposure to the development of user-orientated databases using visual programming languages. Students will be required to apply software tools and packages which have different strengths and weaknesses to create an application. The technical environment for this subject is Borland Delphi and a database package.

**31931****Software Quality Assurance**

*6cp; prerequisite: 31424 Systems Modelling or equivalent*  
*subject coordinator: Mr C S Johnson*

Aims to provide students with the practical knowledge and skills that are necessary to effectively measure and control the quality of software products. Major topics include: quality assurance principles; quality metrics; verification, validation and testing; implementing quality assurance, and software engineering methods and tools.

**31945****Introduction to Computing Research**

*6cp*  
*subject coordinator: tba*

This subject introduces Honours students to the nature of computing research, and some of the techniques used in various areas of computing research.

**31946****The Computing Literature**

*6cp*  
*subject coordinator: tba*

This subject introduces students to the range of literature available on computing and information systems, and teaches students how to use the literature for research purposes.

**31947****Honours Research Project**

*24cp; prerequisites: 31945 Introduction to Computing Research; 31946 The Computing Literature*  
*subject coordinator: tba*

The project entails a substantial investigation, under the supervision of a member of academic staff. It is examined on the quality of both a written report and oral presentation of the project work.

**31948****Honours Seminar 1**

*6cp*  
*subject coordinator: tba*

Students will combine self-directed study and tutorial sessions to extend their knowledge about a particular area of information technology.

**31949****Honours Seminar 2**

*6cp; prerequisite: 31948 Honours Seminar 1*  
*subject coordinator: tba*

Students will combine self-directed study and tutorial sessions to extend their knowledge about a particular area of information technology.

**31950****Networked Enterprise Design**

*6cp*  
*subject coordinator: Professor I Hawryszkiewicz*

This subject describes evolution of systems towards distributed environments with more emphasis on working together over distance. It describes how people work together and the changes to work practices resulting from the distribution of such work, including telework and mobile workers. The subject covers collaboration technologies such as email, video-conferencing, co-authoring and workflows, needed to support distributed work. The subject emphasises the design process,

describing how to choose and implement collaborative technologies based on systems such as the World Wide Web or Lotus Notes to meet the needs of distributed groups across organisations, as well as within organisations.

### 32106

#### Object-oriented Software Development

6cp

*subject coordinator:*

*Professor B Henderson-Sellers*

Basic principles of object-oriented software development. Classes as modules and classes as types. OO analysis and design. Software design as object modelling through abstract data type definition. Design by contract and subcontracting. The different forms of inheritance. OO programming. Software development environments. Support for OO methods and techniques. OO models of the software development process. Project management for OO. Models of application domains as the basis for OO frameworks for fast application development.

### 32108

#### Applications of Artificial Intelligence

6cp

*subject coordinator: Professor J Debenham*

This subject covers some important areas of artificial intelligence and their applications. These areas include, broadly: knowledge representation; problem solving; planning; knowledge-based systems; dealing with uncertainty; explanation facilities; machine learning and applications of AI. The subject quickly introduces students to the basic AI techniques and then deals with individual topics in depth.

### 32204

#### Advanced Data Management

6cp

*subject coordinator: Dr G Feuerlicht*

This subject covers a range of advanced database topics, including relational, object-oriented database systems and distributed databases. The subject area is treated mainly from a technological viewpoint, but also includes a discussion of management issues.

### 32208

#### Information Processing Strategy

6cp; *prerequisite: 32207 Information Management*

*subject coordinator:*

*Associate Professor D Wilson*

This subject is designed to provide students with an awareness of the problems in developing corporate strategies for information processing, and to develop skills in the selection and use of appropriate techniques.

### 32307

#### Operating Systems

6cp

*subject coordinator: Associate Professor T Hintz*

Topics in modern operating systems: concurrency in multiprocessor operating systems, programming support environments, user friendly system interfaces, object-based systems, fault tolerant systems, and secure systems.

### 32501

#### Computer Graphics

6cp

*subject coordinator: Dr K Suffern*

Demonstrates why computer graphics are important and, through the lectures and practical work, gives students a working knowledge of elementary two and three-dimensional graphics programming algorithms.

### 32509

#### Human-Computer Interaction in Information Systems

6cp

*subject coordinator: Dr T Robertson*

Introduces students to the fundamental knowledge required to understand the nature and scope of HCI; the contribution to HCI of human factors, language and communication; ergonomics; and the role of HCI in the software and systems design and development processes. Approaches to incorporate HCI into the software design and systems development processes will be examined with an emphasis on how HCI can ensure more usable software and systems.

**32511****Principles of Object-oriented Programming in Smalltalk**

*6cp; prerequisite: 32106 Object-oriented Software Development*

*subject coordinator: Dr S Prabhakar*

The Smalltalk language and programming environment are covered in the first half of the subject. The second half uses the Smalltalk class library to build an interactive system with a graphical user interface (GUI).

**32513****Advanced Machine Learning**

*6cp; prerequisite: 32512 Advanced Knowledge Technology*

*subject coordinator: Dr T Osborn*

This subject is concerned primarily with machine learning: automatic construction of computable models from data. Symbolic and non-symbolic methods are studied. Topics include: statistical learning, clustering and correlations; neural networks methods; genetic algorithms; genetic programming; Shannon information; rule induction; and first-order learning.

**32516****Internet Programming**

*6cp*

*subject coordinator: Mr N Hamilton*

Internet Programming covers programming in Java, web site administration, HTML authoring, CGI programming and network security. Students implement a system, preferably in their work environment, that interfaces a database to the World Wide Web using Java.

**32517****Commerce on the Internet**

*6cp*

*subject coordinator: Mrs E Lawrence*

This subject aims to give students exposure to Internet commerce and will develop an understanding of the stakeholders and their capabilities and limitations in the strategic convergence of technology and business. Topics will include business models for internet commerce, security, and legal and ethical issues. Students will develop skills in identifying the advantages and disadvantages of the various electronic payment options. Students will complete computer-based activities on internet commerce.

**32518****Internetworking Research**

*6cp; prerequisite: subjects in Graduate Diploma in Internetworking*

*subject coordinator: tba*

This subject will familiarise students with a range of approaches used in IT research, with particular emphasis on industry approaches. The advantages and limitations of different research approaches will be examined, as well as their applicability in internetworking environments, especially in the student's own workplace. Experience will be provided in the design of research studies, the analysis and interpretation of data and report presentation and in critical analysis of others' research.

**32519****Internetworking Project (18cp)**

*18cp; prerequisite: 32518 Internetworking Research*

*subject coordinator: tba*

Students will undertake a project in an area of internetworking and prepare a project report.

**32520****UNIX Systems Administration**

*6cp*

*subject coordinator: Dr B Howarth*

Students will learn about basic UNIX systems administration, including: registering users; file systems; networking; and performance management. Students will be presumed to be competent users of UNIX. There will be a laboratory component to the subject.

**32521****Internetworking**

*6cp; prerequisite: 32524 LANs and Routing*

*subject coordinator: Mr U Szewcow*

This subject extends the work covered in 32524 LANs and Routing with VLANs and WAN protocols. WAN and LAN network design is introduced: Use of the UTS Cisco Academy resources are used for practical work and threaded case study. After completing this subject the student may sit for the industry certification CCNA (Cisco Certified Network Associate).

### 32522

#### **C for Systems Programmers**

6cp

*subject coordinator: Mr U Szewcow*

This subject develops skills in programming 'system level' code in C. UNIX shell programming and use of UNIX utilities is practiced.

### 32523

#### **Operating Systems for Internetworking**

6cp

*subject coordinator: Associate Professor T Hintz*

This subject looks at the principles of operating systems and the fundamental differences between systems currently used in internetworking, such as UNIX and NT.

### 32524

#### **LANs and Routing**

6cp; *prerequisite: 32523 Operating Systems for Internetworking*

*subject coordinator: Mr U Szewcow*

This subject provides students with knowledge of LAN hardware and physical layer standards, and basic computer networking concepts and principles, and introduces local area network design and the use of routers and routing in autonomous system intranets. It also explains how these access WANS. Use of the Cisco Academies on-line resources and practical work in wiring and configuring LANs, including Cisco routers, is an integral part of this subject.

### 32525

#### **Distributed Software Programming**

6cp; *prerequisite: 31904 Systems Programming or equivalent*

*subject coordinator: Mr U Szewcow*

This subject builds on material learnt in 31510 Operating Systems. It furthers an understanding of the underlying technology used in implementing distributed systems software. Students design and develop distributed applications.

### 32526

#### **Designing the Networked Enterprise**

6cp; *prerequisite: 32607 Systems Analysis or equivalent*

*subject coordinator:*

*Professor I Hawryszkiewicz*

This subject describes evolution of systems towards distributed environments with more emphasis on working together across distance. It describes how people work together and the changes to work practices resulting from distribution of such work, including telework and mobile workers. The subject covers collaboration technologies such as email, video-conferencing, co-authoring and workflows, needed to support distributed work. The subject emphasises the design process, describing how to choose and implement collaborative technologies based on systems such as the World Wide Web or Lotus Notes to meet the needs of distributed groups both across organisations as well as using Intranets within organisations.

### 32527

#### **Internetwork Design**

6cp; *prerequisite: 32524 LANs and Routing*

*subject coordinator: tba*

This subject combines the principles studied in 32524 LANs and 32521 Routing and Internetworking and extends them. These are then applied to the design of internetworks.

### 32528

#### **Network Management**

6cp; *prerequisite: 31436 Systems Software and Networks*

*subject coordinator: Mr J Colville*

Instruction in network concepts, and the concepts and practical issues of network management. Students will have access to a laboratory where aspects of network management can be tried out in a practical way.

### 32529

#### **Internetworking Project (12cp)**

12cp; *prerequisite: 32518 Internetworking Research*

*subject coordinator: tba*

Students will undertake a project in an area of internetworking and prepare a project report.

**32530****Building Intelligent Agents***6cp**subject coordinator: Professor J Debenham*

This subject introduces students to the concepts of agent computing, and applies those concepts in the context of intelligent Internet-based systems. Students will gain sufficient knowledge to be able to take more specialised subjects in internet-based computing and artificial intelligence. By the end of this subject, the students should be able to design a simple intelligent agent and to implement a simple intelligent agent in Java.

**32531****Global Information Systems***6cp**subject coordinator: Dr V Gay*

This subject covers new requirements placed on information systems arising out of the globalisation of business operations. It covers new ways of doing business in global environments, including formation of alliances and joint ventures, and ways that information systems must be developed to support them. The interaction of technical issues and social issues, including culture, will be studied.

**32532****Conducting Business Electronically***6cp**subject coordinator:**Professor I Hawryszkiewicz*

This subject will describe ways to assess an organisation's computer networking needs and identify those business operations that will benefit most from using Web or groupware technologies in business-to-business and intranet applications. It will then cover ways for designing the applications by specifying workspaces that allow users to share information and knowledge while working towards organisational goals. Different kinds of workspaces will be identified, including those for information exchange, developing personal relationships and knowledge sharing. Ways of using Web technologies to implement the workspaces will then be described.

**32533****Networking Communities***6cp**subject coordinator:**Professor I Hawryszkiewicz*

This subject describes ways in which computer networking components can be integrated into workspaces that foster virtual communities. It first concentrates on the formation of virtual communities that focus on common interests of their members. It considers factors that influence the growth and success of such communities both within large enterprises and within widely distributed community groups. The subject then describes ways to use information technology to combine a variety of components into workspaces that support such communities.

**32534****Knowledge Management***6cp**subject coordinator: Professor J Debenham*

This elective subject addresses the business of managing the generation, dissemination, retention, application and development of corporate knowledge. It addresses knowledge discovery in databases which is the non-trivial process of identifying valid, novel, potentially useful, and ultimately understandable patterns in data.

**32535****Databases in Distributed Environments***6cp**subject coordinator: Dr G Feuerlicht*

This subject covers a range of topics in distributed databases. The main topics include: discussion of distributed database design; distributed transactions and queries; and data replication strategies. Modern database server techniques are introduced.

**32536****Systems Development (Objects and Processes)***6cp**subject coordinator:**Professor B Henderson-Sellers*

Basic principles of object-oriented software development. Classes as modules and classes as types. OO analysis and design. Software design as object modelling through abstract data type definition. Design by contract and

subcontracting. The different forms of inheritance. OO programming. Software development environments. Support for OO methods and techniques. OO models of the software development process. Project management for OO. Models of application domains as the basis for OO frameworks for fast application development.

### 32537

#### Enterprise Wide Software Systems

6cp

*subject coordinator:*

*Professor B Henderson-Sellers*

This subject looks at software from an enterprise point of view. It investigates issues concerning the incorporation of legacy code versus a new system, maintenance, costs, the effect of a business re-engineering process on software systems, or the opportunities provided by the necessity to introduce new systems.

### 32541

#### Project Management

6cp

*subject coordinator: Dr K Sayer*

This subject covers the management of the development and implementation of information technology solutions, with particular emphasis on information systems, project management, and contemporary issues in the delivery of information technology solutions to the business. It considers the role of project management in business and identifies the managerial control and reporting aspects necessary from inception to implementation of a software development project.

### 32542

#### Advanced Cognitive Modelling

6cp

*subject coordinator: Dr T Osborn*

Designed to provide an overview of recent developments in the exciting field of cognitive science. Bringing together work from several disciplines, including psychology, neurophysiology, philosophy and AI, this subject will investigate the biological mechanisms underlying human intelligence in order to provide a theoretical model for emulating such behaviour artificially. Topics include: philosophy of mind; memory systems; selective attention; learning; and emerging AI techniques such as neural networks.

### 32543

#### Advanced 3D Computer Animation

6cp; *prerequisite: 32501 Computer Graphics*

*subject coordinator: Dr K Sufferm*

This subject covers the major areas of 3D computer animation. It provides students with the opportunity to learn a major commercial 3D modelling, animation and rendering package. Students will also gain experience with Silicon Graphics workstations and the Irix environment. The subject also covers the principles and practice of pre-production planning, production management and post-production of an animation project. The subject is project-based, and each student will develop an animation of their choice.

### 32544

#### Advanced Image Synthesis Techniques

6cp; *prerequisite: 32501 Computer Graphics*

*subject coordinator: Dr K Sufferm*

This subject covers the three major rendering techniques used for image synthesis in computer graphics: scan-line algorithms, ray tracing and radiosity. Topics covered include: shading and illumination models, the scan conversion of graphics primitives, recursive ray tracing, textures, anti-aliasing, shadows, constructive solid geometry, acceleration techniques for ray tracing, and radiosity for diffuse and specular environments.

### 32545

#### Multi-Agent Systems

6cp

*subject coordinator: Professor J Debenham*

This subject aims to introduce students to current research and state-of-the-art applications of multi-agent technology, and to teach them how to recognise a problem that should be addressed by multi-agent technology.

### 32546

#### Business Process Engineering

6cp

*subject coordinator: Dr K Sayer*

This subject aims to introduce current approaches to modelling process; designing, implementing and maintaining business process systems; and current approaches to managing process systems and to managing the application of business process engineering technology.

**32601****Advanced Project Management***6cp**subject coordinator:**Associate Professor D Wilson*

Provides an essential understanding of advanced project management issues and identifies the knowledge required of a project manager in the information technology industry.

**32602****Impact of Information Technology***6cp**subject coordinator:**Associate Professor D Wilson*

Reviews the effect of the introduction of computer technology into workplaces, improved efficiency of work organisations, increased occupational health hazards for computer terminal operators, and increased potential for computer crimes. Physical, psychological and environmental factors that contribute significantly to conditions such as RSI are explained in depth. The effects of information technology on employment patterns are examined. Computer crime is defined and categorised, and the difficulties associated with its prevention and detection, and with subsequent legal actions, are discussed. Measures to ensure the protection of privacy are explained in this unit.

**32604****Systems Integration**

*6cp; prerequisite: 32601 Advanced Project Management*

*subject coordinator: Dr G Feuerlicht*

Systems integrators are facing new challenges as a result of the increasing complexity of information systems and the fast evolving technologies used in their construction. This subject introduces students to various topics relating to systems integration. The subject covers both the technological and management issues in this area. The focus is on frameworks, architectures, and standards that facilitate component-based systems integration.

**32605****Managerial Analysis and Evaluation of Information Systems***6cp**subject coordinator: Mr B Wong*

Presents a range of fundamental accounting, risk-analysis and performance criteria for information systems. This subject is intended to provide basic skills in evaluating computer-based information systems. For students who are involved in management, it is important that they are aware of what information systems can provide, how to rate them and how to specify their requirements for their organisation's advantage.

**32701****Advances in Information Technology***6cp**subject coordinator: tba*

Looks at the technology trends affecting information processing and delivery, to provide the student with the vision to ensure that not only is their company well served in the present by its technology environment, but that it is also able to take up the opportunities of the future.

**32702****Contemporary Telecommunications***6cp**subject coordinator: Dr V Gay*

Introduction to data communications and networks. Network architecture and standards. New communications technologies. Internetworking. Domestic and international communications environments. Application-oriented services. Network resource architectures. Client/server systems. Introduction to distributed processing. Distributed databases. Emerging technologies. Business and telecommunications planning.

**32703****Information Technology Strategy***6cp**subject coordinator: Professor L Constantine*

Designed to provide students with an awareness of the problems in developing corporate strategies for information processing, and to develop students' skills in the selection and use of appropriate techniques.

**32704**

**Strategic IT Contract Management**

*6cp*

*subject coordinator: Mr N Hamilton*

Designed to provide students with an understanding and practical knowledge of IT contracting and intellectual property laws relating to the IT industry, and of implementing contract design and negotiation strategies to achieve project objectives.

**32806**

**Project A**

*6cp; prerequisite: Graduate Diploma in*

*Information Technology Management;*

*corequisite: 21751 Management Research Methods*

*subject coordinator: Dr J Feuerlicht*

See 32812 Project B below.

**32812**

**Project B**

*6cp; prerequisites: 32806 Project A;*

*21751 Management Research Methods*

*subject coordinator:*

*Associate Professor D Wilson*

All students in the MBus in IT Management are required to enrol in and pass the project subjects. The project is normally undertaken in the final year of study. The project entails a substantial investigation, under the supervision of a member of the academic staff, and is examined on the quality of both a written report and an oral presentation of the project work. The oral presentation must be made in the final year of enrolment in the Master's course and must be presented at a satisfactory standard. Expert speakers may be available to present Master's seminars as required throughout the final year of the course. Students are required to attend the Master's seminars.

**32910**

**Project 1**

*6cp*

*subject coordinator: Professor J Debenham*

The project is split into two subjects. In the first, students will learn about the nature of research: both academic and professional. A variety of appropriate research methodologies will be presented. The subject will also cover the cost of research; evaluation of research; significance of research; timeliness of research; and execution of a research project. Students will be required to present a substantial literature survey and workshop a research proposal. In the second subject, the student will undertake a substantial investigation under the supervision of a member of staff, which is examined on the quality of both the written work and a research seminar.

**32911**

**Project 2**

*6cp*

*subject coordinator: Professor J- Debenham*

The project is split into two subjects. In the first, students will learn about the nature of research: both academic and professional. A variety of appropriate research methodologies will be presented. The subject will also cover the cost of research; evaluation of research; significance of research; timeliness of research; and execution of a research project. Students will be required to present a substantial literature survey and workshop a research proposal. In the second subject, the student will undertake a substantial investigation under the supervision of a member of staff, which is examined on the quality of both the written work and a research seminar.

## SUBJECTS OFFERED BY OTHER FACULTIES

Students should consult the relevant faculty and its handbook for any late changes to subject information.

### 015110

#### Aboriginal Cultures and Philosophies

8cp

This subject will introduce participants to Aboriginal culture and social organisation as expressions of Aboriginal cosmology. Contemporary Aboriginal culture will be presented as an evolving response to colonialism and as a reassertion of cultural empowerment.

### 21751

#### Management Research Methods

6cp; prerequisite: Graduate Certificate in Information Technology Management  
subject coordinator: Dr J Crawford

This subject will familiarise IT managers with a range of approaches used in management research, with an emphasis on approaches commonly used in practical settings. Advantages and limitations of different research approaches will be examined, as well as their applicability in different IT contexts. Experience will be provided in the design of research studies, in the analysis and interpretation of data, and in report presentation. Participants will acquire skills which will be useful in the conduct of research agendas in their own IT organisations, and in the critical evaluation of others' research work.

### 21788

#### Effective People Management

6cp

subject coordinator: Mr R Connor

Deals with a range of management skills, competencies and understandings necessary for effective people management. It seeks to develop enhanced competence in managing others and, recognising the importance of continuing personal learning and development in management, seeks to develop an increased sensitivity and understanding of self and others in organisational contexts.

### 21789

#### Contemporary Management Practices

6cp

subject coordinator: Mr R W Connor

This subject addresses a range of management practices appropriate to contemporary organisations. The unit provides students with an understanding of key aspects of current management practices, including: managerial relationships; intercultural management; leadership, status and power; negotiation; interviewing; team building; managerial audits; and managerial ethics.

### 21806

#### Managing Organisational Change

6cp

subject coordinator: Dr K Sayer

This subject examines the role of the manager in planning and facilitating change in an IT environment, as well as the managerial challenges to be faced. It explores and suggests organisational change interventions. Change issues relevant to IT, such as technology assessment, will receive special emphasis.

### 21807

#### Total Quality and Productivity Management

6cp; prerequisite: Graduate Certificate in Information Technology Management  
subject coordinator: Mr D Davis

Productivity and quality are both key factors in successful performance in the IT industry. This subject aims to develop a clear understanding of the practical and managerial aspects of quality management and productivity management, including the fundamentals of TQM and its relationship to productivity. Students completing this subject will have a sound philosophical and practical basis for evaluating productivity and quality improvement programs and total quality implementation programs.

### 21808

#### Strategic Business Management

6cp; prerequisites: Graduate Certificate in Information Technology Management;  
21806 Managing Organisational Change  
subject coordinator: Mr A Hermans

The nature of strategic issues; arenas of strategy; the information technology industry: context and issues; concepts of strategy; environmental analysis; capability analysis;

## 140 Subject descriptions

development of strategic alternatives; evaluation and choice of strategic alternatives; stability, change and transformation; the process of strategy implementation; and strategic control and monitoring.

### 22105

#### Accounting A

4cp; 3hpw

This subject provides an introduction to accounting, setting out the nature of accounting and its relationships together with double entry bookkeeping's unique ability to record market activity. The body of the course deals with the accounting process (journals to ledger), double entry bookkeeping, the definition of the elements of financial statements, using control accounts, control of cash, using accrual accounting, inventory, non-current assets, preparation of financial statements, and the so-called limitations of the historical cost model.

### 22615

#### Accounting Information Systems

6cp

subject coordinator: Mr G Lowe

This subject presents a range of fundamental accounting principles. This subject is intended to provide basic skills in financial accounting and to apply this knowledge of accounting to evaluating computerised accounting systems. An accounting system is an example of an information system.

### 22746

#### Managerial Accounting

Postgraduate

6cp

subject coordinator: Dr Andrew Chew

Management accounting information systems are one of the main decision-support systems in organisations. This subject equips students with the skills and knowledge to design and use effective management accounting information for planning and controlling organisational activities. Topics include: absorption costing; cost behaviour and cost-volume-profit analysis; budgetary planning and control; differential costs; activity-based costing; and standard costing and variance analysis.

### 22747

#### Accounting for Managerial Decisions

Postgraduate

6cp

subject coordinator: Mr Laszlo Moysa

Introduces students to the basics of financial and management accounting. Topics include: the nature and purpose of accounting – accounting reports (balance sheets, profit and loss statements, cash flow statements) and analysing accounting; accounting reports and financial reports – the nature of management accounting and cost concepts; strategic planning and budgeting; cost accumulation systems (traditional costing systems and activity-based costing systems); and responsibility accounting (the management control structure, and analysing and reporting on performance).

### 24105

#### Marketing Principles

4cp

subject coordinator: Mr G Taberner

This subject aims to develop an awareness and understanding of marketing concepts and how these concepts apply to profit and non-profit organisations; to provide the foundations from which a more advanced study of marketing may be pursued; to show the relevance of the need for a marketing orientation in a dynamic and changing business environment; to allow students to test and apply marketing concepts in a dynamic simulated business environment; and to develop the skills necessary to formulate a basic marketing plan. The projects also highlight the need for group decision making for effective management.

### 24704

#### Managing Client Relations

6cp

subject coordinator: Dr B Perrott

This subject reviews the nature of the business development process through focusing upon the specific needs of clients. It explores the complex issues of determining and focusing on client needs as a key activity for IT managers who wish to maximise their impact. Specific IT-based case material will be used throughout the course to ensure that participants recognise the essential relationship between product and client satisfaction.

**25110****Microeconomics***4cp; 3hpw*

Basic market theory. Demand theory. Elasticity of demand. Short-run cost theory. Short-run supply theory, long-run cost theory. Resource market theory. Perfect and monopolistic competition. Oligopoly and monopoly. Firm behaviour, theory of competition policy. Theory of trade. Market failure theory. Income redistribution. Industry policy, regulation.

**25209****Macroeconomics***4cp; 3hpw; prerequisite: 25110 Microeconomics*

Inflation and unemployment. Aggregate supply and demand. National accounts. Elementary income determination theory. Interest rates and expenditure. The monetary sector. Combining money and expenditure sectors. The balance of payments. Prices, wages and the Phillip's curve. Stagflation.

**25210****Microeconomic Theory and Policy***6cp; 4hpw; prerequisite: 25110 Microeconomics*

The need for public regulation and/or control of business activity. Microeconomic policy formulation, theory of firms and markets, restrictive trade practices, consumer protection, small business. Industry policy, tariffs and structural change. Foreign investment. Resources policy.

**25308****Financial Markets***4cp; 3hpw*

Financial intermediation. Interest rate determination. Financial market theory, bond pricing, foreign exchange market futures, options and swaps. The financial system and the Reserve Bank. Introduction to banking. Equity market.

**25314****Business Finance***4cp; 3hpw; prerequisites: 22105 Accounting A; 35151 Statistics 1; corequisite: 25308 Financial Markets*

Consumption/investment decision: the investment decision and techniques for evaluation. Factors affecting investment: the concept of risk, the pricing of risk, investment decisions

under risk, the financing decision. Sources of finance, leasing. Capital structure theories, dividend policy.

**25421****International Financial Management***6cp; 4hpw; prerequisites: 25308 Financial Markets; 25314 Business Finance*

International financial management, the mechanics and functions of foreign exchange markets, exchange rate determination and parity relationships, forecasting, measurement of foreign exchange risk, multinational working capital management, trade finance, financing foreign operations, long-term asset and liability, international taxation management.

**25606****Financial Time Series Analysis***6cp; 4hpw; prerequisites: 35232 Advanced Calculus; 35353 Regression Analysis*

Financial returns: their definitions and behaviour. Models of price volatility. Forecasting standard deviations. Testing the random walk hypothesis. Testing the market efficiency hypothesis. Forecasting trends in prices. Valuing options.

**25620****Derivative Securities***6cp; 4hpw; prerequisite: 25906 Investment Analysis (Honours)*

Introduction to derivative securities, basic arbitrage arguments, the pricing of futures, properties of options, pricing of differing instruments, and hedging strategies using derivatives.

**25621****Financing Decisions and Capital Market Theory***6cp; 4hpw; prerequisite: 25905 Capital Budgeting and Valuation (Honours)*

Provides an understanding of the theory, empirical evidence and practice of corporate financing decisions. Critical evaluation of a company's existing capital structure and proposed methods of raising new finance. Review of theoretical and empirical research relating to the efficient market hypothesis.

**25742**

**Financial Management**

*Postgraduate*

*6cp*

*subject coordinator: Mr Rowan Trayler*

Provides the analytical framework for corporate financial decisions. Introduces students to financial theory and to the tools of financial decision making. Concerned primarily with investment project evaluation and determining the financing mix necessary to achieve the firm's financial objectives. Topics include: the conceptual basis of financial decisions; accounting statements and cash flow; net present value; the valuation of debt and equity; capital budget issues; risk and return; the capital asset pricing model (CAPM); capital structure – determinants of the optimal balance of debt and equity; dividend policy; and leasing.

**25905**

**Capital Budgeting and Valuation (Honours)**

*6cp; 4hpw; prerequisites: 25308 Financial*

*Markets; 25314 Business Finance*

The contribution of Markowitz and others to modern portfolio theory and the Capital Asset Pricing Model, including market equilibrium and efficient market assumptions; empirical tests. Relating to the Capital Asset Pricing Model and its derivatives. Arbitrage Pricing Theory. Pricing models for contingent claims, options and futures. Efficient capital markets: theory and evidence.

**25906**

**Investment Analysis (Honours)**

*6cp; 4hpw; prerequisites: 25308 Financial*

*Markets; 25314 Business Finance*

Equilibrium models. Performance measures. Pricing instruments. Options. Return profiles. Option valuation models. Market efficiency. Share market analysis. Fixed income securities. International diversification.

**25907**

**Theory of Financial Decision Making**

*4cp; 3hpw; prerequisite: by consent*

The theory of choice. State preference theory. The mean-variance criteria. Capital market equilibrium, capital asset pricing model and arbitrage pricing theory. Efficient capital markets: theory and evidence.

**25908**

**Derivative Security Pricing**

*4cp; 3hpw; prerequisite: by consent*

Introduction to derivative securities. Basic arbitrage arguments. Geometric Brownian motion model of asset pricing movements. Ito's lemma. Risk-neutral valuation and the Black-Schole's model. Currency and futures options. Hedging techniques. Interest-rate-derivative securities. Alternatives to Black-Schole's option pricing.

**25909**

**Advanced Corporate Finance**

*4cp; 3hpw; prerequisite: by consent*

A selection of the classic papers in corporate finance. Current research work, Australian empirical work. Major issues involved in the firm's investment and financing decisions, the interaction of these activities and investor behaviour in the markets for the firm's securities.

**25910**

**Thesis**

*12cp; prerequisite: by consent*

A thesis on a topic chosen by the student in consultation with his or her supervisor.

**49031**

**Information Structures, Perception and User Interface Design**

*6cp*

*subject coordinator: tba*

This subject will look at how authors will create information and how users will access it. It will introduce methodologies to structure the information to facilitate creation and access. Existing information classification and indexing schemes will be studied and extended to meet demands imposed by hypermedia systems. User interface design issues based on how we perceive and access information, and how different media can be used to effectively communicate a message, will also be studied in this subject.

**49201**

**Integrated Services Network**

*6cp*

*subject coordinator: tba*

Switching methods, CCITT recommendations, SDH, ISDN technology, ISDN signalling, broadband ISDN, ATM standards, resource

sharing and multiple access (ALOHA/CS/CD, CSMA/CD, Token Bus, Token Ring, QPSX, FFDI).

#### 49241

##### Hypermedia Technologies

6cp

*subject coordinator: tba*

This subject provides an introduction to hypermedia. It introduces basic components and the structure of hypermedia systems, underlying technologies for the capturing, compressing, structuring and authoring of different media (text, images, video and sound). Issues related to storage and transmission of large volumes of data are discussed, including temporal media synchronisation. The Internet and the World Wide Web are studied in detail.

#### 49242

##### Mono Media Technologies

6cp

*subject coordinator: tba*

This subject introduces engineering issues and state-of-the-art solutions related to the capturing, representation, storage, compression and presentation of digital media. Special emphasis is placed on images, video and audio. Topics such as colour space, image, video and audio compression techniques and standards (JPEG, MPEG), and the processing of visual information for applications such as image and video databases will be studied.

#### 49243

##### Design of Hypermedia Information Systems

6cp

*subject coordinator: tba*

In this subject, students will learn how to develop large complex hypermedia information systems that need to be maintained and updated over a period of time. Students will learn how to extract the structure of information and develop a document using SGML. Students will then develop programs to convert the marked-up documents into formats suitable for different browsers (such as HTML) and applications. The topics will also include life-cycle considerations project management in hypermedia systems development, and new technical issues such as copyright and social impact. In this subject, industry-standard application development tools will be used for practical work.

#### 50140

##### Comparative Social Change

8cp; 4hpw

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 will highlight a number of key issues, for example 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. It will be emphasised that differing interpretations of modernisation flow from various relations of power which lead to a multiplicity of views on its meanings and significance.

#### 50457

##### Theories of the Visual

8cp

*subject coordinator: tba*

This subject examines a number of different forms of visual representation (painting, photography, cinema, television, video), together with their different forms of theoretical critical description. The subject also examines the broader theoretical debates within which these forms of visual representation have been placed e.g. visual representation and the representation of history; memory; nostalgia and the visual – from the photographic image through to such things as cinematic/television documentary; recent charged historical issues such as Vietnam, the Freedom Rides, AIDS and issues of representation; and recent material on pornography and gender. Not all of these media forms, theoretical perspectives or specific issues are covered each year.

#### 51007

##### Media Studies

4cp

*subject coordinator: tba*

This subject is a broad introduction to the study of popular media (TV, film, radio) through specific case studies and texts relating to them. In any one semester, Media Studies might address itself to genres such as sitcom, independent film, art and advertising, screen music or TV game shows. Class projects are

based around specific media texts and events and can be offered in a variety of forms besides that of the essay.

**52272****Sound, Music, Noise**

8cp

*subject coordinator: tba*

This subject is an introduction to the study of sound and music in a wide range of production forms and cultural contexts. The first part of the subject is structured as an overview in synoptic form and provides a framework for studying the distinct elements of sound, music and noise. In the principal context of art practice, a difference is established between modernist and post-modernist ideas of sound. A similar difference is marked between acoustic, analogue and digital/sampling/rescripting approaches to the representation of sound. These ways of conceiving, producing and listening to sound are related to radio, music recording, film sound, media distribution systems, subjective senses of sound and to our experience of the urban and industrial environment. In a similar manner, various later aspects of the class coursework and assignments focus on the design implications of a sonorous sense of the world, whether this is expressed in an architectural vision, a broadcast production set of artefacts and institutions, or in terms of a performance system.

**52274****Sound Studies**

8cp

*subject coordinator: tba*

This subject examines the construction of voice in both poetic and technological terms, on its own and in relation to sound and music. It focuses primarily on voice and the spoken word in radio and performance, but also in other electronic media and technologies. It asks which voices are absent or silenced, and which are present in terms of social structures (sex, sexuality, gender, class, race, ethnicity and age). The effects of the structures of radio and professional values are discussed in relation to these absences and presences. There is a focus on the construction of voices and their 'authority' and 'inflection' through an examination of cultural, social and political speaking positions, rhetorics and genres.

**54101****Sound and Image**

6cp

*subject coordinator: tba*

This subject introduces students to a range of written, visual and aural products and texts in the context of the study of, predominantly, Australian culture, so as to promote discussion of the strategies underlying them. The industrial and institutional bases for the production of such texts are linked to their consequences for individuals, communities, and multi- and sub-cultural groupings. The subject consists of lecture/tutorial arrangements coupled with viewings of selected films, videos and sound works. Computer-based exercises integrate in-class teaching with students' own interests and capabilities, and a major group-based project is produced.

**54110****Media, Culture and Society**

6cp

*subject coordinator: tba*

This subject introduces some of the major theoretical approaches to the study of media and culture, and their relationship to society. It focuses on the historical development of the communication media and media theory, and of the relevant social theory. It explores different theoretical approaches to various aspects of media and cultural production, including institutional and industrial development, political economy, policy formulation and implementation, technological change, the convergence of telecommunications and broadcasting, professionalisation of the workforce and the construction of audiences.

**54116****Audiovisual Media Production**

6cp

*subject coordinator: tba*

In this subject, students will be introduced to the various image, sound and promotional industries of PR, advertising, radio, multimedia and sound. From a critical and theoretical viewpoint, students will examine historical, political, economic, cultural and technological links between these industries. Students will develop basic production skills which reflect the range of technologies, the cultural disciplines and the industrial contexts.

**54150****Computers and Print Production***4cp**subject coordinator: tba*

This is an intensive familiarisation subject for students interested in developing introductory skills relevant to other areas of the degree which utilise simple digital production technologies.

**54151****Computers and Audiovisual Production***4cp**subject coordinator: tba*

This intensive subject provides students with an introduction to thinking about and using computers in audiovisual production. Intensive workshops are used to introduce computers and audiovisual production, overviewing digital production techniques used in a variety of industrial settings. Students develop simple projects in teams using basic software.

**54153****Video Basic***4cp**subject coordinator: tba*

This subject provides a preliminary introduction to video production and to critical issues involved in the writing, design and production of film, video and television programs. It is designed for students not enrolled in the Film, Video and Television major, as a means for them to gain a basic understanding of the issues involved in moving-picture productions in the area of television journalism, documentary, drama feature and film/video advertising. Students will develop basic skills in shooting and editing video, and will work on a number of practical exercises designed to develop their skills in visual style and to develop an understanding of how film and video texts are constructed in terms of editing, camerawork and soundtrack.

**54230****Aboriginal Social and Political History***8cp*

Examines and analyses the impact of colonialism on indigenous peoples, with particular reference to the Aboriginal inhabitants of this region. The emergence of Aboriginal social and

political movements will be presented as the basis for repossession of their traditional heritage in land and culture.

**54231****Aboriginal People and the Media**

*8cp; prerequisites: 015110 Aboriginal Cultures and Philosophies; 54230 Aboriginal Social and Political History*

Familiarises students with the field of debate in relation to the representation of Aborigines in the media, and with the productions of Aboriginal media organisations. Where possible, some written, video or film production could become part of the course assessment.

**54294****Sound Design***8cp**subject coordinator: tba*

This subject aims to introduce students conceptually and technically to production for audio design and broadcast sound. Recording, interviewing, listening, editing and mixing skills are taught in a way that stresses an understanding of how operational techniques work to produce meanings in radio. Students work in a stereo digital medium. Theoretical issues important for sound and audio design, such as analogue and digital formats, listening, speaking positions, representation, professional values, and the relation between culture, aesthetics and politics of sound are introduced at this level.

**54299****NetDesign***8cp**subject coordinator: tba*

This subject is offered to students wishing to learn how to plan, design and produce creative web sites and pages for a specific client/audience or purpose. The focus of the subject is on how the critical and practical composition of digital sounds and images are constructed for specific navigational configurations within interactive multimedia formats and cultural contexts. Emphasis is placed on developing critical and aesthetic strategies for the production of various audiovisual media resources for web sites across the communication, sound and image environment. The cultural and social implications of the production and consumption of various products and services via the Internet are addressed with a view to

developing an understanding of how to best design new web sites for specific clients and audiences. Students design and produce a web site (web homepage with hyperlinks) and undertake a number of in-class exercises covering the use of PageMill, GNN Press, Shockwave and HyperText MarkUp Language (HTML), creating tags and adding in-line sound and image documents.

### 54330

#### The Politics of Aboriginal History

*6cp; prerequisites: Aboriginal Studies subjects at 100 and 200 levels*

Introduces students to the wide range of historical work by Aboriginal and non-Aboriginal people over the last three decades, and encourages students to develop skills in the critical evaluation of this work in its political and social contexts. Students will enhance their knowledge of primary research materials for the field of Aboriginal history, and will develop their skills in the analysis and use of these sources.

### 54331

#### Aboriginal Forms of Discourse

*8cp; prerequisites: 015110 Aboriginal Cultures and Philosophies; one Aboriginal Studies subject at the 200 level*

Familiarises students with a broad range of Aboriginal forms of discourse – novels, plays, films, oral narratives – and introduces them to methods of analysis, of both text and content, deriving from the disciplines of cultural studies and textual studies.

### 55902

#### Information Behaviour

*6cp*

*subject coordinator: tba*

The aim of this subject is to develop students' understanding of the information needs, motivations and behaviours of client groups. Students will identify, define and justify a client group for the purpose of providing information services and products, and will develop an information profile of the group. They will also analyse and compare models of information seeking and utilisation, and will be introduced to the characteristics which influence or predict how people react to information and information products and services.

### 55903

#### Information Production and Presentation

*6cp*

*subject coordinator: tba*

In this subject, students are introduced to theories, principles and skills relevant to the design, production, evaluation and dissemination of information products. Students will have the opportunity to work with a range of media types and formats, and to develop skills in restructuring and repackaging information to suit client needs.

### 55906

#### Organisation of Information

*6cp*

*subject coordinator: tba*

This subject examines and evaluates principles, theories and conceptual frameworks for the organisation of information and information resources for eventual retrieval in relation to a specific need. It deals with approaches to organisation and control based on intellectual content as well as those based on physical arrangement of information and information resources, against the background of a consideration of a variety of approaches to analysis.

### 55907

#### Information Retrieval

*6cp*

*subject coordinator: tba*

This subject examines the theory and practice of information retrieval. It deals with the principles on which information retrieval systems are based and the interaction between information retrieval systems and end-users. Approaches for the evaluation of information retrieval are identified and students are introduced to some information technologies commonly used by information professionals.

### 55910

#### User Documentation 1

*6cp*

*subject coordinator: tba*

This subject provides an opportunity for students to develop knowledge, skills and competencies in the translating of specialist materials for a non-specialist audience. It takes a client-oriented approach, combining information analysis techniques with writing techniques.

**55911****User Documentation 2***6cp**subject coordinator: tba*

In this subject, students will manage a small user documentation project, producing material relevant to a targeted audience. They will also discuss some of the key issues in contemporary professional practice.

**79202****Business Law***4cp; 3hpw*

Legal philosophy; legal history; constitutional law; torts; crime; property; contracts; consumer protection.

**81021****Communication Technology***4cp**subject coordinator: tba*

This subject provides an understanding of the current state of communication theory and practice with particular reference to the designer's role in shaping components of communication systems.

**81024****Computer Graphics 1***4cp**subject coordinator: tba*

This subject provides the opportunity for selected postgraduate students to apply computer techniques to specific design projects using advanced graphics/animation programs.

**81030****3D Computer Animation 2***4cp**subject coordinator: tba*

This subject develops and expands the basic knowledge of both the theory and operation of computer animation as learnt in 81925 3D Computer Animation 1, refining the different types of computer graphics in animation. The course includes the creation and manipulation of 3D images. Topics covered include: advanced computer animation systems and theory; various animation software applications; and video production techniques.

**81923****Introduction to Design Computing***4cp**subject coordinator: tba*

This subject provides students with a working knowledge of the principles and applications of computer graphics to problem solving. The graphics techniques will include paintbrush systems, typography and spreadsheets. Projects provide an introduction to micro-computers, graphics and word-processing software packages.

**81925****3D Computer Animation 1***4cp**subject coordinator: tba*

This subject equips students with the basic knowledge of both the theory and operation of computer animation and the different types of computer graphics. Topics covered include: computer animation systems; animation software; animation production; and dropping animation to videotape.

**82009****Human Factors and Design***4cp**subject coordinator: tba*

This subject provides an understanding of the current state of communication theory and practice with particular reference to the designer's role in shaping components of communication systems.

**82016****Graphic Visualisation***4cp**subject coordinator: tba*

This subject expands the awareness and ability of students with other disciplinary backgrounds to generate ideas and communicate visually through 'hands-on' experience.

**82017****2D and 3D Communication***4cp**subject coordinator: tba*

This subject introduces methods and conventions to explain design intentions through three-dimensional model forms and two-dimensional drafting techniques and processes.

## 82915

### Photography for Designers

4cp

*subject coordinator: tba*

This subject introduces students to photography and its applications to enhance the communication of design projects.

## 95560

### Multimedia Industry and Process

6cp

*subject coordinator: tba*

This subject will examine the nature of the interactive multimedia industry today. It explores industry structure and trends, government policies in relation to the industry, job specifications, multimedia development teams and roles, the interactive multimedia development process, costs associated with development, and significant issues such as copyright and intellectual property.

## 95561

### Multimedia Products and Technology

6cp

*subject coordinator: tba*

This subject specifically explores textual analysis of multimedia as an audiovisual product for specific audiences, interactivity and engagement, the Internet, common authoring tools such as Director, networking and related issues, and introduction to OO (Object-Oriented) design and Java.

## 95562

### Multimedia Project

24cp

*subject coordinator: tba*

Students work in teams made up of students specialising in complementary disciplines to develop a major project. For example, a team might comprise students majoring in computer science, design, education and project management. Topics such as project management and business plan development are taught using a problem-based approach alongside the project development as required.

## INTERNATIONAL STUDIES SUBJECTS

### 971111, 972111, 973111, 974111

#### Chinese Language and Culture 1

8cp; 6hpw; *prerequisite: nil*

Chinese 1 aims at developing 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 Language and Culture 2

8cp; 6hpw; *prerequisite: Chinese 1*

Chinese 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 Language and Culture 3

8cp; 6hpw; *prerequisite: Chinese 2 or HSC Chinese*

Chinese 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 3 aims at further developing students' oral communicative competence in basic social interactions. More written texts will be gradually introduced to enhance the ability of students to use Chinese characters. The basic structures and devices of the language will be reinforced. Students are expected to know about 1,200 Chinese characters by the end of this unit.

#### Chinese Language and Culture 4

8cp; 2nd semester, 6hpw; *prerequisite: Chinese 3*

Chinese 4 is the second unit for students who have completed HSC 2/3 Unit Chinese.

Chinese 4 aims at further developing 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 Language and Culture 5

*8cp; 1st semester, 6hpw; prerequisite: Chinese 4*

Chinese 5 is the third unit for students who first learnt Chinese at school in Australia and obtained HSC-level Chinese.

Chinese 5 aims at further developing students' communicative competence in general social interactions. While reinforcing the macro-skills of reading, writing, listening and speaking, this unit will focus on practical writing skills. Students are expected to know about 2,000 Chinese characters by the end of this unit.

### Chinese Language and Culture 6

*8cp; 6hpw; prerequisite: Chinese 5*

Chinese 6 is the fourth subject for students who have obtained HSC 2/3 Unit Chinese. It provides students with basic communicative skills and the ability to undertake In-country Study in China.

Chinese 6 aims at further developing students' communicative competence in general social interactions. While reinforcing basic structures and devices of the language, this unit will further develop students' writing skills. Students are expected to know about 2,500 Chinese characters by the end of this unit.

### Chinese Language and Culture 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 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 at developing 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 Language and Culture 8

*8cp; 4hpw; prerequisite: Chinese 7 or equivalent*

This unit aims at developing a communicative competence at a more sophisticated level. Students are exposed to a range of Chinese texts in varied socio-cultural contexts to master

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 Language and Culture 9

*8cp; 4hpw; prerequisite: Chinese 8 or equivalent*

This unit aims at developing 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 to master Chinese for different purposes, and are provided with opportunities to maintain speaking and listening skills through discussion of the texts.

### Chinese Language and Culture 10

*8cp; 4hpw; prerequisite: Chinese 9 or equivalent*

This unit aims at further developing in students a high level of communicative competence in reading and writing to meet students' needs in social and professional interactions where Modern Standard Chinese (also known as Mandarin, Putonghua or Guoyu) is used. Students are exposed to a range of diverse texts of modern Chinese literature, history, language and culture to master written Chinese for different purposes, and are provided with further opportunities to maintain speaking and listening skills through discussion of the texts.

## 971121, 972121, 973121, 974121

### Cantonese Language and Culture A-1

*8cp; 1st semester, 6hpw; prerequisite: nil*

Cantonese A-1 is the first subject in the Cantonese A program. It is designed to provide students who have no prior knowledge of Cantonese with basic survival skills in language and culture, and the ability to undertake In-country Study in South China.

This subject aims at developing in students a survival communicative ability in basic social interactions. It also deals with the basic language structures and devices of Cantonese. Students will be taught the basic structures of Chinese writing and are expected to know about 150 Chinese characters by the end of the subject.

## 150 Subject descriptions

Cantonese A-1 consists of 78 hours of classroom instruction, involving many interactive group and pair-work activities. Audiovisual equipment and computers will be used to facilitate teaching and learning. A communicative approach is adopted for classroom instruction and students are expected to participate actively in all classroom activities in the process of acquiring language skills. The teaching incorporates an introduction to Cantonese culture and helps students to appreciate the wider cultural ramifications of Cantonese in various contexts.

### **Cantonese Language and Culture A-2**

*8cp; 2nd semester, 6hpw; prerequisite:  
Cantonese A-1*

Cantonese A-2 is the second subject in the Cantonese A program. It is designed to provide students who have no prior knowledge of Cantonese with basic survival skills in language and culture, and the ability to undertake In-country Study in South China.

This subject aims at developing in students a communicative and linguistic competence in basic social interactions. It also deals with some of the basic structures and devices of Cantonese. Students will be taught the basic structures of Chinese writing and are expected to know about 300 Chinese characters by the end of the subject.

Cantonese A-2 consists of 78 hours of classroom instruction, involving many interactive group and pair-work activities. Audiovisual equipment and computers will be used to facilitate teaching and learning. A communicative approach is adopted for classroom instruction and students are expected to participate actively in all classroom activities in the process of acquiring language skills. The teaching incorporates an introduction to Cantonese culture and helps students to appreciate the wider cultural ramifications of Cantonese in various contexts.

### **Cantonese Language and Culture A-3**

*8cp; 1st semester, 6hpw; prerequisite:  
Cantonese A-2*

Cantonese A-3 is the third subject in the Cantonese A program. It is designed to provide students who have no prior knowledge of Cantonese with basic survival skills in language and culture, and the ability to undertake In-country Study in South China.

This subject aims at developing in students a communicative and linguistic competence in general social interactions. It also deals with

the language structures and devices of Cantonese. Discourse features such as registers and polite forms will be discussed. More Cantonese vocabulary and idiomatic expressions will be introduced. Students are expected to know about 500 Chinese characters by the end of the subject.

Cantonese A-3 consists of 78 hours of classroom instruction, involving many interactive group and pair-work activities. Audiovisual equipment and computers will be used to facilitate teaching and learning. A communicative approach is adopted for classroom instruction and students are expected to participate actively in all classroom activities in the process of acquiring language skills. The teaching incorporates an introduction to Cantonese culture and helps students to appreciate the wider cultural ramifications of Cantonese in various contexts.

### **Cantonese Language and Culture A-4**

*8cp; 2nd semester, 6hpw; prerequisite:  
Cantonese A-3*

Cantonese A-4 is the last subject in the Cantonese A program. It is designed to provide students who have no prior knowledge of Cantonese with basic survival skills in language and culture, and the ability to undertake In-country Study in South China.

This subject aims at developing in students a communicative and linguistic competence in general social interactions. It deals with the more complex language structures and devices of Cantonese. A number of Cantonese discourse features will be discussed. More Cantonese vocabulary and idiomatic expressions will be introduced. Students are expected to know about 800 Chinese characters by the end of the subject.

Cantonese A-4 consists of 78 hours of classroom instruction, involving many interactive group and pair-work activities. Audiovisual equipment and computers will be used to facilitate teaching and learning. A communicative approach is adopted for classroom instruction and students are expected to participate actively in all classroom activities in the process of acquiring language skills. The teaching incorporates an introduction to Cantonese culture and helps students to appreciate the wider cultural ramifications of Cantonese in various contexts.

**Cantonese Language and Culture B-1**

*8cp; 1st semester, 4hpw; prerequisite: a working knowledge of one of the Chinese languages*

Cantonese B-1 is the first of a two-subject language program for students who have a working knowledge of at least one Chinese language to prepare them for a year of In-country Study in South China.

This subject aims at developing the students' communicative and linguistic competence in general social interactions where Cantonese is used. The Yale romanisation for transcribing Cantonese and pronunciation will be discussed in class. Situational Cantonese usages in different contexts are the main focus of class instruction. The teaching incorporates an introduction to Cantonese culture and helps students to appreciate the wider cultural ramifications of Cantonese in various contexts.

Cantonese B-1 consists of 52 contact hours of classroom instruction, involving many interactive group and pair-work activities. Audiovisual equipment and computers will be used to facilitate teaching and learning. The teaching approach adopted is 'communicative' and students are expected to participate actively in all classroom activities in the process of acquiring language skills.

**Cantonese Language and Culture B-2**

*8cp; 2nd semester, 4hpw; prerequisite: Cantonese B-1*

Cantonese B-2 is the second of a two-subject language program for students who have a working knowledge of at least one Chinese language to prepare them for a year of In-country Study in South China.

This subject aims at further developing the students' communicative and linguistic competence in general social interactions where Cantonese is used. Situational Cantonese usages and vocabulary in different contexts are the main focus of class instruction. Discourse features of Cantonese will also be discussed. The teaching incorporates an introduction to Cantonese culture and helps students to appreciate the wider cultural ramifications of Cantonese in various contexts.

This subject consists of 52 contact hours of classroom instruction, involving many interactive group and pair-work activities. Audiovisual equipment and computers will be used to facilitate teaching and learning. The teaching approach adopted is 'communicative'

and students are expected to participate actively in all classroom activities in the process of acquiring language skills.

**971211, 972211, 973211, 974211****Japanese Language and Culture 1**

*8cp; 1st semester, 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 with no prior knowledge of Japanese with the basic survival language skills and socio-cultural 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. Socio-cultural 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 Language and Culture 2**

*8cp; 2nd semester, 6hpw; prerequisite: Japanese 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 subject, students should be able to demonstrate the language and socio-cultural 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 will also further develop their reading and writing skills. Besides kana they will know approximately 150 kanji by the end of the unit. Socio-cultural aspects are introduced 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 Language and Culture 3**

*8cp; 1st semester, 6hpw; prerequisite: Japanese 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 first in a series of four units for students who have successfully completed HSC-level Japanese. By the end of the subject, students are expected to have achieved survival proficiency, 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 in order to be able to communicate in everyday situations, and be able to demonstrate an awareness of the social implications of language and behaviour.

It is expected that students will know approximately 250 kanji by the end of the unit.

#### **Japanese Language and Culture 4**

*8cp; 2nd semester, 6hpw; prerequisite:*

*Japanese 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 the 2-Unit HSC course or its equivalent and aims to further develop Japanese listening, speaking, reading and writing skills. By the end of the subject, 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 Language and Culture 5**

*8cp; 1st semester, 6hpw; prerequisite:*

*Japanese 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 4 or its equivalent and aim to further develop listening, speaking, reading, writing and cultural skills. By the end of the subject, 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 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 Language and Culture 6**

*8cp; 2nd semester, 6hpw; prerequisite:*

*Japanese 5*

Japanese 6 is the final subject in a series of four units in the post-HSC series and is for those who have successfully completed either Japanese 5 or its equivalent. By the end of this subject, students are expected to have achieved minimum 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 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 590 kanji.

### **971311, 972311, 973311, 974311**

#### **Indonesian Language and Culture 1**

*8cp; 1st semester, 6hpw; prerequisite: nil*

Indonesian 1 is the first in a series of four units for students with no prior knowledge of Indonesian. By the end of the subject, students are expected to have achieved elementary proficiency and be able to satisfy immediate needs using learnt utterances and phrases relating to the following 10 themes: self and family; direction and location; time; food and drink; buying and selling; description; archipelago and continent; travel and transport; media and the press; and love and sex.

Students are expected to develop a vocabulary of about 800–1,000 words, a knowledge of basic word-order patterns, and a familiarity with the alphabet and pronunciation patterns. This subject prepares people to exchange basic personal information using spelling and numeracy skills for names, addresses and time references etc.; engage in brief conversations within the range of themes covered; and express immediate needs with socially appropriate phrases. Students should be able to understand a limited amount of everyday written language e.g. on signs and in menus.

#### **Indonesian Language and Culture 2**

*8cp; 2nd semester, 6hpw; prerequisite:*

*Indonesian 1*

Indonesian 2 is the second in a series of four units for students with no prior knowledge of Indonesian. By the end of the subject, students are expected to have achieved minimum survival proficiency, and be able to satisfy basic survival needs and minimum courtesy requirements relating to the following 10 themes: health; house and home; contacts and appointments; education and study; career and occupations; city and village; religion and beliefs; personalities and biography; letters; and Australia–Indonesia relations.

Students are expected to develop a vocabulary of about 1,600–2,000 words, a knowledge of common word-order patterns and the ability to recognise common affixational patterns.

This subject prepares students to make simple appointments and arrangements with people, exchange personal background information, engage in five- to 10-minute conversations on the themes covered, and express feelings, likes and dislikes. Students should be able to understand short, practical pieces of written information, such as familiar signs, commands and timetables, and develop skills for reading longer, less familiar written forms.

### **Indonesian Language and Culture 3**

*8cp; 1st semester, 6hpw; prerequisite: Indonesian 2 or HSC Indonesian*

Indonesian 3 is the third in a series of four units for students with no prior knowledge of Indonesian, or first in a series of four units for students who have successfully completed HSC-level Indonesian. By the end of the subject, students are expected to have achieved survival proficiency, and be able to satisfy survival needs and limited social demands relating to the following themes: personal relations; education – young generation; students; politics; ‘pop’ culture; religion and beliefs; tourism and its influences; trade; and economics and business.

Students are expected to develop a vocabulary of about 3,000 words by the end of the subject, a knowledge of common word-order patterns, and the ability to recognise, predict and use common affixational patterns. This subject prepares students to engage in short conversations on familiar issues without undue hesitation and with an ability to express their opinion. Students should also be able to comprehend simple texts, such as messages, instructions and directions, and write simple formulaic letters.

### **Indonesian Language and Culture 4**

*8cp; 2nd semester, 6hpw; prerequisite: Indonesian 3*

Indonesian 4 is the fourth in a series of four units for students with no prior knowledge of Indonesian, or second in a series of four units for students who have successfully completed HSC-level Indonesian. By the end of the subject, students are expected to have begun to develop minimum social proficiency, and be able to satisfy limited routine social and work demands. The subject covers the following themes: the role of women; employment/labour; employers; mainstream/marginal cultures; literature; unity and diversity (multiculturalism); the environment; and Australia–Indonesia relations.

Students are expected to have developed a vocabulary of about 4,000 words by the end of the subject. They should also have developed an ability to recognise, predict and use common word-order and affixational patterns, and to participate in a limited range of social situations with appropriate language. This subject prepares students to be able to discuss familiar events and topics, and give opinions without undue hesitation and with the ability to justify themselves. Students should also be able to deal with short texts and correspond with Indonesians on familiar topics.

### **Indonesian Language and Culture 5**

*8cp; 1st semester, 6hpw; prerequisite: Indonesian 4*

Indonesian 5 is the third in a series of four units for students who have successfully completed HSC-level Indonesian. By the end of the subject, students are expected to have developed minimum social proficiency, and be able to satisfy routine social and limited work demands. The subject covers the following themes: perceptions of the past; the origin of the New Order; aspirations; achievements; problems; political culture and participation; class and social stratification; and gender.

Students completing the subject should have a vocabulary of about 5,000 words. They should have the ability to recognise and reflect on ways in which vocabulary and grammatical patterns vary in different situational contexts, and how choices in grammar and vocabulary can convey the point of view of the writer and speaker beyond the basic transmission of information. This subject prepares students to discuss a range of social topics and a limited range of work topics, and present rudimentary arguments or points of view expressed with socially appropriate phrases to limit possible misunderstanding or offence. Students should also be able to understand the general thread of articles and documents on familiar topics, and write short texts, such as letters and instructions.

### **Indonesian Language and Culture 6**

*8cp; 2nd semester, 6hpw; prerequisite: Indonesian 5*

Indonesian 6 is the fourth in a series of four units for students who have successfully completed HSC-level Indonesian. By the end of the subject, students are expected to have begun to develop minimum vocational language proficiency, and be able to satisfy all routine social and a significant range of work demands. The subject

covers the following themes: social and cultural pluralism; national and economic development; science; technical and scientific development; religion and popular culture; and internationalisation.

Students should have a vocabulary of about 6,000 words by the end of the subject. They should also have the ability to vary their language appropriately in accordance with a range of social and work situations, and be able to recognise and manipulate vocabulary and grammatical patterns. This subject prepares students to be able to present arguments or points of view, with the ability to frame them in a style that is appropriate to the social, cultural and interpersonal factors present. Students should also be able to understand articles and documents on familiar topics, and write short texts, such as letters, descriptions and simple explanations.

### **971320, 972320, 973320, 974320**

#### **Thai**

Thai is offered to UTS students through the language program offered jointly by the University of Sydney and Macquarie University. The program is designed to allow complete beginners in Thai to reach a survival level that will allow them to continue their studies in Thailand. If student numbers permit, classes will be available on UTS campuses.

### **971331, 972331, 973331, 974331**

#### **Malaysian Language and Culture 1**

*8cp; 1st semester, 6hpw; prerequisite: nil*

Malaysian 1 is the first in a series of four units for students with no prior knowledge of the language. By the end of the subject, students are expected to have achieved elementary proficiency and be able to satisfy immediate needs using learnt utterances and phrases relating to the following 10 themes: self and family; direction and location; time; food and drink; buying and selling; description; archipelago and continent; travel and transport; media and the press; and love and sex.

Students are expected to develop a vocabulary of about 800–1,000 words, a knowledge of basic word-order patterns, and familiarity with the alphabet and pronunciation patterns. This subject prepares people to exchange basic personal information using spelling and numeracy skills for names, addresses and time references, to engage in brief conversations within the range of themes covered, and to

express immediate needs with socially appropriate phrases. Students should be able to understand a limited range of everyday written language, such as signs and items and prices on menus.

#### **Malaysian Language and Culture 2**

*8cp; 2nd semester, 6hpw; prerequisite: Malaysian 1*

Malaysian 2 is the second in a series of four units for students with no prior knowledge of Malaysian. By the end of the subject, students are expected to have achieved minimum survival proficiency, and be able to satisfy basic survival needs and minimum courtesy requirements relating to the following 10 themes: health; house and home; contacts and appointments; education and study; career and occupations; city and village; religion and beliefs; personalities and biography; letters; and Australia–Malaysia relations.

Students are expected to develop a vocabulary of about 1,600–2,000 words, a knowledge of common word-order patterns and the ability to recognise common affixational patterns. This subject prepares students to make simple appointments and arrangements with people, exchange personal background information, engage in five- to 10-minute conversations on the themes covered, and express limited feelings, likes and dislikes. Students should be able to understand short practical written information, such as familiar signs, commands and timetables, and develop skills for reading longer, less familiar written forms.

#### **Malaysian Language and Culture 3**

*8cp; 1st semester, 6hpw; prerequisite: Malaysian 2*

Malaysian 3 is the third in a series of four units for students with no prior knowledge of Malaysian, or first in a series of four for students who have prior knowledge of or experience with Malaysian. By the end of the subject, students are expected to have achieved survival proficiency and be able to satisfy survival needs and limited social demands relating to the following themes: personal relations; education – young generation; students; politics; ‘pop’ culture; religion and beliefs; tourism and its influences; trade; economics; and business.

Students are expected to develop a vocabulary of about 3,000 words by the end of the subject, a knowledge of common word-order patterns, and the ability to recognise, predict and use

common affixational patterns. This subject prepares students to engage in short conversations on familiar issues without undue hesitation and with a limited ability to express opinions. Students should also be able to comprehend simple texts, such as messages, instructions and directions, and write simple formulaic letters.

#### **Malaysian Language and Culture 4**

*8cp; 2nd semester, 6hpw; prerequisite: Malaysian 3*

Malaysian 4 is the fourth in a series of four units for students with no prior knowledge of Malaysian, or second in a series of four units for students who have prior knowledge of or experience with Malaysian. By the end of the subject, students are expected to have begun to develop 'minimum social proficiency' and be able to satisfy limited routine social and work demands demonstrating the following themes: the role of women; employment/labour; employers; mainstream/marginal cultures; literature; unity and diversity (multi-culturalism); the environment; and Australia–Malaysia relations.

Students are expected to have developed a vocabulary of about 4,000 words and an ability to recognise, predict and use common word-order and affixational patterns, and recognise and respond to a limited range of social situations. This subject prepares students to discuss familiar events and topics and give opinions without undue hesitation and with a limited ability to justify these opinions. Students should also be able to deal with short texts and correspond with Malaysians on familiar topics.

#### **Malaysian Language and Culture 5**

*8cp; 1st semester, 6hpw; prerequisite: Malaysian 4*

Malaysian 5 is the third in a series of four units for students who have had prior experience with Malaysian. By the end of the subject, students are expected to have developed minimum social proficiency and be able to satisfy routine social and limited work demands. The subject covers the following themes: perceptions of the past; aspirations, achievements; problems; political culture and participation; class and social stratification; and gender.

Students completing the subject should have a vocabulary of about 5,000 words, and the ability to recognise and reflect on ways in

which vocabulary and grammatical patterns vary according to situation, and how choices in grammar and vocabulary can convey the point of view of the reader and speaker beyond the basic transmission of information. This subject prepares students to discuss a range of social topics and limited range of work topics and present rudimentary arguments or points of view expressed with socially appropriate phrases to limit possible misunderstanding or offence. Students should also be able to understand the general thread of articles and documents on familiar topics and write short texts, such as letters and instructions.

#### **Malaysian Language and Culture 6**

*8cp; 2nd semester, 6hpw; prerequisite: Malaysian 5*

Malaysian 6 is the fourth in a series of four units for students who have had prior experience with Malaysian. By the end of the subject, students are expected to have begun to develop minimum vocational proficiency, and be able to satisfy all routine social and a significant range of work demands relating to the following themes: social and cultural pluralism; national and economic development; science; technical and scientific development; religion and popular culture; and internationalisation.

Students should have a vocabulary of about 6,000 words by the end of the subject. They should also have the ability to vary their language appropriately in accordance with a limited range of social and work situations, be able to recognise and manipulate a choice of vocabulary and grammatical patterns at a limited level, and convey certain points of view. This subject prepares students to discuss a range of social topics and limited range of work topics, to present arguments or points of view, and to frame these in a style appropriate to the social, cultural and interpersonal factors present. Students should also be able to understand articles and documents on familiar topics and write short texts, such as letters, descriptions and simple explanations.

**971414/5, 972414/5, 973414/5,  
974414/5**

#### **French Language and Culture**

The French language programs offered through the Institute for International Studies are those taught at the University of Sydney and Macquarie University. Both universities teach the language at various levels, accommodating different levels of proficiency. The

French subjects develop communicative skills in listening, speaking, reading and writing, and introduce students to literary texts. Students also learn about French culture and contemporary society.

**971424/5, 972424/5, 973424/5,  
974424/5**

#### **German Language and Culture**

The German language programs offered through the Institute for International Studies are those taught at the University of Sydney and Macquarie University. Both universities teach the language at various levels, accommodating different levels of proficiency. The German subjects develop communicative skills in listening, speaking, reading and writing, and introduce students to literary texts. Students also learn about German culture and contemporary society.

**971434/5, 972434/5, 973434/5,  
974434/5**

#### **Italian Language and Culture**

The Italian language programs offered through the Institute for International Studies are those taught at the University of Sydney and Macquarie University. Both universities teach the language at various levels, accommodating different levels of proficiency. The Italian subjects develop communicative skills in listening, speaking, reading and writing, and introduce students to literary texts. Students also learn about Italian culture and contemporary society.

**971501, 972501, 973501, 974501**

#### **Spanish Language and Culture 1**

*8cp; 1st semester, 6hpw; prerequisite: nil*

Spanish 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 language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the subject, students would be expected to have achieved 'elementary proficiency' and be able to satisfy immediate communication needs using expressions and phrases they have learnt that are required in basic social interaction. The program allows for the development of listening, speaking, reading and writing skills, and an understanding of the socio-cultural 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 of expressing new meanings.

Spanish 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 will be used to facilitate learning.

#### **Spanish Language and Culture 2**

*8cp; 2nd semester, 6hpw; prerequisite: Spanish 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 language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the subject, students would be 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 will also develop an understanding of the socio-cultural contexts in which the language is used and further communication strategies.

Spanish 2 consists of 78 hours of classroom instruction. The approach adopted is 'communicative' and provides many opportunities for the students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers will be used to facilitate learning.

#### **Spanish Language and Culture 3**

*8cp; 1st semester, 6hpw; prerequisite: Spanish 2 or HSC Spanish*

Spanish 3 is the third in a series of four units for students with no prior knowledge of the Spanish language, or 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 language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the subject, students would be expected to have achieved a communicative competence in speaking, listening, reading and writing in order to be able to satisfy all 'survival' needs and limited social needs. They would also be expected to have developed an awareness of the various social and cultural

contexts in which the language is used. In this subject, students develop the ability to understand the general content of magazine and newspaper articles.

Spanish 3 consists of 78 hours of classroom instruction. The approach adopted is 'communicative' and provides many opportunities for the students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers will be used to facilitate learning.

#### **Spanish Language and Culture 4**

*8cp; 2nd semester, 6hpw; prerequisite: Spanish 3*

Spanish 4 is the fourth in a series of four units for students with no prior knowledge of the Spanish language, or second in a series of four units for students who have successfully completed Spanish 3 and HSC-level Spanish or its equivalent. It provides students with basic survival skills in language and culture, and the ability to undertake In-country Study in Latin America or Spain.

By the end of the subject, students would be expected to have begun to develop the communication skills required to satisfy limited routine social and work demands. They would also be 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 to find accommodation.

Spanish 4 consists of 78 hours of classroom instruction. The approach adopted is 'communicative' and provides many opportunities for the students to interact and use the language in various social and cultural contexts. Audiovisual equipment and computers will be used to facilitate learning.

#### **Spanish Language and Culture 5**

*8cp; 1st semester, 6hpw; prerequisite: Spanish 4*

Spanish 5 is the third in a series of four units designed to provide students who have successfully completed Spanish 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 subject, students would be expected to have achieved the communicative competence in speaking, listening, reading and writing 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 practice interview techniques in preparation for In-country Study.

Spanish 5 consists of 78 hours of classroom instruction. The approach adopted is 'communicative' and provides many opportunities for the 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 will be used to facilitate learning.

#### **Spanish Language and Culture 6**

*8cp; 2nd semester, 6hpw; prerequisite: Spanish 5*

Spanish 6 is the fourth in a series of four units designed to provide students who have successfully completed Spanish 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 subject, students would be expected to be able to speak the language with sufficient accuracy to participate in limited formal and informal conversations on practical and social topics. Students would also be 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 6 consists of 78 hours of classroom instruction. The approach adopted is 'communicative' and provides many opportunities for the 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 will be used to facilitate learning.

### **971710, 972710, 973710, 974710**

#### **Greek**

Greek is offered to UTS students through arrangements with other universities in Sydney. 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 literature, society and culture.

**971734, 972734, 973734, 974734****Russian**

Russian is offered to UTS students through an arrangement with Macquarie University. 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 facility.

**976101****Chinese East Asia**

*8cp; 2nd semester, 4hpw*

South China – Hong Kong, Taiwan and the Southern Chinese provinces of Fujian and Guangdong – is a region of global importance. It is a dynamo of economic growth for the East Asia region that has grown out of the economic integration of Hong Kong, Taiwan and South China, and is now expanding to include East China. Yet its constituent parts have developed separately in different and often inimical political systems. As a result of all these factors, South China is likely to be of increasing importance strategically, economically and politically. This subject examines the development of Hong Kong, Taiwan and South China and their interaction. It is an introductory subject that requires no prior knowledge of the region or of any Chinese language.

**976111****Contemporary China**

*8cp; 2nd semester, 4hpw*

This subject examines the contours and dynamics of social, political and economic change in the People's Republic of China since the death of Mao Zedong and the start of the reform era. A central theme is the emerging relationship between state and society in a state socialist system in the process of change and reform. It is an introductory subject that requires no prior knowledge of the People's Republic of China or of any Chinese language.

**976211****Contemporary Japan**

*8cp; 2nd semester, 4hpw*

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 Japanese culture. This subject requires no prior knowledge of Japan or of Japanese.

**976301****Contemporary South-East Asia**

*8cp; 2nd semester, 4hpw*

This subject provides an introduction to the countries of Indonesia, Malaysia and Thailand. The themes of modernity and identity will be examined at a political-economic level and also at the individual level. Issues which will be 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 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; 2nd semester, 5hpw*

This unit is an introduction and an overview laying the groundwork for the study of contemporary Europe. It surveys present-day European Union institutions and sociopolitical developments, and provides a comparative study of political and social developments in the countries of Western and Eastern Europe. It aims to provide students with an understanding of the historical background of the present-day Europe and enable them to identify major contemporary policy issues in this region of the world.

**976501****Contemporary Latin America***8cp; 2nd semester, 4hpw*

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 has shifted towards economic growth, internationalisation, and pressures to improve the capacity and accountability of governments. The unit aims to prepare 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 Spanish.

**977xxx****In-country Study 1***24cp; prerequisite: completion of 4 semesters of study in the International Studies program*

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. This is determined by the student's International Studies major.

The following majors are available in the International Studies program: Argentina, Australia and the Asia-Pacific Region, Chile, China, France, Germany, Greece, Indonesia, Italy, Japan, Malaysia, Mexico, Russia, South China, Spain, Taiwan, Thailand and Vietnam.

**978xxx****In-country Study 2***24cp; prerequisites: 977xxx In-country Study 1; completion of 4 semesters of study in the International Studies program*

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. This is determined by the student's International Studies major.

The following majors are available in the International Studies program: Argentina, Australia and the Asia-Pacific Region, Chile, China, France, Germany, Greece, Indonesia, Italy, Japan, Malaysia, Mexico, Russia, South China, Spain, Taiwan, Thailand and Vietnam.

# BOARDS AND COMMITTEES

---

## FACULTY BOARD IN MATHEMATICAL AND COMPUTING SCIENCES

### Ex officio members

*Dean of Faculty*

Professor M Fry (Chair)

*Head, School of Mathematical Sciences*

Associate Professor G J McLelland (Deputy Chair)

*Head, School of Computing Sciences*

Associate Professor J J Edwards

*The Professoriate*

Professor L C Botten, School of Mathematical Sciences

Professor J K Debenham, School of Computing Sciences

Professor L Harvey, School of Computing Sciences

Professor I T Hawryszkiewicz, School of Computing Sciences

Professor B Hendersen-Sellers, School of Computing Sciences

Professor J M Hughes, School of Computing Sciences

Professor E Platen, School of Mathematical Sciences

*Faculty Business Manager*

Mr G Goodwin-Moore

*Faculty Operations Manager*

Ms L G McCoy

### Nominated members

Dr G Caprarelli, Faculty of Science

Professor A Hall, Faculty of Business

Dr A Mack, Faculty of Engineering

Ms A Reid, Centre for Learning and Teaching

Dr Y Wang, Institute for International Studies

### Elected staff members

#### *School of Mathematical Sciences*

*Academic staff*

Associate Professor G L Cohen

Ms L Groen

Mr T N Langtry

Dr G H Smith

Associate Professor D J Street

Ms L N Wood

Mr P A Wright

#### *School of Computing Sciences*

*Academic staff*

Mr P Bebbington

Mr J Colville

Dr B Howarth

Mr C S Johnson

Mr C W Johnson

Ms E Lawrence

Dr T Osborn

#### *Faculty of Mathematical and Computing Sciences*

*Support staff*

Ms I Chu

Mr D Saunders

### Elected student members

#### *School of Mathematical Sciences*

Mr D Goh

Mr J Moon

#### *School of Computing Sciences*

Mr A Air

Mr J Steadson

### Official observer

Mr A Mowbray, Faculty of Law

## FACULTY GRADUATE STUDIES COMMITTEE

### Ex officio members

*Dean of the Faculty*

Professor M Fry

*Head, School of Mathematical Sciences*

Associate Professor G J McLelland

*Head, School of Computing Sciences*

Associate Professor J J Edwards

*Director, Postgraduate Studies, School of Mathematical Sciences*

Associate Professor G L Cohen

*Director, Postgraduate Studies, School of Computing Sciences*

Professor J K Debenham

*Faculty Operations Manager*

Ms L G McCoy

**Nominated members**

*School of Mathematical Sciences*  
Dr Y Zinder

*School of Computing Sciences*  
Dr K G Suffern

**MATHEMATICAL SCIENCES  
ADVISORY COMMITTEE**

**Ex officio members**

*Dean of Faculty*  
Professor M Fry

*Head, School of Mathematical Sciences*  
Associate Professor G J McLelland

**Academic staff member**

Associate Professor G L Cohen

**External members**

Dr L Balzer, Investment Manager, Lend  
Lease Investment Management  
Dr J Green (Chair), Executive Director,  
Quantitative Applications Division,  
Macquarie Bank  
Mr L Jones, Manager, Airport Planning,  
Qantas Airways Ltd  
Ms J Kelly, Executive Director, Government  
and Social, AC Nielsen Research  
Dr G Lack, Director, Management  
Consultancy Division, Coopers & Lybrand  
Consultants  
Ms E Matiuk, Analyst, Bankers Trust  
Australia  
Mr R Tse, Portfolio Risk Manager, MGICA

**Recent graduates**

Mrs D Nash, Commonwealth Bank of  
Australia  
Mr L Rask, CS First Boston Australia  
Mr N Rugg, Australian Stock Exchange

**COMPUTING SCIENCES  
ADVISORY COMMITTEE**

**Ex officio members**

*Dean of Faculty*  
Professor M Fry

*Head, School of Computing Sciences*  
Associate Professor J J Edwards

**Academic staff member**

Dr B Howarth

**External members**

Mr F Balboni (Chair), Partner,  
PricewaterhouseCoopers  
Mr M Boland, Consulting Systems Engineer,  
CISCO Systems Australia Pty Ltd  
Mr R Bridge, National Director of Marketing,  
Australian Computer Society  
Mr R Chaplin, Banking and Financial  
Systems, EDS (Australia) Pty Limited  
Mr C Connaughton, AD/M Technical  
Solution Manager, IBM Global Services  
Australia Limited  
Mr P Fuller, Executive Manager, IT  
Corporate Systems, St George Bank Limited  
Mr Michael McDonald, Managing Director,  
Atmosfera  
Ms K Payten, Development Manager, Funds  
Management, IBM Global Services Australia  
Limited  
Dr R Sandland, Chief, Mathematical and  
Information Sciences Division, CSIRO  
Ms B Webb, CSC Australia

## **COURSE ADVISORY COMMITTEE**

### **Bachelor of Information Technology – Course Steering Committee**

*Dean of Faculty*  
Professor M Fry

*Head, School of Computing Sciences*  
Associate Professor J J Edwards

*Director, Undergraduate Studies*  
Dr B Howarth

*BInfTech Coordinator*  
Mr J Underwood

*Director, Industry Liaison*  
Ms A Watkins

#### **External members**

Ms C Andrews, Westpac Banking Corporation

Ms J Armstrong, PricewaterhouseCoopers

Mr W Astill, IBM Australia Limited

Mr F Balboni, PricewaterhouseCoopers

Mr R Carroll, Amdahl Pacific Services Pty Ltd

Ms M Carruthers, Andersen Consulting

Ms A Cleaver, Qantas Information Technology Limited

Mr D Close, Fujitsu Australia Limited

Mr K Crowe, Westpac Banking Corporation

Mr K Deacon, IBM Global Services Australia Limited

Mr G Duvall, Australian Water Technologies

Ms L Edwards, Bankers Trust Australia Limited

Mr A Erratt, Wang Global

Mr P Fuller, St George Bank Limited

Mr T Gruzin, Andersen Consulting

Ms D Haines, PricewaterhouseCoopers

Mr R Harris, EDS (Services) Pty Limited

Mr B Judd, Ticketek Pty Ltd

Ms E Korwin, Australian Broadcasting Corporation

Mr K Leung, TIBCO

Mr A Lihou, Woolworths Limited

Mr J Loebenstein, St George Bank Limited

Ms C Long, IBM Australia Limited

Mr B Luke, Westpac Financial Services

Mr A Luxford, CSC Australia

Ms A Maddigan, Oracle Corporation

Mr D Mason, Wang Global

Ms L Mathew, IBM Global Services Australia Limited

Ms L McLoughlin, TIBCO Finance Technology Inc

Ms L Moore, IBM Global Services Australia Limited

Mr K Newman, Reserve Bank of Australia

Mr P Noble, Fujitsu Australia Limited

Ms E O'Leary, Andersen Consulting

Mr B Reeves, Arthur Andersen

Mr J Roberts, PricewaterhouseCoopers

Ms L Roseby, Wang Global

Mr J Short, Qantas Information Technology Limited

Mr K Smart, Macquarie Bank Limited

Ms N Smith, Bankers Trust Australia Limited

Mr G Stalley, Arthur Andersen

Mr D Steinbeck, Cisco Systems Australia

Mr N Stewart, PricewaterhouseCoopers

Mrs F Sutherland, Colonial

Mr D Sweeney, American Express International Inc.

Ms A Taylor, Woolworths Limited

Mr A Williams, Tibco Software Ltd

Mr L Wright, EDS (Services) Pty Limited

Mr C Zammit, IBM Australia Limited

#### **Student representatives**

Ms A Hu

Mr L Ratnamohan

#### **UTS mentors**

This group consists of a number of academic staff from the School of Computing Sciences. Their principal role is to ensure that students will benefit from the industry placement. The mentors act as the primary point of contact between the student and the University, and between the sponsor and the University during the industry placement.

# STAFF LIST

---

*Professor of Computer Networks and Dean of Mathematical and Computing Sciences*  
M Fry, MA (Cantab), MSc (Lond), PhD (Syd), DIC

*Executive Assistant*  
J Oliffe

*Technical Services Manager*  
P D Gale, BScEng (Aero) (UNSW), MAHS, FWCAE

*Faculty Business Manager*  
G C Goodwin-Moore, BSc (Hons) (Lond)

*Faculty Operations Manager*  
L G McCoy, BA (UNE)

*Promotions Officer*  
J H Donovan, BA (UNSW)

## **Student Administration**

*Professional Programs Manager*  
A Stevens, BA, MAppPsych (Macq)

*Industry Liaison Officer*  
D A Saunders

*Graduate Administration Officer*  
L Abraham, BA (W'gong)

*Student Liaison Officers*  
I Chu, BA (UTS)  
J C Smith

*Liaison Officers*  
L Chamas  
W Kusuma  
E Pathmanathan

## **Technical Services**

*Systems Manager*  
S B Gowing, BSc (UTS)

*Network and Development Manager*  
G Redwood, BE (Hons) (NSWIT)

*Systems Programmers*  
B J Kuit  
G J Lingard, BSc (Hons) (UNE)

*Information Systems Developer*  
M Lynch, BA, LLB (Macq)

*Senior Technical Services Officer*  
B Power, E&C Cert (TAFE)

*Technical Officer*  
M Sharafutdinov, BSc (Tashkent University), MSc (Academy of Sciences, Moscow)

*Technical Services Officers*  
A Altman, Cert EE (Polytechnic Institute, Odessa)  
D Kensey, BComm (UWS), GradDipEd (ACU)  
W Yee, BE (UNSW)

*Technical Assistant*  
M Power

*Industrial Training Student*  
W Pranata

## **School of Mathematical Sciences**

*Associate Professor and Head of School*  
G J McLelland, BSc, PhD (Syd)

*Associate Professor, Deputy Head of School and Director, Postgraduate Studies*  
G L Cohen, MSc (Syd), PhD (UNSW), CMATH, FIMA, FAustMS

*Professor of Applied Mathematics*  
A Novikov, DSc (Steklov, Moscow)

*Professor of Mathematics*  
L C Botten, BSc (Hons), PhD (Tas), FAIP, FAustMS, MACS, MOSA

*Professor of Quantitative Finance*  
E Platen, MSc, PhD (Dresden)

*Director, Undergraduate Studies*  
G H Smith, MSc (Rand), PhD (UNSW), DipGeoscience (Macq)

*Adjunct Professor*  
R C McPhedran, BSc (Hons), PhD (Tas), FAIP, FOSA

*Honorary Associates*  
K T Atanassov, BSc (Sofia), PhD (BAS)  
L Cooks, MSc, PhD (Lvov)  
K R McCloy, BSurv (UNSW), PhD (Adel)  
R S Melham, BSc, DipEd (UNSW), MLitt (UNE), MA (Syd), PhD (UTS)  
N A Nicorovici, DipPhys, PhD (Bucharest), MOSA

## **Mathematics Unit**

*Associate Professor and Head of Unit*  
G L Cohen, MSc (Syd), PhD (UNSW), CMATH, FIMA, FAustMS

*Professor of Applied Mathematics*  
L C Botten, BSc (Hons), PhD (Tas), FAIP, FAustMS, MACS, MOSA

*Professor of Quantitative Finance*  
E Platen, MSc, PhD (Dresden)

*Associate Professor*

G J McLelland, BSc, PhD (Syd)

*Senior Lecturers*

T N Langtry, BA (Hons) (UNSW), MAppSc (NSWIT), PhD (UNSW), MACS

B J Moore, MSc (Syd), PhD (Cantab)

G H Smith, MSc (Rand), PhD (UNSW), DipGeoscience (Macq)

L N Wood, BSc (Hons) (UNSW), DipEd (Tech) (SCAE), MA (Macq)

*Lecturers*

M Coupland, BSc, DipEd, MEd (Syd)

E Schlögl, DipVw, PhD (Bonn), MBFS

**Statistics and Operations Research Unit**

*Associate Professor and Head of Unit*

D J Street, BSc (Hons) (Q'ld), PhD (Syd), FTICA

*Senior Lecturers*

P Petocz, BA (Hons), PhD (UNSW), DipEd (Tech) (SCAE)

Y Zinder, MSc (Gorky), PhD (AcadSc, USSR), MASOR

*Lecturers*

L Groen, BSc, DipEd (Syd), GradDipOR (NSWIT), MAppSc (UTS), MCom (Hons) (UNSW), MASOR

J M Hogg, BSc (Syd), MSc (OR) (UNSW), MASOR

E Lidums, BSc (Hons), MSc (Syd)

R M Sorli, BSc (Hons) (Syd), MAppSc (NSWIT), MACS

P A Wright, BA (Macq), MStats, MEngSc (UNSW)

**Administrative staff**

*Executive Assistant*

M J Roman, BEcon (NEU, Lima), MBus (UWS)

**Research staff**

*Senior Research Fellow*

D Heath, BSc (ANU), Grad Dip (Comp Studies) (UC), PhD (ANU)

**Mathematics Study Centre**

*Senior Lecturer and Director*

L N Wood, BSc (Hons) (UNSW), DipEd (Tech) (SCAE), MA (Macq)

*Lecturers*

J Harnett, BA (Hons) (Macq), DipTeach (Tas), PhD (Syd)

N F Smith, BEc (Hons) (Syd)

**School of Computing Sciences**

*Associate Professor and Head of School*

J J Edwards, BSc (Hons), MSc, PhD (Syd), MACS, MASOR

*Director of Undergraduate Studies*

B Howarth, BSc (UNSW), MEng (N'cle), PhD (UC Berkeley), SMIEEE, MACS

*Professor of Computing Science, Deputy Head of School and Director, Postgraduate Studies*

J K Debenham, MA, MSc (Dub), PhD (Syd)

*Professor of Computing Science*

I T Hawryszkiewicz, BE (Hons), ME (Adel), PhD (MIT), MACS

*Professor of Information Systems and Director, COTAR*

B Hendersen-Sellers, BSc (Hons) (Lond), MSc (Reading), PhD (Leic), ARCS, FIMA, FIEAust, MACS, CPEng

*Professor of Computing*

J M Hughes, BSc (Syd), MIEEE, FACS, MBCS

*Adjunct Professor*

L Constantine, SB (MIT)

*Associate Professors*

T B Hintz, BSc (EE) (Texas), MSc (EE), DSc (EE) (N Mexico State), MACS, MACM, MIEEE

C B Jay, BSc (Hons) (Syd), PhD (McG)

D N Wilson, BSc (Hons), MSc (UTS), CEng, MBCS, MACS, MACM, MQSA

*Honary Associates*

J Goddard, DipTech (Public Admin) (NSWIT), MSCS, FACS

D Herbison-Evans, BA (Hons), MA, DPhil (Oxon), Dip (Dance Ed) (Sydney Dance Development Centre)

W Holmes, BEE (Melb)

B Unhelkar, PhD (UTS)

*Senior Lecturers*

J Colville, MSc (Melb), MBCS, MACS, CEng

J Feuerlicht, BSc, DIC, PhD (Lond), MACS

V Gay, BCompSc (Hons) (Paris), MCompSc (Amiens), PhD (Paris), DipResearch (Paris)

B Howarth, BSc (UNSW), MEng (N'cle), PhD (UC Berkeley), SMIEEE, MACS

T Osborn, BMath (Hons), MMath, PhD (N'cle), INNS, ACM

R Rist, BSc (Psych) (Hons), BSc (ComSc) (UNSW), GradDip (CCAEE), MSc, MPhil, PhD (Yale), MACS

T Robertson, BA (Hons) (Syd), GradDipDataProc (UTS), MCogSc (UNSW), PhD (UTS)

K G Suffern, BSc (Hons), MSc (Monash), MSc (Corn), PhD (Syd), MACS  
 U Szewcow, BSc, DipNAAC (Syd), MEngSc (UNSW), MIEEE, MACS

*Lecturers*

R P Bebbington, BSc (Tech), MEngSc, MCom (UNSW), MACS  
 J Clark, BEcon (James Cook), MEcon (NMexico), IASTED, ACM, BIM  
 J El-Den, BScCompEng, MScCompEng (METU, Ankara)  
 N Hamilton, BInfTech, MInfmSys (Q'ld), LLM (UTS), Barrister of the Supreme Court of Queensland and the High Court of Australia  
 X He, BSc (Xiamen), MSc (Fuzhan), MSc (Flinders), PhD (UTS)  
 M-L Huang, BE Comp (East China), GradDipBusComp, MComp (UWS Nepean), PhD (N'cle)  
 C S Johnson, BAppSc (Hons) (CompSc) (NSWIT), MPhil (Brun)  
 C W Johnson, MAppSc (NSWIT), MComp (Macq), MRACI, CChem, MACS  
 G Keller, GradDipCompSc, PhD (T U Berlin)  
 P Kennedy, BSc (CompSc) (Hons), PhD (UTS)  
 E Lawrence, BA (Q'ld), GradDipComComp (QUT), MBIT (USQ), MACS  
 B R E Lederer, BSc (Hons), MEngSc (UNSW), PhD (Syd), MACS  
 C Liu, BSc, MSc, PhD (Nanjing)  
 S Prabhakar, BE, PhD (IISc)  
 R van der Meyden, MA (Syd), PhD (Rutgers)  
 R Raban, MEng (Warsaw)  
 K Sayer, BInf (Hons), PhD (Griff)  
 H V Tu, BSc, BE (Montreal), ME (Hons) (W'gong), MCSEE, MACS  
 J Underwood, BSc (UNSW), GradDipRecPlan, GradDipAdmin (CCAIE)  
 J Vochtelo, BSc (Hons) (UNSW)

B Wong, BSc (Syd), MCom (UNSW), CQA, MACS, AIMM, MQSA, JP

**Administrative staff**

*Executive Assistant*

K O'Toole, BSc (Hons), PhD (Syd)

*Administrative Assistant*

M Woessner

**Research staff**

*Senior Research Fellow*

A Ghosh, BSc (Eng), MSc (Lond), MACM

*Postdoctoral Research Fellow*

K Glehardt, MSc, PhD (Kiel)

*Research Assistant*

G McLarty, BSc (Hons) (UTS)

**Cooperative Research Centre for Distributed Systems Technology (DSTC)**

*Business Manager*

K H Dinh, BE (Hons) (Auck), PhD (UNSW)

*Systems Administrator*

V Witana

*Research Scientist*

M Antoniadis, BSc (UTS)

# INDEX

---

## A

Aboriginal Cultures and Philosophies 139  
 Aboriginal Forms of Discourse 146  
 Aboriginal People and the Media 145  
 Aboriginal Social and Political History 145  
 Abstudy 8  
 Accounting A 140  
 Accounting for Managerial Decisions 140  
 Accounting Information Systems 140  
 Advanced 3D Computer Animation 136  
 Advanced Algebra 117  
 Advanced Calculus 114  
 Advanced Cognitive Modelling 136  
 Advanced Corporate Finance 142  
 Advanced Data Management 132  
 Advanced Financial Modelling 119  
 Advanced Image Synthesis Techniques 136  
 Advanced Machine Learning 133  
 Advanced Mathematical Methods 118  
 Advanced Mathematical Programming 118  
 Advanced Project Management 137  
 Advanced Stochastic Processes 119  
 Advances in Information Technology 137  
 Analysis 1 115  
 Analysis 2 115  
 Analytic Number Theory 117  
 Applications 6  
 Applications Development with Delphi 131  
 Applications Development with Visual Basic 131  
 Applications of Artificial Intelligence 132  
 Applications of Information Technology 1 128  
 Applications of Information Technology 2 129  
 Applied Mathematical Programming 120  
 Applied Mathematics 3A 115  
 Applied Mathematics 3B 115  
 Applied Simulation Modelling 121  
 Art Collection, UTS 11  
 Artificial Intelligence Applications 127  
 Audiovisual Media Production 144  
 Auditing the Computer 129  
 Australian IT Industry 124  
 Austudy 8

## B

Bachelor of Computing 83  
 Bachelor of Computing/Bachelor of Arts in  
     International Studies 84  
 Bachelor of Information Technology 74  
 Bachelor of Mathematics and Computing 44  
 Bachelor of Mathematics and Finance 39  
 Bachelor of Mathematics and Finance  
     (Honours) 40  
 Bachelor of Mathematics and Finance/Bachelor of  
     Arts in International Studies 41

Bachelor of Science (Honours) in Computing  
     Science 81  
 Bachelor of Science (Honours) in Mathematics 35  
 Bachelor of Science in Computing Science 65  
 Bachelor of Science in Computing Science/  
     Bachelor of Arts in International Studies 77  
 Bachelor of Science in Computing Science/  
     Bachelor of Laws 80  
 Bachelor of Science in Mathematics 31  
 Bachelor of Science in Mathematics/Bachelor of  
     Arts in International Studies 36  
 Boards and committees 160  
 Bridging Mathematics 27  
 Bridging subjects 27  
 Building Intelligent Agents 135  
 Business Finance 141  
 Business Law 147  
 Business Process Engineering 136  
 Business Processes and IT Strategy 126  
 Business Requirements Analysis 128  
 Business Systems Design 129

## C

C for Systems Programmers 134  
 Cantonese Language and Culture 149  
 Capital Budgeting and Valuation (Honours) 142  
 Career Services 9  
 Case Studies in Management Science 121  
 Case-based Reasoning 127  
 Chemistry Learning Resources Centre 9  
 Child care 11  
 Chinese East Asia 158  
 Chinese Language and Culture 148  
 Co-op Bookshop 11  
 Cognitive Modelling 130  
 Commerce on the Internet 133  
 Commercial Programming 126  
 Commercial Programming in Cobol 130  
 Committees 160  
     Computing Sciences Advisory Committee 161  
     Course Advisory Committee 162  
     Faculty Graduate Studies Committee 160  
     Mathematical Sciences Advisory  
         Committee 161  
 Communication Technology 147  
 Comparative Social Change 143  
 Computer Fundamentals 124  
 Computer Graphics 132  
 Computer Graphics 1 147  
 Computer Graphics Rendering Techniques 125  
 Computer laboratories 10  
 Computer Systems Architecture 122  
 Computers and Audiovisual Production 145  
 Computers and Print Production 145  
 Computing facilities 26, 61

Computing Literature, The 131  
 Computing Practice 122  
 Computing Sciences, School of 59  
 Computing Theory 125  
 Conducting Business Electronically 135  
 Contacts

Faculty Office 18  
 School of Computing Sciences 64  
 School of Mathematical Sciences 30

Contemporary China 158  
 Contemporary Europe 158  
 Contemporary Information Technology 1 126  
 Contemporary Information Technology 2 128  
 Contemporary Japan 158  
 Contemporary Latin America 159  
 Contemporary Management Practices 139  
 Contemporary South-East Asia 158  
 Contemporary Telecommunications 137  
 Continuing Professional Education (CPE) 19  
 Convexity and Optimisation 118  
 Counselling 9  
 Course Advisory Committee 162  
 Courses  
 List of courses and codes 25  
 Postgraduate 46, 85  
 Undergraduate 31, 65

## D

Database Design 123  
 Databases in Distributed Environments 135  
 Dates for 2000, Principal 12  
 Dean's message 15  
 Derivative Securities 141  
 Derivative Security Pricing 142  
 Design and Analysis of Experiments 116  
 Design of Hypermedia Information Systems 143  
 Designing the Networked Enterprise 134  
 Differential Equations 114  
 Discrete Mathematics 113  
 Discrete Mathematics (S) 113  
 Discrete Optimisation 118  
 Distributed Databases and Client/Server  
 Computing 123  
 Distributed Software Programming 130, 134  
 Doctor of Philosophy 47, 86  
 Double degree in Business and Computing  
 Science 81  
 Dynamic Optimisation 118

## E

Effective People Management 139  
 Electives, International Studies 22  
 English Language Study Skills Assistance  
 (ELSSA) Centre 9  
 Enterprise Wide Software Systems 136  
 Environmental Health and Safety 24  
 Equity and Diversity 10  
 Exemptions, Subjects 28

## F

Faculty of Mathematical and Computing Sciences  
 Boards and committees 160  
 Continuing Professional Education (CPE) 19  
 Faculty Board in Mathematical and Computing  
 Sciences 160  
 Faculty Graduate Studies Committee 160  
 Faculty Mission Statement 16  
 Faculty of Mathematical and Computing Sciences  
 (cont.)  
 Faculty Office contacts 18  
 Information 15  
 Information for students 17  
 Message from the Dean 15  
 School of Computing Sciences 59  
 School of Mathematical Sciences 26  
 Staff list 163  
 Fees and costs 6  
 Financial Management 142  
 Financial Markets 141  
 Financial Modelling 117  
 Financial Time Series Analysis 141  
 Financing Decisions and Capital Market  
 Theory 141  
 Freedom of Information 11  
 French Language and Culture 155  
 Functional Analysis 117  
 Further Methods in Operations Research 120

## G

Gallery and Art Collection, UTS 11  
 German Language and Culture 156  
 Global Information Systems 135  
 Graduate Certificate in Information  
 Technology 100  
 Graduate Certificate in Information Technology  
 Management 93  
 Graduate Certificate in Interactive Multimedia 96  
 Graduate Certificate in Internetworking 98  
 Graduate Certificate in Mathematical Sciences 52  
 Graduate Diploma in Applicable Mathematics 49  
 Graduate Diploma in Information Technology 99  
 Graduate Diploma in Information Technology  
 Management 93  
 Graduate Diploma in Interactive Multimedia 96  
 Graduate Diploma in Internetworking 98  
 Graduate Diploma in Mathematics and  
 Finance 50  
 Graduate Diploma in Operations Research 50  
 Graduate Diploma in Statistics 51  
 Graduation ceremonies 24  
 Graphic Visualisation 147  
 Greek 157  
 Group Project 114

## H

Health 9  
 Health Statistics 114  
 HECS (Higher Education Contribution Scheme) 7

History of Mathematics 113  
Honours Research Project 131  
Honours Seminar 1 131  
Honours Seminar 2 131  
Honours Seminar A 120  
Honours Seminar B 120  
Housing 9  
Human Factors and Design 147  
Human-Computer Interaction 128  
Human-Computer Interaction in Information Systems 132  
Hypermedia Technologies 143

## I

Impact of Information Technology 137  
In-country Study 1 159  
In-country Study 2 159  
Indonesian Language and Culture 152  
Industrial Training (F/T) 125, 126  
Industrial Training (P/T) 126  
Industry Project 1 128  
Industry Project 2 129  
Information  
Continuing Professional Education (CPE) 19  
Faculty of Mathematical and Computing Sciences 15  
Faculty Office contacts 18  
Information Behaviour 146  
Information Processing Strategy 132  
Information Production and Presentation 146  
Information Retrieval 146  
Information Structures, Perception and User Interface Design 142  
Information Systems 122  
Information Systems and Organisation Development 126  
Information Technology Division (ITD) facilities 61  
Information Technology Planning and Design 124  
Information Technology Strategy 137  
Inquiries, Student 6  
Insearch Institute of Commerce 24  
Integrated Services Network 142  
Intelligent Agents in Java 127  
International Financial Management 141  
International Studies  
Electives 22  
Subjects 148  
Internet Commerce 127  
Internet Programming 133  
Internetwork Design 134  
Internetworking 133  
Internetworking Project (12cp) 134  
Internetworking Project (18cp) 133  
Internetworking Research 133  
Introduction to Australian IT Industry 125  
Introduction to Computer Graphics 121  
Introduction to Computers for Beginners 27  
Introduction to Computing 113  
Introduction to Computing Research 131

Introduction to Design Computing 147  
Introduction to Statistics 27  
Introductory Mathematical Methods 112  
Investment Analysis (Honours) 142  
Italian Language and Culture 156

## J

Japanese Language and Culture 151  
Jumbunna Centre for Australian Indigenous Studies, Education and Research (CAISER) 10

## K

Knowledge Management 135  
Knowledge Technology 121  
Knowledge-based Systems 127

## L

LANs and Routing 134  
Library, UTS 8  
Linear Algebra 113  
Linear Models and Experimental Design 119  
Loglinear Modelling 119

## M

Machine Learning 127  
Macroeconomics 141  
Malaysian Language and Culture 154  
Management Research Methods 139  
Managerial Accounting 140  
Managerial Analysis and Evaluation of Information 137  
Managing Client Relations 140  
Managing Organisational Change 139  
Marketing Principles 140  
Master of Business in Information Technology Management 93  
Master of Interactive Multimedia 96  
Master of Science 47, 87  
Master of Science in Computing 88  
Master of Science in Internetworking 98  
Master of Science in Operations Research 48  
Mathematica 28  
Mathematical Methods 115  
Mathematical Practice 112  
Mathematical Sciences, School of 26  
Mathematics 1 112  
Mathematics 2 112  
Mathematics in Sport 112  
Mathematics Preparation for Nursing 28  
Mathematics Study (1, 2, 3) 27  
Mathematics Study Centre 10, 26  
Mathematics Tutorial (1, 2, 3) 27  
Mathematics Workshop (1, 2, 3, 4, 5, 6) 27  
Media, Culture and Society 144  
Media Studies 143  
Microeconomic Theory and Policy 141  
Microeconomics 141  
Mono Media Technologies 143  
Multi-Agent Systems 136

Multimedia Industry and Process 148  
 Multimedia Products and Technology 148  
 Multimedia Project 148  
 Multivariate Statistics 119

## N

NetDesign 145  
 Network Management 134  
 Network Modelling 120  
 Network Optimisation 116  
 Networked Enterprise Design 131  
 Networking 1 124  
 Networking 2 124  
 Networking Communities 135  
 Nonlinear Dynamical Systems 118  
 Nonlinear Statistical Models 119  
 Numerical Analysis 1 114  
 Numerical Analysis 2 116

## O

Object-oriented Methodologies 130  
 Object-oriented Programming and C++ 129  
 Object-oriented Software Development 132  
 Objectbases 130  
 Operating Systems 124, 132  
 Operating Systems Facilities 129  
 Operating Systems for Internetworking 134  
 Operations Research Modelling 113  
 Operations Research Practice 115  
 Optimal Control 1 120  
 Optimal Control 2 120  
 Optimisation 1 114  
 Optimisation 2 116  
 Organisation of Information 146

## P

Partial Differential Equations 118  
 Performance Modelling 130  
 Photography for Designers 148  
 Physics Learning Centre 10  
 Politics of Aboriginal History, The 146  
 Postgraduate  
     Courses 46, 85  
     Coursework programs 48, 88  
     Research degrees 46, 85  
 Principles of Object-oriented Programming in  
     Smalltalk 133  
 Principles of Software Development A 122  
 Principles of Software Development B 122  
 Prizes 29, 62  
 Probability and Stochastic Processes 116  
 Procedural Programming 123  
 Programming for Performance 125  
 Programming Fundamentals 124  
 Programming on the Internet 127  
 Project 114, 121  
 Project (Postgraduate) 121  
 Project 1 138  
 Project 2 138

Project A 138  
 Project B 138  
 Project Management 128, 136  
 Project Management and the Professional 123  
 Pure Mathematics 3A 114  
 Pure Mathematics 3B 115

## Q

Quality Control 116  
 Quantitative Modelling 123

## R

Radio Station 2SER (107.3 FM) 11  
 Regression Analysis 116  
 Report 121  
 Research Office 8  
 Resources Management for IT Professionals 128  
 Russian 158

## S

Scheduling Theory 118  
 Scholarships 62  
 School of Computing Sciences 59  
     Academic advisers for 2000 60  
     Alphabetical list of subjects 109  
     Computing Sciences research laboratories 85  
     Numerical list of subjects 102  
     Postgraduate courses 85  
     Prizes and scholarships 62  
     School contacts 64  
     Subject descriptions 121  
     Undergraduate courses 65  
 School of Mathematical Sciences 26  
     Alphabetical list of subjects 57  
     Computing facilities 26  
     Mathematics Study Centre 26  
     Numerical list of subjects 54  
     Postgraduate courses 46  
     Prizes 29  
     School contacts 30  
     Subject descriptions 112  
     Undergraduate courses 31  
 Seminar (Computing) 117  
 Seminar (Mathematics) 117  
 Seminar (Operations Research) 117  
 Seminar (Statistics) 117  
 Simulation Modelling 116  
 Smalltalk 130  
 Software Development Case Study 124  
 Software Quality Assurance 131  
 Sound and Image 144  
 Sound Design 145  
 Sound, Music, Noise 144  
 Sound Studies 144  
 Spanish Language and Culture 156  
 Special Needs Coordinator 9  
 Staff list 163  
 Statistical Consulting 119  
 Statistics 1 113

## 170 Index

- Statistics 2 114
  - Strategic Business Management 139
  - Strategic IT Contract Management 138
  - Student information
    - Continuing Professional Education (CPE) 19
    - Faculty Office contacts 18
    - Graduation ceremonies 24
    - Information for students 17
    - Statement of good practice and ethics in informal assessment 22
  - Student Ombud 11
  - Student Services
  - Students' Association 11
  - Subjects
    - Alphabetical list of subjects 57, 109
    - Bridging 27
    - Descriptions 112
    - Exemptions 28
    - International Studies 148
    - Numerical list of subjects 54, 102
    - Offered by other faculties 139
    - School of Computing Sciences 121
    - School of Mathematical Sciences 112
    - Sub-majors offered to students enrolled in other faculties 19
  - Systems Design 124
  - Systems Design and Development 123
  - Systems Development (Objects and Processes) 135
  - Systems Integration 137
  - Systems Modelling 122
  - Systems Programming 129
  - Systems Software and Networks 123
- T**
- Thai 154
  - Theories of the Visual 143
  - Theory of Financial Decision Making 142
  - Thesis 142
  - Thesis (Honours) 120
  - Thesis Seminar A 120
  - Thesis Seminar B 120
  - 3D Computer Animation 125
  - 3D Computer Animation 1 147
  - 3D Computer Animation 2 147
  - Time Series Analysis 119
  - Total Quality and Productivity Management 139
  - 2D and 3D Communication 147
- U**
- Undergraduate courses 31, 65
  - Union, UTS 10
  - University Graduate School 9
  - UNIX Systems Administration 133
  - User Documentation 1 146
  - User Documentation 2 147
- V**
- Video Basic 145
  - Virtual Communities 125
- W**
- Welfare 9
- Y**
- Youth Allowance 8

# UTS CONTACTS

---

## University of Technology, Sydney

### Postal address

PO Box 123  
Broadway,  
New South Wales, 2007, Australia

### Telephone

(02) 9514 2000  
International: +61 2 9514 2000  
Fax: (02) 9514 1551

### World Wide Web

<http://www.uts.edu.au>

## City campus

### Broadway

- Building 1 (Tower Building)  
1 Broadway, Ultimo
- Building 2  
1 Broadway, Ultimo
- Building 3 (Bon Marche Building)  
Cnr Harris Street and Broadway, Ultimo
- Building 4  
Cnr Thomas and Harris Streets, Ultimo
- Building 6 (Peter Johnson Building)  
702–730 Harris Street, Ultimo
- Broadway Terraces  
9, 11 and 13 Broadway, Ultimo
- Magic Pudding Childcare Centre,  
Thomas Street, Ultimo

### Haymarket

- Building 5  
Cnr Quay Street and Ultimo Rd, Sydney

### Blackfriars

- Cnr Blackfriars and Buckland Streets,  
Chippendale
- Blackfriars Childrens Centre  
Buckland Street, Chippendale

### Smail Street

- 3 Smail Street, Ultimo

### Quay Street

- 10 Quay Street, Sydney
- Prince Centre,  
Cnr Quay and Thomas Streets

### Wembley House

- 839–847 George Street, Sydney

### Harris Street

- 645 Harris Street, Ultimo

### Student housing

- Bulga Ngurra  
23–27 Mountain Street, Ultimo
- Geegal  
82–84 Ivy Street, Ultimo

### Institute for Sustainable Futures

- National Innovation Centre  
Cnr Garden, Cornwallis and  
Boundary Streets  
Eveleigh, NSW, 1430  
Telephone: (02) 9209 4350  
Fax: (02) 9209 4351

## Kuring-gai campus

- Eton Rd, Lindfield  
(PO Box 222, Lindfield, NSW, 2070)

## St Leonards campus

- Dunbar Building  
Cnr Pacific Highway and  
Westbourne Street, Gore Hill
- Clinical Studies Building, Centenary  
Lecture Theatre and West Wing  
Reserve Road, Royal North Shore Hospital
- Gore Hill Research Laboratories  
Royal North Shore Hospital

## Yarrawood conference and research centre

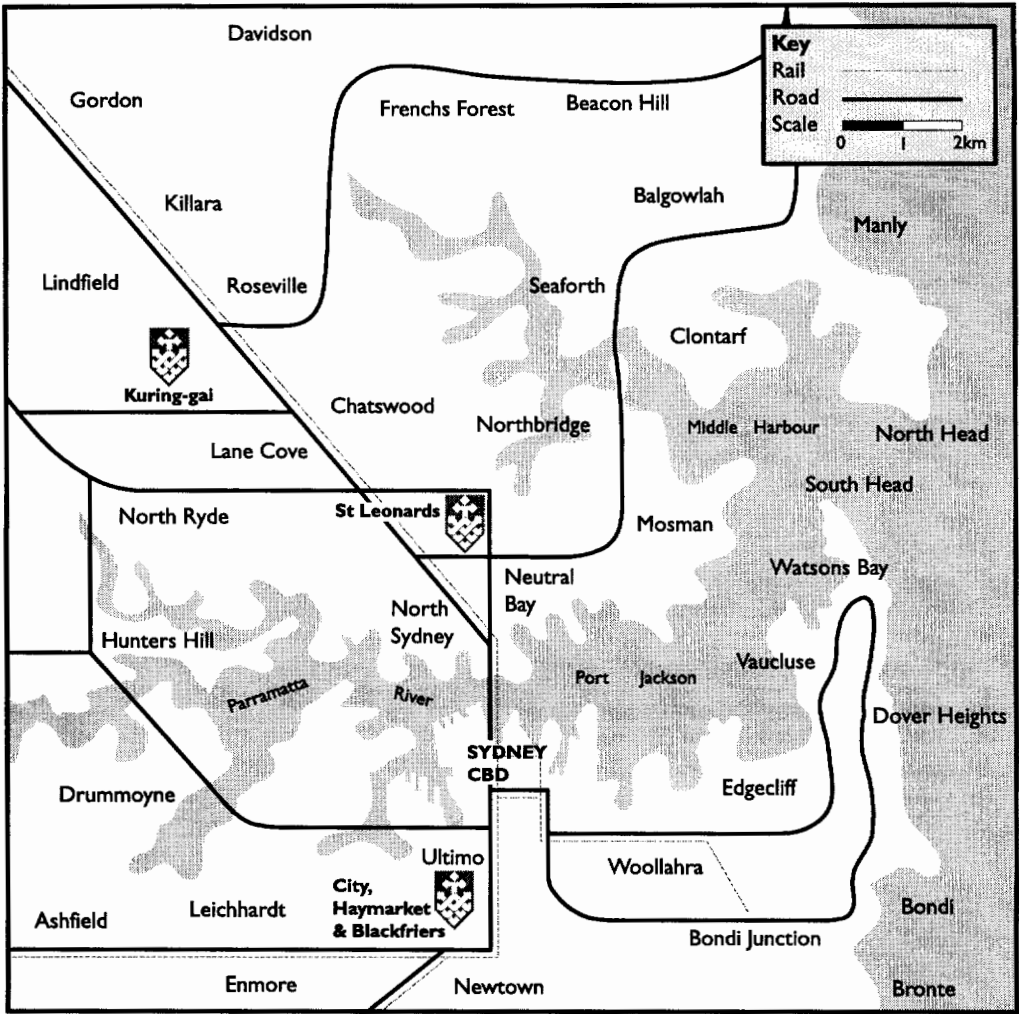
- 689 Springwood Road  
Yarramundi, NSW, 2753

## Stroud Field Station

- 2605 The Bucketts Way  
Booral, NSW, 2425

# MAPS

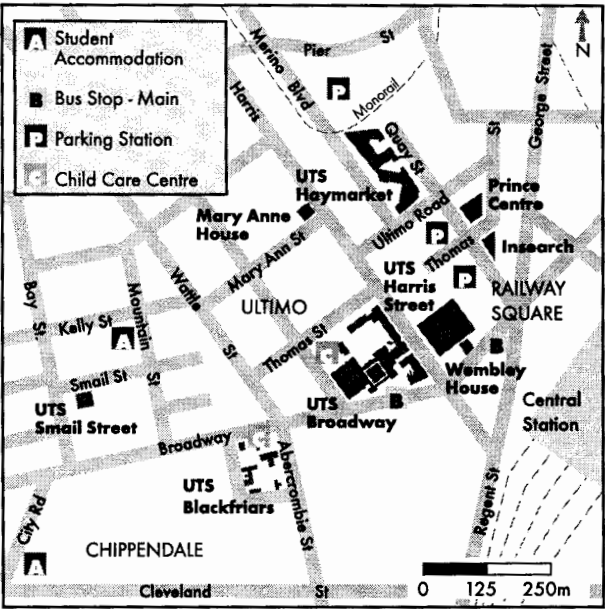
Sydney regional map



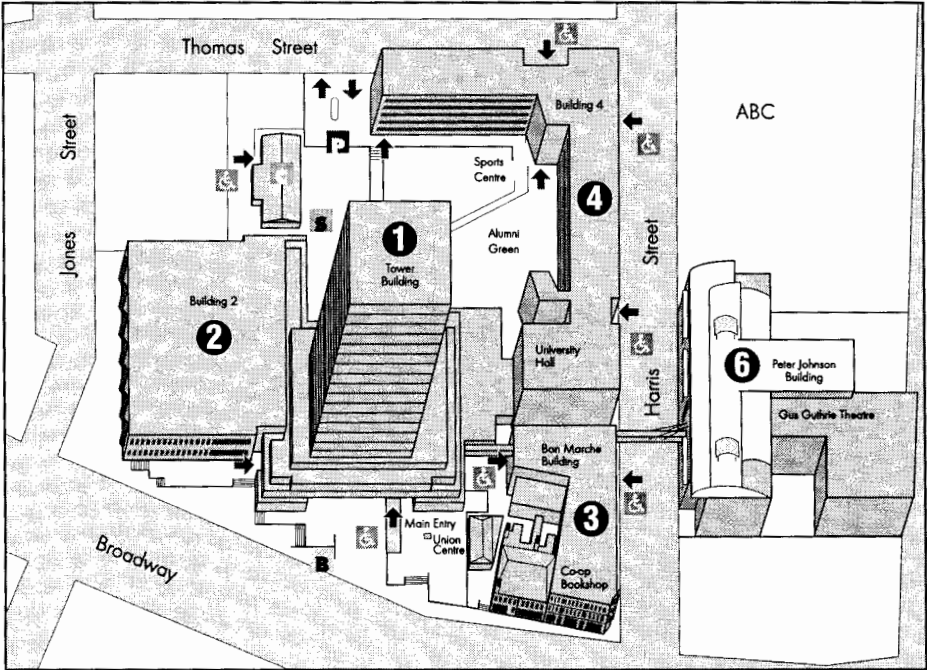
**KEY**

- ➔ Entry/Exit
- ♿ Disabled access
- B Main bus stop
- S UTS shuttle bus
- P Parking
- ① Building numbers
- ⌂ Child care

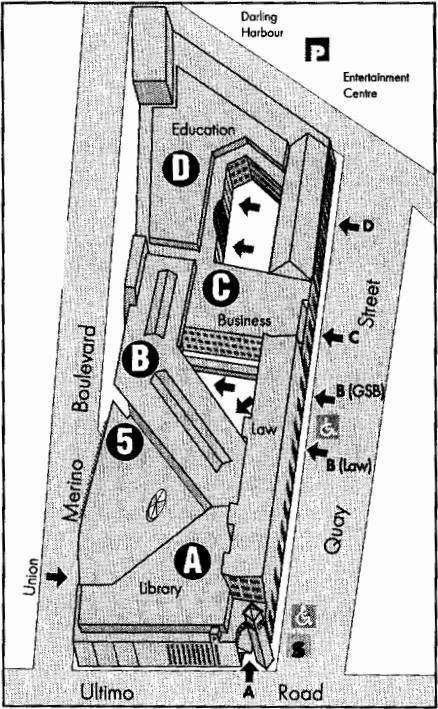
City campus



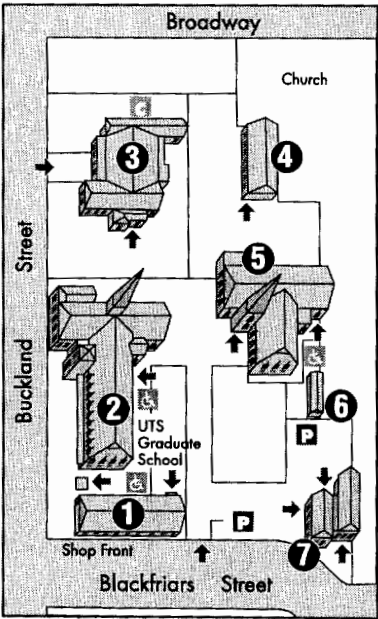
Broadway



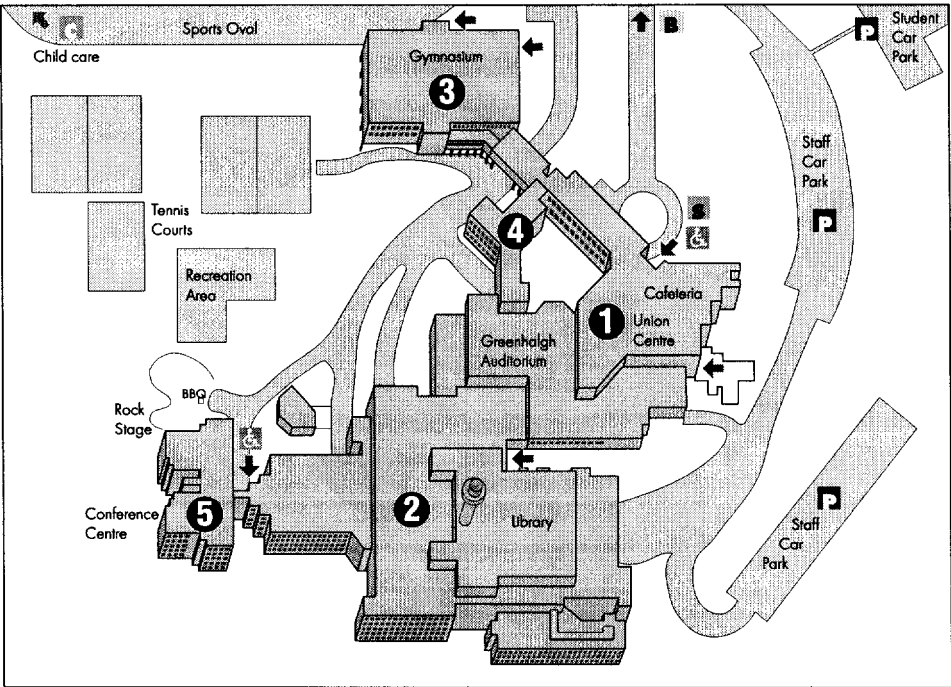
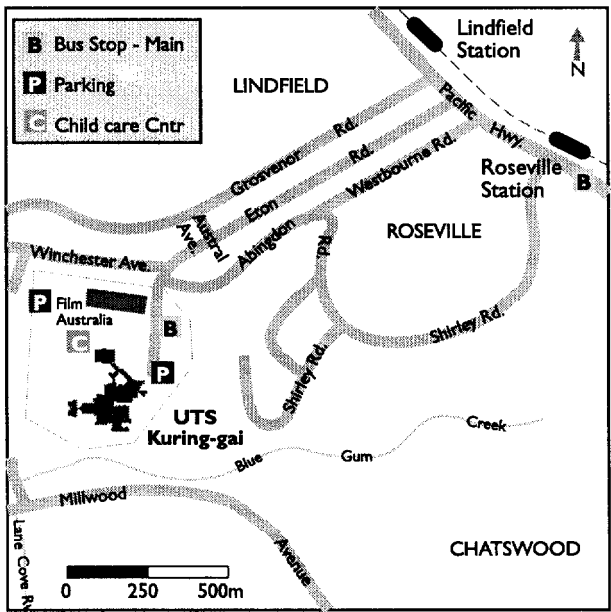
Haymarket



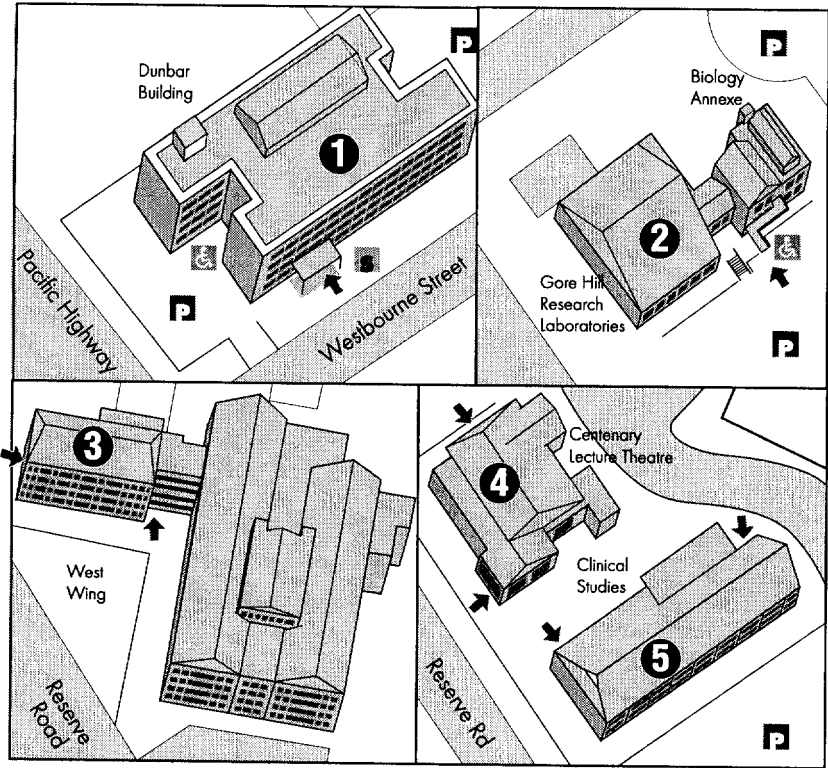
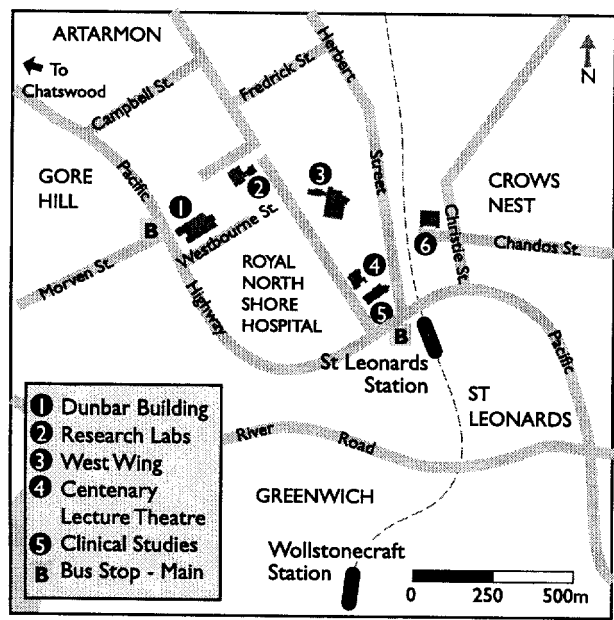
Blackfriars



Kuring-gai campus



St Leonards campus



**University of Technology, Sydney**

PO Box 123

Broadway NSW 2007

Australia

Telephone (02) 9514 2000

**Course inquiries within Australia**

Information service (02) 9514 1222

email [info.office@uts.edu.au](mailto:info.office@uts.edu.au)

**International inquiries**

International Programs +61 2 9514 1531

email [intlprograms@uts.edu.au](mailto:intlprograms@uts.edu.au)

**World Wide Web** <http://www.uts.edu.au>

**ISSN 1328-9268**

Price \$10