A database containing all course information in this Handbook is on the University’s website at: www.vu.edu.au.

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Caution: This Handbook provides a guide to courses available within the Faculty of Engineering and Science at the University in 2002. The Handbook cannot hope to cover all of the various options adequately, although it attempts to be as accurate as possible, and students should always check with the relevant faculty or school officers in planning their courses. The Handbook also includes descriptions of courses that may be altered later or that may not in fact be offered due to insufficient enrolments or changes in teaching personnel. The fact that details of a course are included in the Handbook can in no way be taken as creating an obligation on the part of the University, faculty or school to teach it in any given year, or to teach it in the manner described. The University reserves the right to discontinue or vary courses at any time without notice.

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Welcome to the Faculty of Engineering and Science Handbook 2002. The Handbook is designed to provide students with detailed information on course structure, subject content, on-Campus facilities and University regulations and procedures required for the successful completion of study.

The Introduction to this Handbook lists all undergraduate and postgraduate courses offered by the Faculty of Engineering and Science. The undergraduate section outlines the requirements and structure of all undergraduate courses offered by individual Schools within the Faculty of Engineering and Science. The credit point value for each subject is included with the course details. The course outlines are followed by a detailed description of all undergraduate subjects, which are listed in alphabetic order according to their subject code. The postgraduate section follows the same format, outlining each course offered followed by a description of all postgraduate subjects.

The back sections of the Handbook include useful information about articulation and credit transfer, recognition of prior learning, admission and enrolment procedures and services available to students.

Handbook on the web
A database containing all course information in this Handbook is on the University’s website at: www.vu.edu.au.

Credit points
Victoria University has a credit points system in which each subject is given a value according to its academic weighting. To complete each year of a course, students must complete subjects to the value of 120 points. For more information on credit points, see the Admissions, Enrolment and Academic Procedure and Regulations section in the back of this Handbook.

Please note
The attention of all students and prospective students is drawn to the possibility that due to circumstances that presently cannot be foreseen, the details of the programs, courses and subjects set out in this Handbook might change after the date of publication. Accordingly, before final decisions are made or enrolment occurs based on information contained in the Handbook, each student or prospective student should contact the Faculty Executive Officer on (03) 9688 4191 to ensure that the pertinent information is still accurate.
Welcome to the Faculty of Engineering and Science at Victoria University and to one of the most exciting periods in your life. Your studies over the next few years will, naturally, be very important and you will have to be fully committed to your studies if you are to succeed. However, I have no doubt that it will be worth it in the end. We will be doing all we can to help and this guide contains some information which should be of assistance.

The Faculty is divided into three Schools, namely: The Built Environment, Communications and Informatics, and Life Sciences and Technology. There are also four Research Centres; Bioprocessing and Food Technology, Environmental Safety and Risk Engineering and Packaging, Transportation and Storage, and the Australian Food Marketing Centre which operate at the forefront of knowledge.

A joint venture between the University and the Austin Research Institute has resulted in the formation of the Victoria Institute of Biotechnology and the location of a Centre for Drug Development and Design on the Werribee Campus.

The Faculty of Engineering and Science provides students with a sound scientific training with strong emphasis on practical skills and problem solving that equips them well for a range of professional careers. It offers a comprehensive range of courses in science and engineering up to PhD level.

The courses have been developed to meet the vocational needs of students, and special care has been taken to consult the professional organisations to ensure that graduating students receive professional recognition for their qualifications. Students will find the staff of the Faculty willing to help and advise them during their studies. Staff members also take a keen interest in the job placement and careers of graduates.

There is more to university life than just study and I urge you to make the most of all social opportunities Victoria University and student life has to offer. I would especially recommend you become involved with any student society our Faculty has to offer.

Make the most of the opportunities that are before you and best wishes for your time with us now and beyond.

Professor Albert E.J. McGill
Dean, Faculty of Engineering & Sci.

Research

Currently, research is being undertaken within the Faculty by academic staff, visiting researchers, post-doctoral fellows and postgraduate students, often working in teams. Research by postgraduate students enrolled in higher degrees under the supervision of academic staff is an integral part of the Faculty’s research effort. Through the research training provided to these students the Faculty seeks not only to meet the immediate needs of the student and industry but also to play a major role in developing Australia’s future research personnel and prospective academics.

Research Strategy Plan

The University's Research Management Plan proposes that the University aims for excellence in its research programs and seeks to be a major contributor to research and development activities related to scientific, technological, social and economic issues of relevance to the region and the nation. In particular, the University values the effect that research and development can have in solving community, business and industrial problems and strengthening community links with higher education institutions.

The Faculty of Engineering and Science, as a major research component of the University, seeks to make a significant contribution to the University’s research plan through:

• the development of a broadly-based Faculty Research Strategy Plan based on the major research areas of environmental safety and risk engineering, biotechnology and food technology, mobile communication and signal processing, and packaging and handling, together with the strategic areas of growth in industrial automation and power systems, transport and distribution, and complementary research activities in building services; dynamics, vibration and modal analysis; computer imaging and vision systems; high performance computing and networking; and, urban water systems;

• increasing the competitive position of current strengths and developing new and expanding areas of research within the above major research areas and strategic areas of growth in such a way as to attract adequate research funds;

• developing cross-disciplinary research projects drawing on expertise from a number of departments including those from outside the Faculty;

• encouraging researchers with international or national reputations for excellence in their chosen fields to work as individuals or in small groups.

Major Research Areas

Environmental Safety and Risk Engineering

The University Centre for Environmental Safety and Risk Engineering undertakes multi-disciplinary studies that are concerned with the assessment of risks and the identification of cost-effective designs for infrastructure facilities related to safety. These facilities present a threat to the safety of life, property and the natural environment arising from fire and other hazards. Currently major research effort is directed at the development of
cost-effective fire safety system designs for buildings. The Centre is also undertaking a major program of reform of existing building codes and the development of new fire engineering design codes for Australia.

**Communication and Optical Technology**

This field of research encompasses the major electrical engineering areas of mobile communications: system design, digital signal processing and communication software together with the powerful optical technology area of Applied Physics. All perspectives focus on developmental aspects including efficient modulation schemes for mobile channels, power amplifier linearisation, development of computer aided software engineering tools and expert systems for mobile network management.

**Packaging, Transportation and Storage**

This multi-disciplinary research area involves applications of disciplines such as dynamics, chemistry, food science, materials science, management, heat and mass transfer, robotics, environmental science to the technological advancement in the field of packaging, transportation and storage. The studies focus on numerical modelling and laboratory simulations of the physical distribution environment, evaluation and assessment of environmental impacts of packaging systems, interactions between product sensitivity and packaging performance, compatibility between product (eg food) and packaging materials, etc.

**Bioprocessing and Food Technology**

Research undertaken in this centre covers more disciplinary studies in the area of food bioprocessing, environmental control and human well being. Studies range from bioremediation and food technology incorporating new products and processes through animal and human studies looking at fertility, reproduction and cellular regulation, to improving human health at large, by incorporating nutritional, pharmacological and physiological intervention approaches. In order to measure desirable outcomes research studies incorporate molecular biology, microbiology, biochemistry and various physiological tools.

**Food Science and Biotechnology**

The Food Science and Biotechnology Research Unit (FSBRU) is a recognised key research unit within the Faculty and one of the lead participants in the University's Key Research Area on The Integrated Food Value Chain. The unit facilitates an integrated, multidisciplinary approach to research and brings together much of the University's resident expertise in the broad areas of microbiology, molecular biology, biochemistry, biotechnology and food science and technology, as well as incorporating the expertise of the Biocatalytic Synthesis Unit (BISUN).

**Reproduction and Family Health**

The Reproduction and Family Health Research Unit examines the many facets of reproduction and family health while focussing on perinatal development. In particular it links physiology, psychology, pharmacology, nutrition and natural medicine to provide a multidisciplinary approach to investigate foetal programming of adult disease, the role of the placenta in foetal growth and development in diabetes, control of ovarian function, hormone replacement therapy, implantation, embryo development and the effect of stress on well being.

**Strategic Areas of Growth**

**Conservation Biology Group**

The Conservation Biology Group has broad research interests, encompassing topics of interest to students with a focus on the conservation of species, their habitats, and the biological impacts of pollution and other aspects of global change such as the greenhouse effect. Research in this group also includes the ecology of aquatic and terrestrial ecosystems, in some cases with an emphasis on practical implications for improved management practices.

**Industrial Automation and Power Systems**

Expert systems incorporated with adaptive control and fuzzy logic controllers are applied to the control and supervision of generation, distribution and protection of power systems. Application of expert systems to control industrial process manufacturing plants are applicable to the petrochemical, and chemical steel production industries.

**Transport and Distribution**

The geographical location of the University places it at the transport hub for South East Australia with access to ports, airports, railroads and the trunk road network. Research has commenced with an initial focus on the Western Ring Road and a multidisciplinary emphasis on the analysis of the social, commercial and environmental influences of the road's construction.

**Complementary Research Activities**

Complementary Research Activities are conducted by groups which operate independently, but seek to relate their work to the University's Major and Strategic Research Areas.

**Building Services**

Building services systems are the hidden 'architecture' behind every building providing air conditioning, ventilation, light and power distribution, fire safety, sanitary plumbing and drainage. Research in building services at the University is carried out in the areas of optimisation of air conditioning systems, computational fluid dynamics of air movement in buildings, and the supply and internal distribution of water.

**Computer Imaging and Vision Systems**

Research is carried out on production and processing techniques which enhance communication and flexibility between devices and people. The five component research areas linked in this area are: parallel processing; image processing; computer networking; software engineering; and operator machine interfaces.

**Dynamics, Vibration and Modal Analysis**

This area is concerned with the methods of analysis of vibration and noise. It is focused on the modal analysis (ie. the process of determining the vibration parameters) and the experimental methods of excitation and vibration in complex structures.

**Urban Water Systems**

Research is focused on the integrated planning and management of urban water systems. The current research projects include water supply planning and operation, reuse of greywater and stormwater, water quality in rivers, urban drainage and groundwater flow modelling.

**Specific Research Topics**

By classifying its areas of research in the above manner the Faculty seeks to focus its activities and place them in perspective. With each of these areas the specific research topics currently being pursued by postgraduate students are however many and varied. Typical research topics are listed in the School sections of this Handbook.
The Facilities of the Faculty

Computers Facilities
The Faculty gives high priority to the provision of quality facilities for computing-based instruction and research. The University's centrally-sited computing facilities are complemented by special dedicated facilities within the Faculty and its various schools.

The Faculty provides computer laboratories which include a DEC (Alpha) UNIX file server with 20 workstations, and two Computer Aided Design Laboratories with 50 PCs running a wide range of Commercial Design software.

Several SUN UNIX research workstations and a DEC Alpha UNIX file server with two high powered workstations to provide a basic computing infrastructure for the research laboratories at Werribee Campus.

These laboratories provide an extensive range of engineering application software (CAD, FEA, MatrixX, Solid and Surface Modelling and Computational Fluid Dynamics) with access to Email and AARNET.

An Open-Access Notebook laboratory has also been established with network ports for notebooks/laptops and desktop PCs is available to all university students to access the university network.

The Faculty also provides a draughting facility which is used by first year students.

Laboratories
The Faculty provides special laboratories for mechanical engineering students in thermodynamics, heat-transfer, vibration and modal analysis, air conditioning, fluid mechanics, mechanics of machines, automatic control, computer applications, solid mechanics, dynamics and testing, ocean engineering, wind tunnels, cable testing and materials science.

Special facilities for electrical and electronic engineering students are provided in the electronics, communication, mobile radio, control, industrial automation, power systems, microprocessor and computer technology and software engineering laboratories.

The Faculty also provides special laboratories for civil and building engineering students in fluid statics and dynamics, structures, concrete mixing, testing, cutting and geology, soil mechanics, building thermal services, and lighting. Industry standard software is used in all civil and building computing laboratories.

For laboratory-based research, standard equipment is complemented by special facilities. Of special interest are the laboratories associated with Centres established within the Faculty. These centres are:

- the University's Research Centre for Environmental Safety and Risk Engineering
- the University's Research Centre for Packaging, Transportation and Storage
- Centre for Communication and Optical Technology
- Centre for Industrial Automation and Power Systems
- Vibration and Modal Analysis Group
- Computer Imaging Group
- Engineering Research and Consultancy Centre (ERCC)

The School of the Built Environment operates several specialist laboratories used for both teaching and research:

- **Mechanics Laboratory**: Dynamics, Vibrations, Acoustics, Modal Analysis, Mechanics and Structural Engineering
- **Thermodynamics Laboratory**: Heat Transfer, Thermodynamics, Internal Combustion Engines, Air-Conditioning, Refrigeration
- **Fluid Dynamics and Environmental Engineering Laboratory**: Aerodynamics, Turbulence, Particle Image Velocimetry, Water Resources Management and Waste Management
- **Geomechanics Laboratory**: Soil Mechanics, Geomechanics and Soil Properties
- **Materials Engineering Laboratory**: Metallurgy, Composite Materials, Polymer Engineering, Material Properties, Building Materials and Properties of Concrete
- **Building & Surveying Laboratory**: Building Design, Building Services, Lighting Design and Surveying

Over the past five years, the School's laboratories have been developed into state-of-the-art facilities comprising a large number of expensive and sophisticated research and teaching equipment. These laboratories accommodate a large number of experimental activities related to the School's teaching and research activities. Each laboratory is managed by a Technical Officer under the guidance of senior academic staff.

Through these Centres graduate students can gain access to the equipment and laboratories in associated organisations such as BHP, CSIRO and other universities.

Testing Facilities

The Engineering Research and Consultancy Centre (www.vu.edu.au/foes/ercc) is the commercial arm of the School of the Built Environment at Victoria University. It was established in 1982 to make the School's wide range of experimental facilities and engineering expertise available to industry and the community. Since then, the Centre has been involved in numerous projects and the School's laboratories have continually been upgraded with state-of-the-art equipment. The Centre's research and consultancy activities are managed by academic and consultancy staff, and supported by a well-equipped workshop and proficient technical staff. Whenever possible, undergraduate and postgraduate students are invited to participate in these projects. The Engineering Research and Consultancy Centre can provide expert advice as well as specialist research and consultancy services in Engineering-related fields such as Environmental & Structural Dynamics and Acoustics, Structural Mechanics, Fluid Dynamics and Aerodynamics, Water resources and Geomechanics, and Post-harvest technology. The Centre offers the additional advantage of a 125% tax concession for eligible research projects.

The Centre for Environmental Safety and Risk Engineering operates an Experimental Building-Fire Facility. The three-storey Facility can be fitted out to represent a wide range of prototype building occupancies and used to conduct realistic fire experiments in actual building layouts. The $1.5m Facility, located at the Country Fire Authority Training College at Fiskville (near Ballarat) was initially funded under an Australian Research Council Mechanism C Infrastructure Grant. Additional ARC Infrastructure Grants have been awarded to the Centre for the Facility. Significant resources and input were provided by industry. Results obtained from the Facility are used to help
develop and validate mathematical models for the growth and spread of fire in buildings and the response of building components to the presence of fire. In addition, a major Fire Research Furnace has been installed at the Centre’s new laboratory and office complex located at the Werribee campus. The furnace will be used to assess the performances of elements of construction under fire conditions. A cone calorimeter has also been installed at the Werribee Campus.

The Centre for Packaging, Transportation and Storage provides access to excellent research and experimental facilities across the University in many of the disciplinary areas. Examples are facilities for permeation and migration studies, electronic-nose facilities for off-flavour studies and a variety of equipment for studying mechanical and physical properties of modern packaging materials. The Werribee-based packaging dynamics laboratory represents a total investment of more than $2 million and is used for research experiments and is also available for testing and consulting work for industry. The facility is the only one in Australia accredited by NATA to perform certification testing for all types of packaging suppliers as well as packaging users. Full scale performance testing, fragility analysis, simulation of transport and storage conditions, determining of cushioning and other material properties are examples of experimental work that can be performed.

**Bridging Program**

The Faculty of Engineering and Science offers a bridging program over the January/February period to enable students who successfully complete the program to enter courses in the Engineering and Science fields of study. The aim of the program is to give students the confidence to tackle their first year studies at Victoria University. It does not duplicate year 12 studies but seeks to give students the essential skills and knowledge to gain entry to our courses. It is particularly suitable for students returning to study after some time away, those whose recent educational results have not been at the level of which they are capable of performing, those whose background in science lacks some essential part or those who wish to change direction in their education.

This program is specifically designed to meet individual needs offering a choice of subjects and either evening or day time study.

**Successful completion of the bridging program will guarantee entry to all courses in the Faculty of Engineering and Science.**

**Travelling Careers Troupe**

The Faculty of Engineering and Science seeks to raise all students’ and teachers’ awareness of our courses in engineering and science and why they should be considered as viable career options. The Faculty Liaison Officer, lecturers and current students visit interested schools to do activities or to talk with students, and to provide them each with an information kit.

**Faculty Tours and Workshops**

Schools are also invited to visit the University to participate in workshops and tours of the Faculty. Current students are encouraged to participate.

Enquiries from interested students and teachers are welcome. For further information and advice please contact the Faculty Liaison Officer, through the Faculty Office on (03) 9688 4241.

**Postgraduate Scholarships**

In addition to Australian Postgraduate Research Awards, Postgraduate Industry Research Awards and Victoria University Graduate Scholarships, the Schools of the Faculty are also able to offer scholarships for specialist research within their Schools.

Enquiries for details of these latter scholarships should be directed to the Head of the School concerned.

**Further Information**

Further information about courses and research programs may be obtained from the Faculty of Engineering and Science Office, Victoria University, PO Box 14428 MC, Melbourne VIC 8001, telephone (03) 9688 4516 or by facsimile on (03) 9688 4513.
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Jun-de Li  BEng(Hons)/Tsinghua, PhdMelb  
Mervyn Minett  CertMechEng, BEFFIT  
Mariusz Paks  MEngScTechWarsaw, AM ASHRAE, MAIRAH  
Vinayaga Sarma  BScGlas, MEngScBirm, CEng, MIEAust, MAE, MIEEE, MAIBE  
S. Eren Semercigil  BSc(Hons), MScMETUTurkey, PhDManit  
Danh Tran  BE(Hons), BSc, PhDCan, MEngScMelb, MIEEE  

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Kevin Hunt  BEng, MEngScMelb  
Josef Rojter  BSc, MEngScMonash, MIM, MSPE  
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Michael Carey BSc(Hons), DipEd, PhDNE
R. John Casey BSc(Hons), DipEd, PhDN'leW/N'SW,
GradDipEdAdminMells, DipEd, MEDstaMonash, FRACI, CChem
Geoffrey Hamilton BSc(Hons), PhDUN'VeW, MRACI, CChem
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PhDLaT, MRACI, MScA, ARSC, AAIFST
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BAppSc(MedLab)RMIT, MAIMS, MPH, MABA
Grant Stanley BE(Chem), PhD Mells, MABA

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DipEdHawthorn, BSc(Ed)(Science)W'At, MEnvScMonash,
DEdMells, MAIP, MACEA, PhD
Kathy Tangalakis BSc(Hons), PhD Mells

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CChem
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GradDipEdHawthornInstitEd, MPHMonash
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Bronwen Scott BSc(Hons)Brisl, GradCertEdCU, PHDcu
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ASP(Aust)

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TTTCHawthornInstitEd, DipEdMonash, MRACI, CChem

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Debra Bartolo BScDuskin
Vilnis Ezerienks BAppSc(Hons)V'laMells
Joanne Gatt BSc(Hons) V'laMells
Charmaine Gemmell BSc(Hons) V'laMells
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Administration Officers
Yildiz Djelal
Janet Grady
Judith Thomas
Undergraduate Studies

The Faculty of Engineering and Science offers the following undergraduate courses:

- Certificate in Foundation Studies
- Double Degree courses in:
  - Engineering and Science
  - Engineering and Law
  - Science and Law

Certificate in Foundation Studies

Course Code: JNCY

Course Objectives

The course aims to provide an opportunity for students who:

- have not studied science and mathematics at year 12 level,
- have studied basic science and mathematics at year 12 level but did not achieve appropriate study scores to enable them to satisfy the entrance requirements for courses in the Faculty of Engineering and Science, or
- are returning to studying the sciences after years away from formal education.

Students will generally enrol in English Language and Communication Skills and three other subjects. The other subjects chosen will be governed by the students’ future course choices and their background.

Each student will be assessed at the commencement of the course and those deemed to have appropriate English Language skills will be permitted to enrol in the appropriate Communication subject in their future degree program. Students may also enrol in other degree subjects pending approval of the Course Director.

To successfully complete the Foundation Year, students must obtain a pass in three subjects. Students will be permitted to enter their chosen course of study provided that they have passed the appropriate prerequisite subjects in the Foundation Year.

This would be English Language and Communication Skill, Mathematics, Physics and Information Technology for Engineering and Physical Science courses, and English Language and Communication Skills, Chemistry, Biology and Mathematics for Chemical and Biological Science courses.

Admission Requirements and Prerequisites

Students applying for the course will generally have attempted year 12 studies in VCE or equivalent. The course will require at least year 11 or its equivalent for applicants under 21 and relevant work/life experiences for applicants over 21.

Course Duration

Two semesters of full-time study for one year.

Bachelor of Engineering/ Bachelor of Science

Course Objectives

The combined Bachelor of Engineering/Bachelor of Science course will provide students with a broad ranging program of study and learning aimed at satisfying the academic and professional requirements in both science and the appropriate field of engineering. The double degree course will enable graduates to obtain employment in business and government, in major engineering organisations, private industry and elsewhere.

Course Duration

Five years of full-time study.

Course Structure

Example: Course structure using Electrical and Electronic Engineering and Computer Science as the major Engineering and Science fields of study.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Course Code</th>
<th>Subject</th>
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<tbody>
<tr>
<td></td>
<td>ACE1910</td>
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<tr>
<td></td>
<td>EEC1001</td>
<td>Programming Structures 1.1</td>
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<td>Design Practices</td>
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<td>EEE1001</td>
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<td>EET2002</td>
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<td>SCM2111</td>
<td>Data Comm and Networks 1</td>
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<td></td>
<td>EEA2001</td>
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<td>EEH3202</td>
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<td>EET2502</td>
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<td>SCM5803</td>
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<td>Year 5</td>
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<td>EEC3601</td>
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<td>EEC3704</td>
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<td>EED4000</td>
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<td>SCM3511</td>
<td>Image Processing 2</td>
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### Bachelor of Engineering/Bachelor of Laws

**Course Objectives**

The combined Bachelor of Engineering/Bachelor of Laws course will provide students with a broad ranging program of study and learning aimed at satisfying the academic and professional requirements in both law and the appropriate field of engineering. The double degree course will equip graduates to obtain employment in law, business and government, in major engineering organisations, at the Bar and elsewhere.

**Course Duration**

Six years of full-time study.

**Course Structure**

*Example:* Course structure using Electrical and Electronic Engineering and Law.
FACULTY OF ENGINEERING AND SCIENCE

BLB3134  Taxation Law
EED4000  Design & Project Management 4.0
EET4701  Communication Systems 4.1
EET4702  Communication Systems 4.2

Year 6
BLB3127  Dispute Resolution and Civil Procedure
BLB3128  Criminal Law
BLB3130  Interviewing and Negotiating Skills
BLB3131  Lawyers and Legal Ethics
BLB4136  Equity and Trusts
BLB4139  Evidence
BLB4141  International Trade Law
BLB4142  Advanced Legal Research Dissertation

Bachelor of Science/ Bachelor of Laws

Course Objectives
The combined Bachelor of Science/Bachelor of Laws course will provide students with a broad ranging program of study and learning aimed at satisfying the academic and professional requirements in both law and the appropriate field of science. The double degree course will equip graduates to obtain employment in law, business and government, in major scientific organisations, at the Bar and elsewhere.

Course Duration
Five years of full time study.

Course Structure
Example: Course structure using Biomedical Sciences and Law.

Year 1
ACE1910  Communications for Science
BLB1101  Aust Legal System in Context
BLB1114  Legal Research Methods
SBM1514  Functional Anatomy 1
SBM1518  Human Physiology
SBM1524  Functional Anatomy 2
SCS1110  Chemistry for Biological Sciences A
SCS1120  Chemistry for Biological Sciences B

Year 2
BLB1102  Contracts 1
BLB1117  Contracts 2
SBM2260  Diet and Nutrition or
SBM2560  Biochemistry
SBM2530  Pathophysiology 1
SBM2540  Pathophysiology 2
SBM2800  Cardiorespiratory & Renal Physiology

Year 3
BLB1113  Australian Administrative Law
BLB1115  Torts
BLB1116  Law, Discrimination and Society
BLB1118  Constitutional Law
SBM2810  Pharmacology
SBM3590  Advanced Histological Techniques
SBM3660  Developmental and Clinical Genetics
SBM3720  Immunology

Year 4
BL.B2119  Corporations Law 1
BL.B2120  Legal Writing and Drafting
BL.B2121  Legal Theory
BL.B2123  Advocacy and Communication
BL.B2124  Corporations Law 2
BL.B2125  Real Property Law
BL.B2126  Federal Constitutional Law
BL.B3134  Taxation Law

Year 5
BL.B3127  Dispute Resolution and Civil Procedure
BL.B3128  Criminal Law
BL.B3130  Interviewing and Negotiating Skills
BL.B4136  Equity and Trusts
BL.B4139  Evidence
BL.B3131  Lawyers and Legal Ethics
BL.B4141  International Trade Law
BL.B4142  Advanced Legal Research Dissertation

Combinations for the Double Degree programs may be selected from the following:

Engineering
Architectural Engineering
Building Engineering
Building Surveying
Civil Engineering
Computer Engineering
Electrical and Electronic Engineering
Mechanical Engineering
Multimedia Telecommunications

Science
Applied Physics and Computing
Biomedical Sciences
Computer Science
Computer Science and Aviation
Computer and Mathematical Sciences
Computer Technology
Conservation Biology and Environmental Management
Environmental Engineering
Mathematical Sciences
Medical and Environmental Biotechnology
Medical, Forensic and Analytical Chemistry
Nutrition and Food Science
Optoelectronics
School of the Built Environment

Courses Offered
The School of the Built Environment offers undergraduate courses leading to the award of:

- Bachelor of Engineering in:
  - Architectural Engineering
  - Building Engineering
  - Building Surveying
  - Civil Engineering
  - Mechanical Engineering
- Bachelor of Science in:
  - Engineering and Business
  - Environmental Engineering

A degree with Honours program is offered concurrently with the fourth year of the engineering degrees. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode) will be offered honours candidacy if they have achieved at least a credit average over year levels one to three.

The Scope of Architectural Engineering

The degree in Architectural Engineering is an exciting new development involving studies in Architecture, advanced environmental services and life safety system design and the integration of Architecture and all engineered building systems.

The need for a degree in Architectural Engineering has arisen from the increasing complexity of all building systems during the past 10-20 years, and an increased level of client demand for buildings and building systems that better meet their needs.

At Victoria University, Architectural Engineering focuses on the development of planning and design skills for engineered environmental services systems. The course blends selected ‘creative’ Architecture skills into an Engineering degree framework, so that graduates are better enabled to work closely and in harmony with Architects in the design of buildings to delight both clients and end users.

This choice reflects the worldwide trend and emergence of professional Engineering societies whose role is to ensure that the highest standards of design and construction of such engineered systems are achieved. In Australia, both the Society for Building Services Engineering (Institution of Engineers – Australia) and in Victoria, defined professional engineering design roles within the Victorian Building Control Act, are recent examples of this development.

Architectural Engineering graduates will have strong technical and communication skills, and a good understanding and appreciation of Architectural design practice as well as the economic, and social environment in which they will operate. The ongoing and increasing need for building infrastructure development will ensure there will be a significant demand both locally and overseas for graduates with such highly specialised skills, founded on a broad yet integrated building technology base.

Employment opportunities will exist with private consulting firms, contractors, and government agencies throughout Australia and overseas. Exciting and flexible opportunities exist for Architectural Engineering graduates to play a vital role in:

- the private sector including consulting, contracting, construction and project management firms specialising in building environmental and life safety systems in the multi-billion dollar national and international building industry.
- the public sector including Federal, State and Local Government.

The Scope of Building Engineering

Building engineers are involved in the entire building process, from planning and financial feasibility studies, through detailed design of structures and services systems, site excavation and construction, to the final commissioning of buildings and systems prior to occupation.

They require multi-disciplinary training which includes structural action, thermo-fluid and electro-magnetic systems, building construction technology, construction and project management as well as an understanding of legal and economic processes involved in building construction. Building Engineers are (thus) experts in at least one of the following disciplines:

- building structural systems,
- building services and life-safety systems, or
- planning and management of construction of building projects.

Building Engineering graduates have strong technical and communication skills, and a good understanding and appreciation of the environmental, economic, social and legislative environment in which they must operate.

The ongoing and increasing need for building infrastructure development will ensure there will be a significant demand for graduates with a broad yet integrated set of skills in this area, both locally and overseas.

Employment opportunities exist with private consulting firms and contractors, government agencies and authorities throughout Australia and overseas. Exciting and flexible opportunities exist for Building Engineering graduates to play an important role in:

- the private sector (consulting, contracting, construction and project management firms specialising in the multi-billion dollar national and international building industry).
- the public sector including Federal, State and Local Government.
- diverse areas such as urban planning and design; risk assessment and management; energy efficient building design and development.

The Scope of Building Surveying

Building Surveyors belong to a long established profession which operates at the highest level in the building industry. They ensure that all other building professionals meet the standards of safety and functionality required by the community. In 1996 performance based building regulations were introduced as an alternative to traditional ‘cook book’ regulations which limit the materials of construction and layouts of buildings. Performance involves the engineering design of novel building solutions which demonstrate safety to the regulatory authorities and also demonstrate maximum functionality and cost effectiveness to clients.
There is now a great demand for Building Surveyors to have skills in building engineering and law are provided in this new degree. This degree is the first engineering based Building Surveying qualification in Australia. The degree provides skills in the traditional building engineering areas of structures, building services, construction and project management. It also provides the skills for traditional and new performance building regulations, as well as for the new profession of fire engineering. Approximately 70% of all building regulations concern fire safety. Few building surveyors and engineers have these new skills. Recent graduates who have undertaken studies in these new areas have been eagerly sought by employers. The broad range of skills taught in the degree provides graduates with a great variety of career opportunities in engineering, as well as in Building Surveying. The breadth of the degree will maximise graduates’ opportunities to obtain rewarding careers in a rapidly changing world. The degree provides a good base for continuing career education and development in engineering, management and law.

The new degree follows the internationally renowned fire research undertaken at the University, particularly in the development of Australia's new performance and fire regulations. The new degree will provide graduates competitive skills for work overseas.

The Scope of Civil Engineering
Civil engineering is defined as the study, design, construction, management, and maintenance of lasting community amenities and infrastructure systems. These include all buildings from houses to high-rise offices, roads, railways, waterways, reservoirs, aqueducts, sewers, and all other facilities which are used to improve convenience and quality of life for the present community and future generations.

There is widespread community concern about conservation issues and environmental degradation at local, national and global levels. At the same time, a rapidly increasing world population is imposing ever-increasing demands on the provision of infrastructure to satisfy basic and more advanced human needs. Such demands are particularly illustrated by the rapid urban growth occurring in many areas, with associated requirements for appropriate types of buildings, energy, transportation, water supply and waste management systems, along with other major community facilities. These conflicting trends have led to an appreciation by many members of the world community that the need for development is substantial, but at the same time such development must be sustainable.

Civil Engineering graduates should have strong technical and communication skills, and a good understanding and appreciation of the environmental, economic, social and political environment in which they must operate.

The increasing need for infrastructure provision allied with substantial forms of development should ensure there will be a significant demand for graduates with a truly integrated set of skills in these areas, both on the local scene and overseas.

Employment opportunities exist with private consulting firms and contractors, government agencies and Local Government authorities in Australia and overseas.

The Scope of Mechanical Engineering
Engineering is the profession in which a knowledge of the mathematical and natural sciences is applied to develop ways to economically exploit the sources of nature for the benefit of mankind. Mechanical engineering, which began to develop as a distinct area of engineering practice in the early part of the last century has now developed into an extremely diverse and complex profession.

Mechanical engineers find employment in government instrumentalities and private enterprise in such wide-spread areas as manufacturing, design of products and machines such as automotive industry, automatic control of machines and processes, heating and air conditioning systems, machine and condition monitoring, hydraulic and pneumatic systems, computer applications – including finite element analysis, computer-aided design and engineering, and research and development in a wide range of fields.

The degree courses are designed to provide the broad education required for the mechanical engineer's professional career. A broad engineering education leaves engineers better prepared to communicate with each other, to avoid technological obsolescence and to learn new skills as technology advances.

The Bachelor of Engineering in Mechanical Engineering program offered by the School is suitable for men and women and emphasises achievement across the mechanical engineering disciplines in concert with problem solving, design, engineering applications, innovation, management of resources and professional responsibility.

In addition to these basic studies, the School of the Built Environment is concerned with bridging the gap between science and basic knowledge on the one hand, and the design and development of useful devices and processes on the other. This is the art of engineering and to teach this art is the primary object of laboratory practice, industrial projects and engineering design. Laboratory practice, which takes many forms, is intended to show how the experimental method is used in the solution of engineering problems. Design experience includes devising means to perform specified tasks such as the design of a device or the synthesis of a system made up of parts having known characteristics.

The Scope of Engineering and Business
Success in the very competitive market of engineering design, development, manufacture and production requires a wide range of different skills. While it is essential that any product must live up to its technical specifications and requirements, it is equally important that its production is well-planned, there is a market, it can be competitively priced, it can be financed and its production can be sustained. If any one of these essentials is missing, then an otherwise outstanding idea for a product or process can flounder.

In the larger corporations, it is normal to find the above skills the responsibility of a number of individuals with product and manufacturing viability spread over a team of employees. However, with small to medium businesses, this team approach is not normally economically possible. It is not unusual to find that a small number of individuals and even sole practitioners are required each with a broad multi-disciplinary base to cover activities ranging from the purely technical to various aspects of business and management such as marketing, sales, tendering, costing, resource management, etc.

The Bachelor of Science in Engineering and Business degree course offered by the School provides suitably trained graduates who can have a general impact in the workplace, but particularly in small to medium businesses involved in innovative and entrepreneurial engineering for the expanding Australian and international marketplace. The course provides a solid grounding in the basic and applied areas of engineering, particularly with
regard to industrial and project design and their integration with a range of essential business skills.

The Scope of Environmental Engineering

There is widespread community concern about conservation issues and environmental degradation at local, national and global levels. At the same time, a rapidly increasing world population is imposing ever-increasing demands on the provision of infrastructure to satisfy basic and more advanced human needs. Such demands are particularly illustrated by the rapid urban growth occurring in many areas, with associated requirements for appropriate types of building, energy, transportation, water supply and waste management systems, along with other major community facilities. These conflicting trends have led to an appreciation by many members of the world community that the need for development is substantial, but at the same time such development must be both ecologically and economically sustainable.

Environmental engineering covers the planning, design, development, maintenance and management of systems to: safeguard air, water, land and habitat quality; provide infrastructure facilities for the protection and enhancement of human health and well-being; use energy and natural resources conservatively and with maximum efficiency; minimise, recycle, treat and safely dispose of solid, liquid and gaseous wastes; and, remedy existing environmental problems and allow sustainable development principles to be practically implemented.

Graduates working in the Environmental Engineering field should have strong technical and communication skills, and a good understanding and appreciation of the environmental, economic, social and political environment in which they must operate. The increasing need for infrastructure provision allied with substantial forms of development should ensure that there will be a significant demand for graduates with a truly integrated set of skills in these areas, both on the local scene and overseas. Exciting and flexible opportunities exist for course graduates to play an important role in improving our life and environmental quality through employment:

• In the public sector (Federal, State and Local Government; e.g. EPA, Natural Resources & Environment, Energy Efficiency Victoria, Municipal Councils);
• In the private sector (consulting, contracting and manufacturing firms specialising in the multi-billion dollar national and international environment industries); and
• In such diverse areas as urban planning and design, land/water/air environment, waste minimisation/recycling/treatment and disposal, and energy development/efficiency/conservation and management.

Computing Facilities

The School gives high priority to the provision of quality facilities for computing-based instruction and research. The University's centrally located computing facilities are complemented by special dedicated facilities within the Faculty of Engineering and Science and the School of the Built Environment.

The School's facilities include four rooms with some 90 Pentium PCs all connected to a central file server and printing facilities. The research computing room also houses two DEC (Alpha) (UNIX) workstations. In addition, most of the School's laboratories contain high-performance computing workstations which, when not in use for experiments, are accessible to students enrolled in the School of the Built Environment. These computing facilities provide an extensive range of modern software for engineering applications such as Computer Aided Design, Finite Element Analysis, Solid and Surface Modelling, Computational Fluid Dynamics, Digital Signalling Processing, Statistical Analysis, Control System Design and Simulation and Kinematics Analysis and Simulation. In addition, major programming languages, spreadsheets and word processing software are accessible from all workstations. Access to e-mail, AARNET and the Internet (limited) are also provided.

The School's multimedia production studio, containing two high-performance PCs connected to colour printers, scanners, audio and video interface devices and CD writers are available to undergraduate and postgraduate students enrolled at the School.

The School's computing facilities are managed by a full-time computer engineer.

Articulation Pathways

Special provision is made for admission into engineering degree courses on the basis of good results for an Associate Diploma in an appropriate field of study. Interested persons should refer to the section on Articulation and Credit Transfer at the back of this Handbook.

Transfer between degree courses with credit for subjects already passed is a possibility.

Academic Progression Guidelines and Unsatisfactory Progress

Each undergraduate course is specified as a unique set of course subjects. The sequence in which these course subjects are normally studied is specified, firstly, by grouping them in course years and secondly, by specifying prerequisites and/or co-requisites for some subjects.

Normally all of the course subjects in a particular course year must be completed and all prerequisite/co-requisite requirements satisfied before enrolment will be permitted in any subject in a subsequent course year. Enrolment in a group of subjects spanning more than two course years is not permitted.

In order to satisfy the academic requirements for a course award, all course subjects must be completed. Such completion may be obtained by:

• being granted exemption in either individual subjects or in course years; and/or
• achieving a grade of P (or higher) in the assessment of each subject; and/or
• being granted compensation in course years.

A stage grading of ‘Year Completed by Compensation’ may be granted if a student:

• has been given final grades in all subjects in the course year; and
• has passed subjects equivalent to more than 80% of total required semester hours for that course year with no assessment at less than N1 grade; and
• has achieved an hour-weighted average mark of at least 50% for all subjects in the year.

A grading of ‘Year Completed by Compensation’ recognises an acceptable overall result but does not constitute a pass in any individual failed subject.

Students who do not satisfy the requirements for a ‘Year Completed by Compensation’ must repeat all failed subjects of that year (or their equivalents) at the earliest opportunity.

Normally, gradings of ‘Year Completed by Compensation’ will not be granted in consecutive years of a course.
Normal progress through a course requires a student to complete any defined course year within one year of equivalent full-time enrolment.

Any of the following may be considered to constitute unsatisfactory progress by a student.

(i) Failure in any subject or unit for the third time.
(ii) Failure in any subject or unit at N2 level for the second time.
(iii) Failure in 50% or more of their assessed enrolment load in any semester or calendar year of study;
(iv) Failure to complete any two consecutive course years within three years of equivalent full-time enrolment,
(v) Failure to complete the course within any maximum period defined by University Statute.
(vi) Failure to meet a conditional enrolment agreement

As otherwise defined in the University Statute and subject to being invited to show cause, a student making unsatisfactory progress will normally be recommended for exclusion from the course.

**Exemptions**

Claims by students for exemptions from subjects of any course on grounds of special experience or having passed equivalent subjects at Victoria University, other universities or colleges in Australia or overseas, should be submitted on the proper form to the Faculty Office accompanied by proof of the relevant qualifications or experience. Forms are available from the School or Faculty Office. Exemption approval is given by notification in writing.

**Study Load**

**Part-time Study**

Part-time study can be approved at any stage of a course since progress is by individual subjects rather than by years. Part-time study involves attending normal day classes. It is unrealistic to expect to complete a degree course entirely on a part-time basis.

**Full-time Study**

Full-time study of the degree courses is over a four-year period, and involves from 22 hours of Class Contact per week.

**Single Subject Enrolment**

Suitably qualified persons may be permitted to enrol for single subjects as a part of their further education but passes in such subjects may not be counted should the students study later for a degree or diploma.

**Supplementary Assessment**

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances.

**Enrolment Amendment**

Enrolment may be changed with agreement by the examiner and Course Co-ordinator. Application must be made on the appropriate form. A change for any semester is without penalty up until the census dates of March 31 and August 31 (refer to published dates). During the second month a late enrolment amendment fee becomes payable and HECS liability continues for subjects discontinued. Thereafter enrolment changes are not normally approved.

**Assignments and Laboratory Reports**

During the semester a lecturer may require students to complete certain assignments and laboratory reports, excursions (and reports of these), projects, library readings, etc. These are an integral part of the course and must be satisfactorily completed by the due date.

If, for any legitimate reason a student believes they will be unable to complete the assignment by the due date, they should obtain prior approval for an extension of time from the lecturer, who may:

(a) grant an extension of time, with or without mark penalty, or
(b) refuse the request.

In general, 80% of assignment/laboratory work must be completed satisfactorily before admission to a final examination (if such is required) or for a pass in the subject (if this is the method of assessment). Each student must maintain a satisfactory record of attendance at lectures, tutorials, laboratory sessions, fieldwork exercises, drawing classes and design sessions.

**Required and Recommended Readings**

For subjects where texts are required, purchase is essential but confirmation by the lecturer should first be sought. Recommended books need not be purchased by students but they may do so if they wish. A limited number of copies of recommended texts are available in the library. Students are reminded that there may be a number of alternative references in the library around the shelf containing the recommended reference book. Students should not dispose of textbooks until their whole course is completed as books used in first year are often again required for reference by students in later years.

**Special Equipment Requirements**

**Instruments and Equipment**

Students must buy the drawing instruments specified for engineering drawing. These will also be required in surveying and other subjects. A clipboard, heavy boots and waterproof clothing are required for excursions or surveying field work. Breakages of University equipment due to misuse must be paid for by students.

**Computers**

University and Department computer facilities are provided for use by students during normal working hours and in extended hours subject to demand. Extensive relevant software is available.

**Electronic Calculators**

Students must have a scientific calculator. Electronic calculators are used in tutorials, laboratory or fieldwork classes and in examinations at the discretion of the subject lecturer. Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

**Borrowing of Equipment**

Students are not permitted to borrow University equipment for use off-Campus except for survey fieldwork and similar authorised purposes, in which case students must sign a loan
form and assume full responsibility for the care of the equipment.

Films and Excursions
Where films or slides are shown as part of a lecture series, these should be attended by all students of the subject since the material covered cannot be presented in notes or textbooks and is examinable. Similarly, excursions outside the University are essential in bringing students into contact with aspects of professional practice. These are part of the course and must be attended. Cost of transport or excursions is normally paid by students as part of the cost of the course.

Mentoring of Students by Staff
A staff member to whom each student should refer any problem likely to affect their progress has been assigned to each course. Advisers may be changed only by request of the student or the adviser to the Head of School. Any problem concerning a service subject administered by another department should be referred to the Course Co-ordinator.

Official Notices
Official notices will be posted on the notice board near the School Office. Students should view this frequently.

Suggestions for Improvement
Student Liaison Committees are a normal forum for students to express their concerns through student representatives. Complaints and suggestions for improvement may also be made in writing at any time to the Head of School or may be placed in the suggestion box in the library.

Professional Societies
Students are encouraged to join the Institution of Engineers, Australia and, where appropriate, The Australian Institute of Building for a nominal fee. Application forms are available at the School Office.

Student Associations
It is recommended that all students join and actively support the Civil Engineering Students’ Association or Building Engineering Students’ Association, where appropriate.

Bachelor of Engineering in Architectural Engineering

Course Code: EBAE

NOTE: The current course structure is shown below; however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

Course Objectives
The course is designed to develop vocational skills for the engineering planning, design, construction, maintenance and management of building environmental and life safety systems.

The basic objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge capped by specific theoretical and practical exposure to the design of building environmental and life safety systems;
- have the ability to communicate effectively, both orally and in writing, and work well in a team situation;
- have an understanding of community need for building infrastructure in the context of societal aspirations and expectations;
- are motivated to continually improve their knowledge base; and
- are immediately productive upon completion of the course and are thus attractive to prospective employers.

Course Philosophy
The first year of the degree program involves engineering fundamentals to provide a solid foundation for the applied engineering subjects in the following three years of the course. Studies in architecture design practices and architectural history are developed in second year. These fundamentals provide students with the basis of understanding all developments in the profession of Architectural Engineering and Engineering in general as technology continually changes and the profession undergoes continual adjustment.

The applied engineering subjects include an introduction to building structures, building environmental and life safety systems, and building project management. In the final two years of the program, students undertake advanced studies in computer simulation of selected building environmental systems.

An integrated 12 weeks industry placement period will be provided for all students in Architectural Engineering at the end of the third year of the course in a ‘summer semester’ subject. Architectural Engineering graduates will have enhanced skills for careers in:

- advanced environmental services system design;
- building renovation and refurbishment;
- computer aided design and drawing;
- construction planning, management and project supervision;
- cost estimating and project feasibility;
- building energy audits and conservation studies;
- engineering consultation and investigations;
- facilities management and programming;
- interior lighting design;
- risk assessment for building system performance;
- support for preservation Architecture; and
- simulation of building environmental system performance.

Professional Recognition
The Bachelor of Engineering in Architectural Engineering will be submitted for recognition by the Building Practitioners Board and Building Control Commission in Victoria. This submission is to meet the minimum academic qualification for registration as either a Mechanical or Electrical Engineer, as defined by the responsibilities of both categories of Engineer in the relevant Victoria Act.

The degree will satisfy the requirements for accreditation by The Institution of Engineers, Australia and also will satisfy the requirements for accreditation by the Australian Institute of Building, except that a total of 16 weeks of professional experience during the course are required for Corporate Membership of the latter.
USA Exchange Program
A ‘study abroad’ student exchange program is in place with the Department of Architectural Engineering at the University of Kansas (KU) in the USA. Each year, students at third year level will be invited to participate in this program. Travel scholarships may be available to outstanding students.

Admission Requirements and Prerequisites
The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows.

Prerequisites Units 3 and 4
Mathematical Methods, English

Middle Band Selection
Bonuses that previously applied will be handled in the manner described in VTAC’s general statement on middle band selection for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

Admission at Other Levels
Articulation from Associate Diploma or Diploma courses in Building Construction and Design or Engineering. Credit will be given to subjects passed to a sufficient level of competence.

Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language:
- IELTS – an overall band score of 6+, subject to individual profile;
or
- TOEFL – a score of 550+, and a Test of Written English score of 5+.

Course Duration
The course is offered over four years on a full-time basis of 22 contact hours per week. Part-time study may be approved. The course however cannot be completed solely on a part time basis.

Course Structure

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
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<tbody>
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<td>One</td>
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</table>

Year 1
ACE1500 Engineering Communication OR
ACE1510 Engineering Communication for N.N.S.E.
ECG1110 Introduction to Computing
ECM1534Built Environment Engineering
EZD1310 Graphic Communication
EZM1611 Engineering in Society
EZS1210 Solid Mechanics A
EZX1410 Experimental Studies
SMA1201 Mathematics 1AP10
SMA1202 Mathematics 1AQ-
SPH1601 Physics ISA  8

Year 2
ECA2111 Architectural Design 1 8 -
ECK2432 Domestic Construction - 8
ECS2220 Structural Analysis A 8 8
ECS2320 Structural Design A 9 9
EIP2241Power System Fundamentals 2.1 5
EIP2242Power System Fundamentals 2.2 5
EMT2230 Building Thermodynamics 6 6
EZF2250 Building Fluid Mechanics 6 6
EZW2110 Principles of Material Science 8 8
SMA2201 Mathematics B 10 -
SMA2232 Mathematics C - 5
SMA2242 Statistics for Engineers - 5

Year 3
BMO3522 Engineers as Managers - 8
ECA3211 Architectural Engineering Design 1 8 -
ECA3312 Architectural History - 11
ECA3413 Industrial Placement - 8
(Summer Semester)
ECB3460Principles of Air Conditioning 6 -
ECB3470Lighting and Power Distribution 5 -
ECB3480 Hydraulic Services 5 5
ECK3430Building & Project Management 8 -
ECM3531 Construction Management 11 -
ECS3220 Structural Analysis B 8 8
ECS3320 Structural Design B 9 9

Year 4
BMO4551 Human and Industrial Relations 8 -
ECB4350Services Design & Construction 9 -
ECB4381 Fire Services Design 9 -
HKC4430 Commercial Building 10 8
ECK4430 Construction Management 11 -
ECM4532Engineering Project Management 11 -
ECA4211 Architectural Engineering Design 2 8 -
ECA4470 Design Project – Architectural 8 8
ECB4360 Air Conditioning Systems 8 8
ECB4472 Communication Services - 8

Assessment
Assessment in subjects is designed to monitor a student’s progress and achievements as well as contribute to and enhance
their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

**Degree with Honours**

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60% over year levels 1 to 3, have not repeated a subject throughout levels 1 to 3 and have not been granted more than one year completion by compensation throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

**Industrial Experience**

All students will undertake a 12 week (minimum) industry placement program during the third year of their degree. It is intended that this program will meet the industrial experience requirements of the Institution of Engineers, Australia.

**Bachelor of Engineering in Building Engineering**

*Course Code: EBCB*

**NOTE:** The current course structure is shown below, however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

**Course Objectives**

The course is designed to develop vocational skills for the engineering planning, design, construction, maintenance and management of buildings and building services systems.

The basic objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge captured by specific theoretical and practical exposure to either the design of building structures or building services systems;
- have the ability to communicate effectively, both orally in writing, and work well in a team situation;
- have an understanding of community need for building infrastructure in the context of societal aspirations and expectations;
- are motivated to continually improve their knowledge base; and
- are immediately productive upon completion of the course and are thus attractive to prospective employers.

**Course Objectives**

The course recognises societal needs for professional Engineers who have sound technical knowledge and good communication skills who are capable of providing appropriate building infrastructure that is affordable, safe and comfortable to live and work within.

The course is founded on a broad base of science and engineering fundamentals in the first and second year, with emphasis then given in the third and fourth years to applied discipline-specific topics, design and project work. The three main study areas commence in the second year of the course and run for the remainder of the course and are building structures, building services and building construction and management.

Strong emphasis is given to professionalism, ethics and community responsibility. Local examples of building projects provide experiential learning through site visits together with teaching input from practicing Engineers and other professionals in industry. These provide valuable ‘real-world’ case studies and are a motivational asset to the course.

The course utilises a common set of subjects to third year level, then splits into two major streams in final year, these being the ‘structures’ stream and the ‘services’ stream. Both streams retain a common ‘core’ of building construction technology and project management. These ‘majors’ permit students to further their knowledge in a stream and strengthens their value to prospective employers in the building industry.

**Professional Recognition**

The degree satisfies the requirements for accreditation by The Institution of Engineers, Australia and also satisfies the requirements for accreditation by the Australian Institute of Building, except that a total of 16 weeks of professional experience during the course are required for Corporate Membership of the latter.

**USA Exchange Program**

A ‘study abroad’ student exchange program is in place with the Department of Architectural Engineering at the University of Kansas (KU) in the USA. Each year, students at third year level will be invited to participate in this program. Travel scholarships may be available to outstanding students.

**Admission Requirements and Prerequisites**

The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows.

**Prerequisites Units 3 and 4**

Mathematical Methods, English

**Middle Band Selection**

Bonuses that previously applied will be handled in the manner described in VTAC’s general statement on middle band selection for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

**Admission at Other Levels**

Persons transferring from other courses or having overseas or at least equivalent standard to those listed above, should apply for admission in the normal manner.
Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language:

IELTS – an overall band score of 6+, subject to individual profile; or
TOEFL – a score of 550+, and a Test of Written English score of 5+.

Course Duration

The course is offered over four years on a full-time basis. Part-time study may be approved. However, the course cannot be completed solely on a part-time basis. Students must complete 480 credit points.

Course Structure

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
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**Year 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>ACE1500</td>
<td>Engineering Communication, or</td>
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<tr>
<td>ACE1510</td>
<td>Engineering Communication for N.N.S.E.</td>
<td>6</td>
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<tr>
<td>ECC1110</td>
<td>Introduction to Computing</td>
<td>9</td>
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<tr>
<td>ECM1534</td>
<td>Built Environment Engineering</td>
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</tr>
<tr>
<td>EZD1310</td>
<td>Graphic Communication</td>
<td>8</td>
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<tr>
<td>EZM1611</td>
<td>Engineering in Society</td>
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<tr>
<td>EKS1210</td>
<td>Solid Mechanics A</td>
<td>9</td>
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<tr>
<td>EZX1410</td>
<td>Experimental Studies</td>
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<tr>
<td>SMA1201</td>
<td>Mathematics 1AP</td>
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<td>SMA1202</td>
<td>Mathematics 1AQ</td>
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<td>Physics 1SA</td>
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<td>SPM1602</td>
<td>Physics 1SB</td>
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**Year 2**

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<tr>
<td>ECK2432</td>
<td>Domestic Construction</td>
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<tr>
<td>ECS2220</td>
<td>Structural Analysis A</td>
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<td>ECS2320</td>
<td>Structural Design A</td>
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<td>ECT2421</td>
<td>Surveying</td>
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<tr>
<td>EEP2241</td>
<td>Power System Fundamentals 2.1</td>
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<td>EEP2242</td>
<td>Power System Fundamentals 2.2</td>
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<td>EMU2230</td>
<td>Building Thermodynamics</td>
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<td>Building Fluid Mechanics</td>
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<td>EWS2110</td>
<td>Principles of Material Science</td>
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<td>SMA2201</td>
<td>Mathematics B</td>
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<td>SMA2232</td>
<td>Mathematics C3</td>
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<td>SMA2242</td>
<td>Statistics for Engineering</td>
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**Year 3**

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<tbody>
<tr>
<td>BMO3522</td>
<td>Engineers as Managers</td>
<td>8</td>
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<tr>
<td>ECB3460</td>
<td>Principles of Air Conditioning</td>
<td>6</td>
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<td>ECB3470</td>
<td>Lighting and Power Distribution</td>
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<td>ECB3480</td>
<td>Hydraulic Services</td>
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<td>ECG3260</td>
<td>Geomechanics A</td>
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<tr>
<td>ECK3430</td>
<td>Building Construction and Project</td>
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<td>ECM3531</td>
<td>Construction Management</td>
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<td>ECS3220</td>
<td>Structural Analysis B</td>
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<td>ECS3320</td>
<td>Structural Design B</td>
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**Year 4**

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Assessment

Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60% over year levels 1 to 3, have not repeated a subject through levels 1 to 3 and have not been granted more than one year completion by compensation throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience

Candidates applying for the award of a degree in building engineering must ensure that they have submitted for approval evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy the Institution of Engineers, Australia, requirements.

Bachelor of Engineering in Building Surveying

Course Code: EBBS
NOTE: The current course structure is shown below, however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

The Building Surveying degree involves Building Engineering coursework comprising specialised training in building legislation and basic training in structures, services and project management and fire engineering. The degree is an ideal one to combine with a law degree and to gain specialist skills in building law.

Course Objectives
The first part of the degree program involves subjects on engineering fundamentals which provide a solid foundation for the applied engineering subjects given in the later stages of the degree program. Furthermore, the fundamentals provide students with knowledge which will provide the basis of understanding all developments in the profession of Building Surveying Engineering and much engineering in general as technology continually changes and the profession undergoes continual structural adjustment. The applied engineering subjects include construction and legislation, structures, services, management and some studies in building foundations. In the final year of the program, the students undertake studies in performance-based regulations and fire engineering, which affects much of the building regulations.

Graduates will have enhanced skills for a career in Building Surveying. With a little further study the graduates can obtain professional qualifications in Fire Engineering. Graduates are qualified for consulting, construction and project management. Graduates are qualified also to obtain employment in structures, and services.

Admission Requirements and Prerequisites
Prerequisites Units 3 and 4
Mathematical Methods, English

Admission at Other Levels
Articulation from Associate Diploma or Diploma courses in Building Surveying and Engineering. Credit will be given to subjects passed to a sufficient level of competence.

Applications may also be made under the University's alternative categories of entry including continuing difficulties during schooling, Aboriginal and Torres Straight Islanders or mature age (over 21 years of age).

Course Duration
The course is offered over four years on a full-time basis of 22 contact hours per week.

Course Structure

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Building Surveying Stream

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27
EQB5621  Fire Growth Detection and Extinguishment  -  8
EQB5632  Smoke and Fire Spread, Fire Safety System Design  -  8  60  60

Assessment

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Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

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Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy if they have achieved a minimum hour weighted average of 60% over year levels 1 to 3, have not repeated a subject throughout levels 1 to 3 and have not been granted more than one year completion by compensation throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience

All students will undertake a 12 week (minimum) industry placement program during the third year of their degree. It is intended that this program will meet the industrial experience requirements of the Institution of Engineers, Australia.

Professional Recognition

The Bachelor of Engineering in Building Surveying will be accredited by the Australian Institute of Building Surveyors and is recognised by the Building Practitioners Board and Building Control Commission in Victoria as meeting the minimum academic qualification for registration as a Building Surveyor. The degree satisfies the requirements for accreditation by The Institution of Engineers, Australia and by the Australian Institute of Building (AIB), except that a total of 16 weeks of professional experience are required for Corporate Membership of the AIB.

Bachelor of Engineering in Civil Engineering

Course Code: EBCC

NOTE: The current course structure is shown below, however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

Civil Engineering is a broad-based discipline involving the planning, design, construction and management of a wide range of essential community infrastructure including, commercial and industrial buildings, water supply and wastewater systems, irrigation, drainage and flood protection systems, bridges, roads, highways and transportation systems, and port harbour and airport facilities.

The course philosophy is very much based on a recognition of society's need for well-rounded engineers who not only have sound technical and communication skills but also a good understanding of the environmental, economic, social and political environment in which they must operate.

The course is founded on a solid base of science and engineering fundamentals in the first two years, with emphasis then being given in years three and four to applied discipline-specific topics, design and project work. Substantial emphasis is given in a range of subjects to professionalism, ethics and community responsibility, team assignments, broad problem solving and communication skills, and the concepts of sustainability and sustainable engineering practices. A focus on local engineering examples, experiential learning and site visits, together with significant input from external industry-based lecturers, provides students with exposure to real world problems and is considered a motivational cornerstone of the course.

There are two major streams in structural and water engineering running through the course, complemented by minor streams in geomechanics and transportation engineering. Environmental and management issues are covered in specific subjects but also more broadly by integration into a range of other subjects. Subject streams are generally sequential within a well-defined structure. It is envisaged that this structure may be modified somewhat in the future with a view to further motivating students by allowing them a greater degree of flexibility and specialisation, once a firm foundation has been established in the early years of the course. The incorporation of more flexibility should also allow students to remedy any perceived deficiencies in the more basic communication and technical skills.

A study abroad exchange program is in place with the Department of Civil and Environmental Engineering at the University of Kansas (KU) in the USA. Each year, two students at third year level of Civil Engineering (VUT) and Civil Engineering (KU) are invited to participate in this program.

Course Objectives

The course is designed to develop skills for the application of engineering principles of planning, design, construction and management of buildings, roads, water supply and all other major community amenities.

Admission Requirements and Prerequisites

The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows.

Prerequisites Units 3 and 4
Mathematical Units 3 and 4, English, Middle Band selection
Bonuses that previously applied will be handled in the manner described in VTAC’s general statement on middle band selection for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

Admission at Other Levels

Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner. A preliminary interview with the Head of School concerned is advisable for such applicants.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language:
- IELTS – an overall band score of 6+, subject to individual profile, or
- TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

Course Duration

The course is offered over four years on a full-time basis. Part-time study may be approved. However the course cannot be completed solely on a part-time basis. Students must complete 480 credit points.

Course Structure

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<th>Semester</th>
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EGC3260 Geomechanics A8 8
ECM3531 Construction Management 11 -
ECJ3220 Structural Analysis B 8 8
ECS3320 Structural Design B 9 9
ECT3440 Transportation Engineering 8 8

Year 4

BMO4551 Human and Industrial Relations 8
ECD4332 Civil Engineering Design - 8
ECD4400 Civil Engineering Project 10 8
ECF4450 Hydraulic Engineering 8 8
EGC4460 Geomechanics B8 8

Year 4

Year 3

ECT4440 Transportation Engineering 8 8

Assessment

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Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60% over year levels 1 to 3, have not repeated a subject throughout levels 1 to 3 and have not been granted more than one year completion by compensation.
throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

**Industrial Experience**
Candidates applying for the award of a degree in civil engineering must ensure that they have submitted for approval evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy the Institution of Engineers, Australia requirements.

**Professional Recognition**
The Institution of Engineers, Australia has granted full recognition for the Bachelor of Engineering in Civil Engineering. Recognition is a requirement for Graduate Membership of the Institution of Engineers, Australia and additionally for equivalent membership of many overseas professional engineering institutions.

**Bachelor of Engineering in Mechanical Engineering**
*Course Code: EBMIE*

**NOTE:** The current course structure is shown below; however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

The Bachelor of Engineering degree is designed to provide the broad education required for the mechanical engineer's professional career. In addition to the challenging theoretical and practical engineering content, the course contains integrated studies in economics, administration and communication. The degree is suitable for men and women and emphasises achievement across the mechanical engineering disciplines in concert with problem solving, design, engineering applications, innovation, management of resources and professional responsibility.

Mechanical engineers find employment in government institutions and private enterprise in such widespread areas as manufacturing, design of products and machines, automatic control of machines and processes, heating and air conditioning systems, machine and condition monitoring, hydraulic and pneumatic systems, computer applications – including finite element analysis, computer-aided design and engineering and research and development in a wide range of fields.

**Course Objectives**
The course is designed to provide an educational standard and vocational skills which will enable graduates to undertake professional practice in the discipline of Mechanical Engineering. Graduates are provided with a basis to progress through postgraduate studies, continuing education courses and participate in learned society endeavours.

**Admission Requirements and Prerequisites**
The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level and are as follows.

**Prerequisites Units 3 and 4**
Mathematical Methods, English.

**Middle Band Selection**
Bonuses that previously applied will be handled in the manner described in VTAC’s general statement on middle band selection specified for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

**Admission at Other Levels**
Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language:

IELTS – an overall band score of 6+, subject to individual profile; or

TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

**Course Duration**
The course is offered over four years on a full-time basis. The entire course cannot be completed on a part-time basis. Students must complete 480 credit points.

**Course Structure**

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Year 3

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EEH3101  Digital Circuits 3.1  
EMC3111  Engineering Computations C  
EMD3310  Mechanical Design B  
EMF3212  Fluid Mechanics B  
EMS3210  Stress Analysis  
EMT3211  Thermodynamics B  
EMV3210  Dynamics B  
EMD3310  Mechanical Design B  
EMM3412 Measurement and Signal Analysis  

Year 4

BMO4551 Human and Industrial Relations  
BMO3422  Strategic Management  
EMD4320  Mechanical Design C  
EMF4411  Fluid Mechanics C  
EMT4212  Heat Transfer  
EMV4410  Dynamics of Systems  
EMY4410  Project  
EMY4411  Computational Mechanics  
EMY4412  Energy and Environment  

Streams (one only):

EMT4412  Heating and Air Conditioning  
EMT4421  Automotive Engineering  
EMV4410  Vibration and Modal Analysis  
EMU4401  Transportation Dynamics  
EMU4402 Design and Testing of Containers  
EMW4401  Composite Materials  

Normally no more than two streams will be offered in any calendar year.

Assessment

Assessment in subjects is designed to monitor a student’s progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering Program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60% over year levels 1 to 3, have not repeated a subject through levels 1 to 3 and have not been granted more than one stage completion throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience

Candidates applying for the award of a degree in mechanical engineering must ensure that they have submitted for approval evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy the Institution of Engineers, Australia, requirements.

Professional Recognition

The Institution of Engineers, Australia, recognises the degree as meeting all academic requirements for corporate membership as a chartered engineer. Completion of the degree plus 12 weeks approved experience will admit to Graduate Membership. Victoria University students are eligible for Student Membership.

Bachelor of Science in Engineering and Business

Course Code: EBMB

NOTE: The current course structure is shown below, however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

The Bachelor of Science in Engineering and Business is designed to provide a solid grounding in the basic and applied areas of engineering, particularly with regard to industrial and project design and their integration with a range of essential business skills. The course aims to prepare graduates with expertise in specific areas such as Planning and Design, Resource Application and Engineering Management.

The Bachelor of Science in Engineering and Business course aims to provide suitably trained graduates who can have a general impact in the workplace, but particularly in small to medium businesses involved in innovative and entrepreneurial engineering for the expanding Australian and international marketplace.

The course is structured on subjects offered in the Bachelor of Engineering in Mechanical Engineering degree, and the Bachelor of Business degree complemented by subjects in commercial engineering and management. Whilst being a stand-alone qualification, the course will also allow graduates to complete (optional) either the Bachelor of Engineering in Mechanical Engineering degree or the Bachelor of Business degree after approximately two further years of study.
Course Objectives
The objective of the course is to achieve an educational standard which will enable graduates to undertake work involving variety and intellectual challenge requiring accuracy and adherence to prescribed methods of analysis, design and computation in the fields of Planning/Design and Business/Management.

Admission Requirements and Prerequisites
The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level and are as follows:

Prerequisites
Units 3 and 4
English.

Middle Band Selection
Performance in any of the following subjects: Specialist Mathematics, Physics, will be taken into account in the manner described in VTAC's general statement on middle band selection. The student profile, westernality and gender will also be considered.

Admission at Other Levels
Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language:
IELTS – an overall band score of 6+, subject to individual profile;
or
TOEFL – a score of 550+ and a Test of Written English (TWE) score of 5+.

Course Duration
The course is offered over three years on a full-time basis. Part-time study can be approved at any stage of the course. Students must complete 360 credit points.

Course Structure

Year 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester</th>
<th>Credit Points</th>
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<tr>
<td>ACE1500</td>
<td>Engineering Communication</td>
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<td>BCO1101</td>
<td>Computer Applications</td>
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<tr>
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<td>Management and Organisational</td>
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<tr>
<td>ESS1210</td>
<td>Solid Mechanics</td>
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<td>ESSX1410</td>
<td>Experimental Studies</td>
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Year 2

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<td>EMC2112</td>
<td>Engineering Computations A</td>
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<td>EMD2310</td>
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and other:

Engineering Management Stream

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<td>BMO3522</td>
<td>Engineers as Managers</td>
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Business Stream

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<th>Course Title</th>
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<td>Business Law</td>
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Assessment

Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of Department in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.
Professional Recognition
The course satisfies the requirements for accreditation as an Affiliate of the Institution of Engineers, Australia.

Articulation Pathways
Students who have completed the Bachelor of Science in Engineering and Business degree may apply for admission into either the Bachelor of Engineering in Mechanical Engineering degree or the Bachelor of Business degree at an advanced level. The level of entry into these degree programs will depend on the elective subjects passed during the Bachelor of Applied in Engineering and Business degree. In most cases however, the second degree can be completed after approximately two further years of full-time study (or equivalent).

Special provision is made for admission into degree courses on the basis of a completed Associate Diploma in the appropriate field and a high performance in approved subjects. Interested persons should refer to the section on Articulation and Credit Transfer in this Handbook.

Bachelor of Science in Environmental Engineering

Course Code: EBEV

NOTE: The current course structure is shown below, however, this course is currently under review and it is anticipated that there will be changes to the structure of the course which are envisaged to be implemented in 2002.

Course Description
This three-year degree program provides a basic qualification and employment opportunities in areas related to infrastructure provision and sustainable urban and rural development. Major subject areas covered include environmental and engineering sciences, mathematics and computing, environmental engineering and design, land and water management, energy studies, urban planning and development, and several aspects of management including human resources, legislation and economics. The first two years of the course largely focus on mathematics, basic sciences and the development of communication skills. Third year subjects are concerned with the application of all of these skills to the planning, design, maintenance and management of infrastructure and other development with the object of helping to achieve both local and global sustainability.

Course Objectives
The course is designed to produce graduates with:
• Well developed technical, communication and teamwork skills.
• The ability to work independently or with people from a wide variety of disciplines.
• The ability to apply scientific and engineering principles in an integrated manner to the solution of a range of development and environmental problems in order to improve our total life quality and global sustainability.

Admission Requirements and Prerequisites
The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows:

Prerequisites Units 3 and 4
English and a study score of at least 20 in mathematics (any).

Middle Band selection
Applicants in the middle band will be considered on the basis of the full range of their year 12 studies, with particular attention to results in prerequisites and other science-based studies.

Admission at Other Levels
Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS – an overall band score of 6+, subject to individual profile, or TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

Course Duration
The course is offered over three years on a full-time basis. Part-time study can be approved at any stage of the course. Students must complete 360 credit points.

Course Structure

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<thead>
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<td>ECC1110</td>
<td>Introduction to Computing</td>
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<td>Sustainable Development</td>
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<td>ECG2260</td>
<td>Earth Science</td>
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<td>Environmental Legislation and Economics</td>
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<td>SME3340</td>
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</tbody>
</table>

33
Assessment

Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

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School of Communications and Informatics

Undergraduate Studies
The School of Communications and Informatics offers undergraduate courses leading to the award of:

- Bachelor of Engineering in:
  - Computer Engineering
  - Electrical and Electronic Engineering
  - Multimedia Telecommunications Engineering

- Bachelor of Science in:
  - Applied Physics and Computing
  - Computer Science
  - Computer Science and Aviation
  - Computer and Mathematical Sciences
  - Computer Technology
  - Mathematical Sciences
  - Optoelectronics

The School of Communications and Informatics offers a comprehensive portfolio of undergraduate, postgraduate and research study programs in the fields of applied physics, computer science, electrical and electronic engineering and mathematical science. All courses are designed to have a strong practical bias and include a significant amount of 'hands-on' project work component. They are taught in laboratories with modern equipment and computing facilities. As a result, our graduates are highly regarded and sought after by industry.

Details of the School's research activities and postgraduate degree programs are described in the Postgraduate Studies section of the Handbook.

The School has a large enrolment of both local and international students. Some programs are offered offshore in Hong Kong and other parts of Asia.

The Bachelor of Science awards have a large degree of commonality of subjects in first year which facilitates possible transfer between courses. The Engineering awards have a great deal of commonality of subjects in their first two years.

The Bachelor of Science courses are of 3 years duration and the Bachelor of Engineering courses 4 years.

Computer Facilities
The School has a number of computing laboratories for teaching and research. These laboratories are equipped with the latest equipment such as Pentium PCs, Unix workstations, and high speed line printers and laser printers. Graphical user interfaces and menu-driven interfaces are provided for easy access to services. Recent acquisitions include multimedia facilities

Articulation Pathways
Holders of a TAFE Associate Diploma in Electronics (with appropriate mathematics and results at Distinction level) may be admitted into Year One of the School's undergraduate courses. If the TAFE Associate Diploma has been completed at High Distinction level, advanced admission to Year Two may be considered.

Special advanced admission provisions apply to certain overseas Diploma and Higher Diploma qualifications.

School Course Information

Assessment
Assessment in subjects is designed to monitor a student's progress and achievement as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Professional Recognition
The Institution of Engineers, Australia, recognises the Electrical and Electronic Engineering, Multimedia Telecommunications and Computer Engineering degrees as meeting all academic requirements for corporate membership as a Chartered Engineer, Australia. Completion of any of these degrees, including 12 weeks approved experience, will admit to graduate membership.

The Institution of Radio and Electronics Engineers, Australia, recognises the Electrical and Electronic Engineering degree as meeting all academic requirements for corporate membership as a Chartered Electronic Engineer. The Australian Computer Society recognises the Electrical and Electronic Engineering degree for professional membership.

Overseas professional institutions such as the British Computer Society, the Institution of Electrical Engineers (UK), the Institution of Electrical and Electronic Engineers (USA), and the Institution of Engineers, Malaysia, in general provide similar recognition.

Graduates who major in computer science are eligible to become associate members of the Australian Computer Society after one year.

Graduates of the Applied Physics and Computing degree are recognised by both the Australian Computer Society and the Australian Institute of Physics. Optoelectronics graduates are recognised by the Australian Institute of Physics.
Bachelor of Engineering in Computer Engineering

Course Code: EBEH

The major role of professional engineers in the Australian workforce is to act as agents for change through the development of technically sound, economically viable, and socially acceptable solutions to complex and new technical problems.

The rapid advances in computer applications and technology, particularly in the communication, control and multimedia areas, mean that many commercial and industrial problems are of a multidisciplinary nature, requiring expertise in both computer systems and electrical and electronic engineering. The aim of this course is to combine the desirable features of computer and electronic engineering with computer systems. The computer systems engineer will be technically competent in computer programming, computer communication, networking, embedded system development, advanced computer systems engineering including both software and hardware design.

Course Objectives

This course is to provide a specialised program to adequately prepare graduates for computer engineering positions. The general aims of the course are to provide graduates with basic knowledge and technical skills in the areas of mathematics, electronics, digital systems, and computer programming; a selection of commonly used computer languages and packages in the development of software for real time, embedded, and scientific applications; specific knowledge and technical skills pertinent to the development of computer engineering systems; management skills in relation to human and industrial relations, strategic management, role of engineer as a manager and financial and resource management; develop attitudes of personal initiative and enquiry in students so that they may continue to further education and meet the technological changes in their profession; develop oral and written communication skills, an understanding of society and the computer system engineer's role in society; professional awareness, including social and legal responsibilities, ethics, and membership of a professional society.

Admission Requirements

Admission to the course will be governed by the University Regulations for undergraduate courses as set out in the Faculty of Engineering and Science Handbook in either of the categories of Normal Entry or Alternative Category Entry.

The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows.

Prerequisites Units 3 and 4
Mathematical Methods, English

Middle Band Selection

Applicants in the middle band will be considered on the basis of the full range of their VCE studies and results with particular attention to results in prerequisite studies and other science based studies.

Admission at Other Levels

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language:

IELTS – an overall band score of 6+, subject to individual profile; or
TOEFL – a score of 550+, and a test of written English (TWE) score of 5+.

Course Duration

The course is offered over four years on a full-time basis. Part-time study can be approved at any stage of the course although the entire course cannot be completed on a part-time basis.

Course Structure

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<th>Credit points</th>
<th>Semester</th>
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EET2502 Computer Communication 2.2 - 8
Electives (three for semester 1 and two for semester 2):
EEA2002 Circuits and Control 2.2 - 8
EEA4004 Robotics and Automation 4.1 - 8
EEC3801 Data Based Systems - 8
EEC3802 Artificial Intelligence 3.2 - 8
EEC3804 Computer Graphics 3.2 - 8
EET2001 Multimedia Program Production 2.1 - 8
EET2101 Multimedia Techniques 2.1 - 8

Appropriate semester electives from other Degree courses 60

Year 4
BMO4551 Human and Industrial Relations 8 - 8
BMO3422 Strategic Management - 8
EED4000 Design 4.0 20
EEH4101 Computer and Digital Design 4.1 - 8
EEH4102 Computer and Digital Design 4.2 - 8
EEY4102 Computer Systems 4.2 - 8
EEY4103 Computer Systems 4.3 - 8
Electives (two for semester 1 and two for semester 2):
EEC3504 Computers in Society 3.2 - 8
EEH3201 Computer and Digital Design 3.1 - 8
EEL401 Neural Network and Fuzzy Logic 4.1 - 8
EET3501 Computer Communication 3.1 - 8
EET3502 Computer Communication 3.2 - 8
SCM3314 Object Oriented Analysis and Design 8 - 8

Appropriate semester electives from other degree courses 60

To be approved by the Year Co-ordinator

Students will be required to submit evidence of having completed a minimum of 12 weeks industrial experience relevant to the course to satisfy the Institution of Engineers (Australia) requirements.

Assessment
The assessment for each subject is detailed in the subject listings.

Course Regulations
Are given following the Bachelor of Engineering in Multimedia Telecommunications.

Professional Recognition
The Institution of Engineers, Australia recognises the Electrical and Electronic Engineering degree as meeting all academic requirements for corporate membership as a Chartered Engineer, Australia. Completion of this degree, including 12 weeks approved experience, will admit to graduate membership. The Bachelor of Engineering – Computer Engineering is expected to meet the requirements for membership of the Institution of Engineers, Australia. Accreditation has been sought in 1998.

The Institution of Radio and Electronics Engineers, Australia, recognises the Electrical and Electronic Engineering degree as meeting all academic requirements for corporate membership as a Chartered Electronic Engineer. The Australian Computer Society recognises the Electrical and Electronic Engineering degree for professional membership.

Overseas professional institutions such as the British Computer Society, the Institution of Electrical Engineers (UK), the Institution of Electrical and Electronic Engineers (USA), and the Institution of Engineers, Malaysia, in general provide similar recognition.

Bachelor of Engineering in Electrical and Electronic Engineering
Course Code: EBEE

The Bachelor of Engineering in Electrical and Electronic Engineering degree course provides an extensive core of studies in the major electrical engineering fields of electronics, communications, computer systems, software engineering, power engineering and control engineering. Outstanding graduates may be awarded the degree of Bachelor of Engineering with honours.

The 8th year course is designed to provide both the breadth and specialisation appropriate to the electrical and electronic engineer's professional career in Australia and overseas. The first two years of the course develop the basic concepts in electrical and electronic engineering, digital electronics and computer systems and programming, together with related engineering, applied science studies and practical application in projects and laboratory.

In third and fourth years the core areas are developed in depth. Students also choose electives in fourth year in those electrical, electronic, or computer systems engineering areas in which they have special interest. Again the advanced students are involved in 'real world' electrical engineering through circuit and system projects that are often part of actual staff or industry projects.

The four-year course leading to the award of your degree, will require your full effort but the reward of success will be in your career and salary prospects, your status in the community, and the opportunity for achievement in an interesting and challenging profession.

Course Objectives
The main objectives of the course are to provide an integrated foundation for electrical disciplinary studies and course specialisation into the particular areas of communication, computer, control, electronic and power engineering; develop attitudes of personal initiative and enquiry in students that may continue to further education and meet the technological changes in their profession; develop oral and written communications and an understanding of society and the engineer's role in society; provide for professional recognition by the Institution of Engineers, Australia and other professional bodies.
Admission Requirements
The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows.

Prerequisites Units 3 and 4
Mathematical Methods, English

Middle Band Selection
Bonuses that previously applied will be handled in the manner described in VTAC’s general statement on middle band selection for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

Admission at Other Levels
Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS – score of 6+, subject to individual profile; or TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

Course Duration
The course is offered over four years on a full-time basis. Part-time study can be approved at any stage of the course although the entire course cannot be completed on a part-time basis.

Course Structure

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<tr>
<th>Credit points</th>
<th>Year</th>
<th>Semester</th>
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<th>Group B (Electives (any two electives))</th>
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</table>
Degree with Honours
A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy if they have achieved a minimum hour weighted average of 60% over year levels 1 to 3, have not repeated a subject through levels 1 to 3 and have not been granted more than one stage completion throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience
Candidates applying for the award of a degree in electrical and electronic engineering and computer engineering must ensure that they have submitted for approval evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy the Institution of Engineers, Australia, requirements.

Assessment
The assessment for each subject is detailed in the subject listings.

Course Regulations
Are given following the Bachelor of Engineering in Multimedia Telecommunications.

Bachelor of Engineering in Multimedia Telecommunications

Course Code: EBET

The Bachelor of Engineering in Multimedia Telecommunications is an engineering degree course that provides an extensive core of studies in the major Multimedia Telecommunications fields of electronics, communications, satellite communications, fibre optic technology, audio/video production and multimedia techniques. Outstanding graduates may be awarded the degree of Bachelor of Engineering with Honours.

The degree course is designed to provide both the breadth and specialisation appropriate to multimedia communication careers in Australia and overseas.

The first one and a half years of the course develop the basic concepts in electronic engineering, digital electronics and computer systems and programming, together with related engineering science studies.

In the third and fourth years the core areas are developed in depth. Students also choose electives in those multimedia communication subjects in which they have special interests.

The four year course leading to the award of a degree, will require full effort but the reward of success will be in the chosen career and salary prospects and the opportunity for achievement in an interesting and challenging profession.

Course Objectives
The main objectives of the course are to: provide an integrated foundation for electrical disciplinary studies and course specialisation into the particular areas of multimedia telecommunications and computer technologies; develop attitudes of personal initiative and enquiry in students that may continue to further education and meet the technological changes in their profession; develop oral and written communications and an understanding of society and the engineer's role in society; provide for professional recognition by the Institution of Engineers, Australia and other professional bodies.

Admission Requirements
The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows:

Prerequisites Units 3 & 4
Mathematical Methods, English

Middle Band Selection
Bonuses that previously applied will be handled in the manner described in VTAC’s general statement on middle band selection for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

Admission at Other Levels
Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS – an overall band score of 6+, subject to individual profile; or TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

Course Duration
The course is offered over four years on a full-time basis. Part-time study can be approved at any stage of the course although the entire course cannot be completed on a part-time basis.

Course Structure

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**Electives (any two electives)**

- SMA2201 Mathematics B 10
- SMA2212 Mathematics C1
- SMA2242 Statistics for Engineers

## Year 3

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**Electives (any four of the following)**

- EEH3002 Multimedia Circuits and Systems 3.2
- EET3002 Multimedia Communication Network 3.2
- EET3500 Computer Communication 3.1
- EET3502 Computer Communication 3.2
- SPH4531 Fibre Optic Technology Fundamentals

## Year 4

**Core**

- BMO4551 Human & Industrial Relations 8
- BMO3422 Strategic Management 8
- EED4000 Design & Project 8

**Electives**

- EET4001 Signal Processing 4.1 8
- EET4002 Signal Processing 4.2 8
- EET4701 Communication Systems 4.1 8
- EET4702 Communication Systems 4.2 8
- EEE4101 Computer Systems 4.1 8
- EEE4102 Computer Systems 4.2 8

## Electives (any two electives)

- EET4104 Satellite Communication 4.1 8
- EEE4404 Microwave Electronics 4.2 8
- EET4302 Multimedia Systems Design 4.2 -
- EET4401 Mobile Communication Systems 4.1 8
- EET4402 Teletraffic Engineering 4.2 8
- EEY4501 Broadband ISDN 4.1 8
- EEY4002 Multimedia Network Management 4.2 8
- BMO4422 Strategic Management 8
- BMO4322 Human & Industrial Relations 8
- BMO4322 Strategic Management 8
- EED4000 Design & Project 8

**Assessment**

The assessment for each subject is detailed in the subject listings.

## Course Regulations

**Progression and Exclusion**

Each Engineering undergraduate course is specified as a unique set of course subjects. The sequence in which these course subjects is normally studied is specified, firstly, by grouping them in course years and secondly, by specifying prerequisites and/or co-requisites for some subjects.

Normally, all of the course subjects in a particular course year should be completed and all prerequisite/co-requisite requirements satisfied before enrolment will be permitted in any subject in a subsequent course year. Enrolment in subjects spanning more than two course years is not permitted.

In order to satisfy the academic requirements for a course award, all course subjects must be completed. Such completion may be obtained by:

(a) being granted exemption in either individual subjects or in course years; and/or
(b) achieving a grade of P (or higher) in the assessment of each subject; and/or
(c) being granted compensation in course years.

A stage grading of ‘Year Completed by Compensation’ may be granted if a student:

(i) has been given final grades in all subjects in the course year; and
(ii) has passed subjects equivalent to more than 80% of total required semester hours for that course year with no assessment at less than N1 grade; and
(iii) has achieved an hour-weighted average mark of at least 50% for all subjects in the year.

A grading of ‘Year Completed by Compensation’ recognises an acceptable overall result but does not constitute a pass in any individual failed subject.
Students who do not satisfy the requirements for a 'Year Completed by Compensation' must repeat all failed subjects of that year (or their equivalents) at the earliest opportunity.

Normally, gradings of 'Year Completed by Compensation' will not be granted in consecutive years of a course.

Normal progress through a course requires a student to complete any defined course year within one year of equivalent full-time enrolment.

Any of the following may be considered to constitute unsatisfactory progress by a student:

(i) failure in any subject or unit for the third time;
(ii) failure in any subject or unit at N2 level for the second time;
(iii) failure in 50% or more of their assessed enrolment load in any semester or calendar year of study;
(iv) failure to complete any two consecutive course years within three years of equivalent full-time enrolment;
(v) failure to complete the course within the maximum period defined by University Statute;
(vi) failure to meet a conditional enrolment agreement.

As otherwise defined by University Statute and subject to being invited to show cause, a student making unsatisfactory progress will normally be recommended for exclusion from the course.

Bachelor of Science in Applied Physics and Computing

Course Code: SBPC

Course Objectives

The broad aim of this three-year full-time course is to produce professionally qualified graduates with a strong background in both physics and computing. This can be complemented by a knowledge of selected areas. By selecting Business subjects graduates are prepared for careers involving applied physics and/or computing; with the opportunity to be equipped with introductory business and management skills in recognition of the importance of these in many technical positions.

The physics component of the course emphasises, particularly in the third year, the technologically important areas of Modern Optics (including Fibre Optics, Laser Physics and Photonics). The lecture material in these and other areas is supported by extensive laboratory programs. The physics component of the course is supported by the inclusion of relevant mathematics subjects.

The computing component of the course deals with both software and hardware aspects. Thus graduates are trained in such areas as computer and microprocessor architecture, data acquisition, instrument control, databases, computer graphics and programming in a variety of languages, including commercial and scientific applications.

Students choose four elective subjects enabling them to broaden their degree or specialise further in either Physics or Computing.

Admission Requirements

The entry requirement is normally a successful completion of the VCE (or an equivalent course of study) with passes in Mathematics and English. In accordance with the VTAC selection scheme, the VCE prerequisites are – Units 3 and 4: English and Mathematical Methods or Specialist Mathematics. For students in the middle-band, preference will be given to those with Physics or Specialist Mathematics (see the general statement on middle-band selection as it appears in the VTAC Guide to University and TAFE Courses). For such students, consideration will also be given to the full range of an applicant's VCE studies and results, to the level of performance in CATs, and to the student profile.

Applicants who do not satisfy the above requirements, should contact the Selection Officer. Equivalent subjects and experience will be considered.

Course Duration

The course is offered on a full-time basis over three years.

Course Structure

(Revised course introduced in 1997)

Subjects are taken over six semesters (three years).

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<td>25</td>
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<tr>
<td>Subjects from List A</td>
<td>10 or 20</td>
<td>20 or 30</td>
<td></td>
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<tr>
<td>SMA3311</td>
<td>Mathematics 3P</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SPH3941</td>
<td>Computational Physics A</td>
<td>10</td>
<td></td>
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<tr>
<td>SPH3942</td>
<td>Computational Physics B</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Subjects from List A</td>
<td>10 or 20</td>
<td>20 or 30</td>
<td></td>
</tr>
</tbody>
</table>

List A

The subjects listed here (total 80 credit points) are undertaken in Years 2 and 3.

| SCM2111 | Data Communications and Networks 1 | 10 |
| SCM2211 | Database Systems 1 | 10 |
| SCM2312 | Software Engineering 1 | 10 |
Elective Subjects

The 40 elective points allow students to choose subjects from any area, either to broaden their degree or for greater specialisation in Physics or Computing. Students have the choice of taking all their subjects from one area or from a range of areas. By undertaking four subjects from one area, other than physics or computing, students could obtain a minor in that area, e.g. Business. Some possibilities are listed below.

Physics Options
SPH3430 Physics Project 10 credit points
SPH1111 Astronomy 10 credit points

Students may undertake subjects from the BSc (Optoelectronics) degree, for example, SPH3441 Optical Properties of Materials, SPH3451 Advanced Optics and Optical Design, and SPH3462 Optical Waveguides and Sensors (5 credit points each).

Computing Options
A broad range of subjects from the courses run by the School may be undertaken, as listed in this Handbook. These subjects are mostly 10 credit points each.

Business Options
It is possible for students to complete a minor in any of the areas of marketing, economics, business law, administrative studies or accounting by choosing a four-subject sequence in these areas. Students will be given guidance about subject selections. Suggested subject sequences in the various business areas are listed below. In some cases other options exist. Students intending to complete a minor should consult with the appropriate business department at an early stage to discuss their choice of subjects.

A description of these subjects (10 credit points each) is found in the Faculty of Business and Law Handbook.

Marketing
Two-subject sequence:
BHO2231 Marketing 1
BHA3432 Marketing 2
Additional two subjects to complete minor:
BEO1106 Business Statistics
BHA3434 Consumer Behaviour

Economics
Two-subject sequence:
BEO1103 Microeconomic Principles
BEO1104 Macroeconomic Principles
Additional two subjects to complete minor to be selected in consultation with the Department of Applied Economics

Business Law
Two-subject sequence:
BLO1105 Business Law
BLO2300 Commercial Law
Additional two subjects to complete minor:
BLO2205 Corporate Law
BLO2206 Taxation Law and Practice

Bachelor of Science in Computer Science
Course Code: SBCO
(Under Modification)

Bachelor of Science in Computer and Mathematical Sciences
Course Code: SBCM
(Under Modification)

Bachelor of Science in Mathematical Sciences
Course Code: SBMS
(Under Modification)

Course Objectives
The three programs all aim to provide graduates with the analytical ability, factual knowledge and communication skills that will suit them for employment in business and industry in one or more of the following areas:

- computing: programming, software development, systems design and analysis, applications development, technical support.
- statistics: data analysis, quality improvement, market research, forecasting, econometrics.
- operations research: production planning and scheduling, simulation studies, transportation planning, resource allocation.
- financial modelling: investment analysis, project evaluation.
- secondary teaching: mathematics, computer science.

One of the most significant features of the courses is the attempt to involve students in the solution of real world problems. Naturally, problem-solving is a large component of all the subjects taught in the course but, starting in the first year, special emphasis is placed on problem formulation and report writing.
All students undertake at least one industry project in the third year of the course. These projects tend to be related to problems encountered in specific areas of the manufacturing industry, banking or finance, government statutory authorities, or services such as hospitals and local councils.

As evidenced by the high rate of job placement in the areas listed above, graduates have been well-received in industry, commerce and government.

**Admission Requirements**

To qualify for admission to the course an applicant should have successfully completed Year 12 of the Victorian Certificate of Education (VCE), with results of a grade D or better in both English and Mathematical Methods, or have the equivalent of these qualifications.

Alternatively, entry is via TAFE articulation or under mature age provisions.

**Course Duration**

The courses are offered on a full-time basis over three years. In addition, there is an evening program being offered for part-time students. Summer evening subjects are also offered to assist these students to complete their studies.

**Course Structure**

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Credit Points</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English Language and Communication 1</td>
<td>10</td>
<td>SCM1111, SCM1112, SCM1113, SCM1311, SCM1312, SCM1611, SCM1612, SCM1711, SCM1712</td>
</tr>
<tr>
<td></td>
<td>Electronics 1A (elective)</td>
<td>10</td>
<td>SCM2111, SCM2112, SCM2113, SCM2114, SCM2115, SCM2116, SCM2117, SCM2118</td>
</tr>
<tr>
<td></td>
<td>Introduction to Computer Systems 1</td>
<td>10</td>
<td>SCM2411, SCM2412, SCM2413, SCM2414, SCM2415, SCM2416, SCM2417, SCM2418</td>
</tr>
<tr>
<td></td>
<td>Introduction to Computer Systems 2</td>
<td>10</td>
<td>SCM2511, SCM2512, SCM2513, SCM2514, SCM2515, SCM2516, SCM2517, SCM2518</td>
</tr>
<tr>
<td></td>
<td>Computer Organisation and Architecture</td>
<td>10</td>
<td>SCM2611, SCM2612, SCM2613, SCM2614, SCM2615, SCM2616, SCM2617, SCM2618</td>
</tr>
<tr>
<td></td>
<td>Programming 115</td>
<td>10</td>
<td>SCM2711, SCM2712, SCM2713, SCM2714, SCM2715, SCM2716, SCM2717, SCM2718</td>
</tr>
<tr>
<td></td>
<td>Applied Statistics 1</td>
<td>10</td>
<td>SCM2811, SCM2812, SCM2813, SCM2814, SCM2815, SCM2816, SCM2817, SCM2818</td>
</tr>
<tr>
<td></td>
<td>Applied Statistics 2</td>
<td>10</td>
<td>SCM2911, SCM2912, SCM2913, SCM2914, SCM2915, SCM2916, SCM2917, SCM2918</td>
</tr>
<tr>
<td></td>
<td>Mathematical Foundations 1</td>
<td>10</td>
<td>SCM3011, SCM3012, SCM3013, SCM3014, SCM3015, SCM3016, SCM3017, SCM3018</td>
</tr>
<tr>
<td></td>
<td>Mathematical Foundations 2</td>
<td>10</td>
<td>SCM3111, SCM3112, SCM3113, SCM3114, SCM3115, SCM3116, SCM3117, SCM3118</td>
</tr>
<tr>
<td>Year 2</td>
<td>Six Electives (6 x 3 hours)</td>
<td>60</td>
<td>SCM3211, SCM3212, SCM3213, SCM3214, SCM3215, SCM3216</td>
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<tr>
<td></td>
<td>Six Electives (6 x 3 hours)</td>
<td>60</td>
<td>SCM3311, SCM3312, SCM3313, SCM3314, SCM3315, SCM3316</td>
</tr>
<tr>
<td>Year 3</td>
<td>English Language and Communication 3</td>
<td>10</td>
<td>SCM3411, SCM3412, SCM3413, SCM3414, SCM3415, SCM3416</td>
</tr>
<tr>
<td></td>
<td>English Language and Communication 4</td>
<td>10</td>
<td>SCM3511, SCM3512, SCM3513, SCM3514, SCM3515, SCM3516</td>
</tr>
</tbody>
</table>

*An enabling subject for those students identified as requiring assistance in English. These students will do two hours per week in excess of a full course load in first year, but will be permitted to count English Language and Communication 1 and 2 as a single second year elective subject or in lieu of the first year elective.

The following is a list of the second and third year elective subjects, some of which will be available each year:

**Computer Science**

- SCM2111 Data Communications and Networks 1*
- SCM2112 Operating Systems
- SCM2211 Database Systems 1*
- SCM2218 Database Systems 2*
- SCM2311 Object Oriented Programming 1*
- SCM2312 Software Engineering 1*
- SCM2313 Software Development*
- SCM2314 Cobol Programming
- SCM3111 Data Communications and Networks 2
- SCM3112 User Interface Design*
- SCM3113 Multimedia Systems Design
- SCM3114 Parallel Processing(#)
- SCM3211 Database Systems 3*
- SCM3212 Information Systems*
- SCM3311 Object Oriented Programming 2*
- SCM3312 Intelligent Systems(#)
- SCM3313 Software Engineering 2*
- SCM3314 Object Oriented Analysis and Design*

**Mathematical Sciences**

- SCM2411 Mathematical Economics 1*
- SCM2412 Mathematical Economics 2
- SCM2511 Image Processing
- SCM2611 Linear Statistical Models*
- SCM2612 Statistical Forecasting
- SCM2613 Sampling and Data Analysis*
- SCM2711 Discrete Mathematics
- SCM2712 Analysis of Continuous Processes
- SCM2911 Linear Programming*
- SCM2912 Production Scheduling*
- SCM2913 Optimisation Methods 1*
- SCM2914 Problem Solving
- SCM3111 Image Processing 2
- SCM3112 Mathematical Techniques in Image Processing
- SCM3411 Financial Modelling*
- SCM3412 Econometrics
- SCM3511 Mathematical Economics 3
- SCM3512 Regression Analysis*
- SCM3513 Mathematical Techniques in Image Processing
- SCM3611 Regression Analysis*
- SCM3612 Statistical Methods for Managing Industrial Processes 1
- SCM3613 Time Series Analysis
SCM3614  Experimental Design 1*  
SCM3615  Multivariate Statistics 1  
SCM3616  System Reliability and Maintenance  
SCM3711  Computational Algorithms  
SCM3712  Coding, Cryptography and Computer Security  
SCM3713  Discrete Mathematical Modelling  
SCM3911  Simulation*  
SCM3912  Optimisation Methods 2

* To be offered each year  
# To be offered alternate years

To qualify for the Bachelor of Science in Computer Science at least twelve clear passes in Computer Science electives plus eight other approved electives must be obtained. To qualify for the Bachelor of Science in Mathematical Sciences at least twelve clear passes plus eight other approved electives in Mathematical Sciences electives must be obtained. Any other combination of electives satisfying the award criteria will lead to the Bachelor of Science in Computer and Mathematical Sciences.

Assessment

Assessment for each subject is detailed in the subject listings.

Course Regulations

Progress Regulations

The Academic Progress Committee Board of Examiners' Meeting will, at the end of each semester consider the results and progress of all students enrolled in the courses.

Progression through each course is based on the following guidelines:

(i) Where any compulsory subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure;
(ii) Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the prerequisite subjects;
(iii) Student enrolment will not normally be approved where the total proposed subject hours exceeds the normal semester load.

Completion by Compensation

Completion by compensation will be granted under the following conditions:

(i) Completion by compensation applies only to the elective subjects with the exception that a maximum of one of the compulsory first year subjects other than English Language and Communication 1 or 2 may be completed by compensation;
(ii) If for a maximum of three subjects, at most one being a first year subject (other than English Language and Communication 1 or 2) and the other electives, a student has an N1 grade, that student may be granted the award where those subjects carrying the N1 grade are deemed completed by compensation;
(iii) The N1 grades in (ii) must be obtained in at most two sittings;
(iv) Completion by compensation is not a pass in a failed subject.

Unsatisfactory Progress

These regulations should be read in conjunction with the Victoria University Statute 6.4.1 – Unsatisfactory Progress.

(a) The following shall constitute unsatisfactory progress:

- failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study;
- failure in any subject twice;
- transgression of a conditional enrolment stipulation and agreement.

(b) Where a student's progress is unsatisfactory, the section Academic Progress Committee may recommend the following:

- a restricted and conditional enrolment only be approved;
- exclusion from the course.

(c) A student who wishes to appeal against the section's written recommendation is required to do so in accordance with the University Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University Statutes.

(d) Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of the exclusion. Students must provide, with their application, evidence of changed circumstances which significantly improve the applicant's likelihood of academic success.

Bachelor of Computer Science and Aviation

Course Code: SBCA

Course Objectives

The Bachelor of Science in Computer Science and Aviation aims to provide participants with:

- a practical and applied approach to the concepts of computer science and aviation;
- a range of skills in computer science, the mathematical sciences and aeronautical theory subjects at a level sufficient to satisfy the requirements for the issue of a Commercial Pilot's Licence (CPL), and Instrument Rating.

The specific aims of the course are to provide students with the opportunity to:

- obtain level two accreditation from the Australian Computer Society (ACS) by passing all compulsory computer science subjects, and thus gaining professional recognition;
- develop skills and competence in aviation theory. The course is structured so that students can integrate practical flying training along with their academic studies and if choosing to do so and following the guidelines given, will complete the degree at the same time as qualifying for the issue of a Commercial Pilot's Licence (CPL) and Command Instrument Rating.

Course Duration

The course is offered over three years full-time and part-time equivalent.

Admission Requirements

Ordinary Admission Requirements

To qualify for admission to the course an applicant must have successfully completed year twelve of the Victorian Certificate of Education (VCE), with results of a grade D or better in both English and Mathematical Methods, or have the equivalent of these qualifications. Alternatively, entry is via TAFE articulation or under mature age provisions. In addition, students must pass
the prescribed medical examination conducted by a Civil Aviation Safety Authority-Approved Aviation Medical Examiner in order to be permitted to commence flying training.

Applicants may be interviewed. Consideration by a Faculty panel may be given to relevant work experience, and any other activities undertaken demonstrating ability to achieve in this course.

**Advanced Standing**

Applicants entering with a Private Pilot’s Licence and more than 200 hours flying experience, or a Commercial Pilot’s Licence will be given full credit for the aviation subjects and can join the course with advanced standing provided they meet the admission requirements. The course provides existing pilots the opportunity to upgrade their non-flying skills as well as providing them with a degree qualification which is likely to be necessary if they are to further their career in the aviation industry.

**Course Structure**

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Year 1</th>
<th>Semester</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>One</td>
<td>Two</td>
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<tr>
<td>*ACE1411</td>
<td>English Language and Communication 1 * -</td>
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</tr>
<tr>
<td>*ACE1412</td>
<td>English Language and Communication 2 - *</td>
<td></td>
</tr>
<tr>
<td>SCA1100</td>
<td>Introductory Aeronautics</td>
<td></td>
</tr>
<tr>
<td>SCA2100 Radio</td>
<td>Basic Aeronautics</td>
<td></td>
</tr>
<tr>
<td>SCA2101</td>
<td>(Area Solo/BAK)</td>
<td>3</td>
</tr>
<tr>
<td>SCA1111</td>
<td>Introduction to Computer Systems 1</td>
<td>10</td>
</tr>
<tr>
<td>SCA1112</td>
<td>Introduction to Computer Systems 2</td>
<td>10</td>
</tr>
<tr>
<td>SCA1113</td>
<td>Computer Organisation and Architecture</td>
<td>10</td>
</tr>
<tr>
<td>SCM1311</td>
<td>Programming 110</td>
<td></td>
</tr>
<tr>
<td>SCM1312</td>
<td>Programming 2 -</td>
<td></td>
</tr>
<tr>
<td>SCM1611</td>
<td>Applied Statistics 1</td>
<td></td>
</tr>
<tr>
<td>SCM1711</td>
<td>Mathematical Foundations 1</td>
<td></td>
</tr>
<tr>
<td>SCM1712</td>
<td>Mathematical Foundations 2</td>
<td></td>
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<tr>
<td>SPH1601</td>
<td>Physics 1SA</td>
<td>10</td>
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<tr>
<td>SPH1602</td>
<td>Physics 1SB</td>
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<tr>
<th>Credit points</th>
<th>Year 2</th>
<th>Semester</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
<td>Two</td>
</tr>
<tr>
<td>SCA2000</td>
<td>Practical Flying 1 (GFPC)</td>
<td></td>
</tr>
<tr>
<td>SCA2102</td>
<td>Aircraft General Knowledge</td>
<td></td>
</tr>
<tr>
<td>SCA2103</td>
<td>Basic Navigation</td>
<td></td>
</tr>
<tr>
<td>SCA2104</td>
<td>Intermediate Aeronautical Knowledge</td>
<td>36</td>
</tr>
<tr>
<td>SCA1612</td>
<td>Applied Statistics 2</td>
<td></td>
</tr>
<tr>
<td>SCM2111</td>
<td>Data Communications and Networks 1</td>
<td>10</td>
</tr>
<tr>
<td>SCM2211</td>
<td>Database Systems 1</td>
<td></td>
</tr>
<tr>
<td>SCM2218</td>
<td>Database Systems 2</td>
<td></td>
</tr>
<tr>
<td>SCM3111 Object-Oriented Programming</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SCM3112</td>
<td>User Interface Design</td>
<td></td>
</tr>
</tbody>
</table>

| SCM3311 Object Oriented Programming | 2 |
| *54* | 66 |

**Year 3**

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Year 3</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
<td>Two</td>
</tr>
<tr>
<td>ACE3143</td>
<td>English Language and Communication 3</td>
<td></td>
</tr>
<tr>
<td>ACE3144</td>
<td>English Language and Communication 4</td>
<td>10</td>
</tr>
<tr>
<td>SCA3000</td>
<td>Practical Flying 2*</td>
<td>-</td>
</tr>
<tr>
<td>SCA3001</td>
<td>Practical Flying 3- *</td>
<td></td>
</tr>
<tr>
<td>SCA3100 Instrument Navigation</td>
<td>(IREX) 16</td>
<td></td>
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<tr>
<td>SCA3101</td>
<td>Advanced Aeronautics 1</td>
<td>30</td>
</tr>
<tr>
<td>SCA3104</td>
<td>Human Factors 4</td>
<td>-</td>
</tr>
<tr>
<td>SCA3103</td>
<td>Advanced Aeronautics 2</td>
<td>30</td>
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<tr>
<td>SCM2112</td>
<td>Software Engineering 1</td>
<td>10</td>
</tr>
<tr>
<td>SCM2313</td>
<td>Software Development</td>
<td>- 10</td>
</tr>
</tbody>
</table>

**Assessment**

The assessment for each subject is detailed in the subject listing.

**Course Regulations**

**Progression Regulations**

The section’s Academic Progress Committee (Board of Examiners’ Meetings) will, at the end of each semester consider the results and progress of all students enrolled in the course. Progression through the course is based on the following guidelines:

- Where any compulsory subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.
- For SCM coded subjects, students must not enrol in any subject for which at least an N1 grade hasn’t been attained in any of the prerequisite subjects.
- For SCA coded subjects a pass must be obtained in SCA subject pre-requisites as determined by the examining body, CASA before enrolment is permitted.
- Student enrolment will not normally be approved where the total proposed subject hours exceeds the normal semester load.

**Completion by Compensation**

Completion by compensation will be granted under the following conditions:

- Completion of subjects by compensation applies only to SCM1611, SCM1711, SCM1612, SCM1712, SPH1601, SPH1602.
If for a maximum of one of these subjects a student has an N1 grade and the average mark for all first year subjects is equal to or greater than 50, and all other subjects in the course have been passed, that student may be granted the award where that subject carrying the N1 grade is deemed completed by compensation.

The N1 grade in (ii) must be obtained in at most two sittings.

Completion by compensation is not a pass in a failed subject.

Unsatisfactory Progress

These regulations should be read in conjunction with the Victoria University Statute 6.4.1 – Unsatisfactory Progress.

The following regulations apply to both full-time and part-time students:

(a) The following shall constitute unsatisfactory progress:
- failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study;
- failure in any subject twice;
- transgression of a conditional enrolment stipulation and agreement.

(b) Where a student's progress is unsatisfactory, the section Academic Progress Committee may recommend the following:
- a restricted and conditional enrolment only be approved;
- exclusion from the course.

(c) A student who wishes to appeal against the section's written recommendation is required to do so in accordance with the University Statutes.

(d) Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission in the normal manner.

Bachelor of Science in Computer Technology

Course Code: EBCT

Course Objectives

The rapid advances in computer applications and technology, particularly in the communications and automation fields, mean that many commercial and industrial problems are of a multidisciplinary nature, requiring expertise in both Computer Systems and Electrical and Electronic Engineering. Graduates from this course would, therefore, possess the necessary skills to work in the electronic/computer systems engineering fields. To this end the course is strongly application oriented with a significant hardware and software project workload.

Admission Requirements

The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows:

- Mathematical Methods, English

Middle Band Selection

Bonuses that previously applied will be handled in the manner described in VTAC's general statement on middle band selection for the following studies: Physics (10%) and/or Specialist Mathematics (10%). The student profile, westernality and gender will also be considered. Please refer to the VTAC Guide.

Admission at Other Levels

Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner.

Course Structure

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
</tr>
<tr>
<td></td>
<td>One</td>
</tr>
<tr>
<td>ACE1141*</td>
<td>English Language and Communication 1</td>
</tr>
<tr>
<td>ACE1142*</td>
<td>English Language and Communication 2</td>
</tr>
<tr>
<td>EEA1001</td>
<td>Electrical Engineering 1.1</td>
</tr>
<tr>
<td>EEE1001</td>
<td>Electronics 1.1</td>
</tr>
<tr>
<td>EEE1002</td>
<td>Electronics 1.2</td>
</tr>
<tr>
<td>SCM1111</td>
<td>Introduction to Computer Systems 1</td>
</tr>
<tr>
<td>SCM1311</td>
<td>Programming 115</td>
</tr>
<tr>
<td>SCM1312</td>
<td>Programming 2</td>
</tr>
<tr>
<td>SCM1711</td>
<td>Mathematical Foundations 1</td>
</tr>
<tr>
<td>SCM1712</td>
<td>Mathematical Foundations 2</td>
</tr>
</tbody>
</table>

- Elective (one per semester from approved list) | 10 | 10

* Only for students who need extra English to be tested by English staff to replace semester one elective.

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EEA1002</td>
</tr>
<tr>
<td></td>
<td>(or equivalent) 1</td>
</tr>
<tr>
<td>EEC2501</td>
<td>Software Engineering 2.1</td>
</tr>
<tr>
<td>EED2502</td>
<td>Design Project 2.2</td>
</tr>
<tr>
<td>EEE2601</td>
<td>Microprocessor Systems 2.1</td>
</tr>
<tr>
<td>EEE2602</td>
<td>Microprocessor Systems 2.2</td>
</tr>
<tr>
<td>EEE2701</td>
<td>Digital Systems 2.1</td>
</tr>
<tr>
<td>EEE2702</td>
<td>Digital Systems 2.2</td>
</tr>
<tr>
<td>EET2502</td>
<td>Computer Communications A</td>
</tr>
<tr>
<td>SCM2311</td>
<td>Object Oriented Programming 1</td>
</tr>
<tr>
<td>SCM2711</td>
<td>Discrete Mathematics</td>
</tr>
<tr>
<td>SCM3311</td>
<td>Oriented Programming 2</td>
</tr>
<tr>
<td>Elective (not needed if student studies-AKE1141 and AKE1142)</td>
<td>10</td>
</tr>
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</table>

Course Duration

The course is offered over three years on a full-time basis. Students must complete 360 credit points.
Year 3
ACE3143  English Language and Communication 3  10  -
ACE3144  English Language and Communication 4  -  10
EED3510  Design Project 10
EEC3511  Software Engineering 3.1
Electives (3 from approved list)  30  -
Electives (4 from approved list)  -  40

60  60

Assessment
The assessment for each subject is detailed in the subject listings.

Course Regulations

Progress Regulations
The Academic Progress Committee (Board of Examiners' Meeting will, at the end of each semester consider the results and progress of all students enrolled in the courses. Progression through each course is based on the following guidelines:

(i) Where any compulsory subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure;
(ii) Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the prerequisite subjects;
(iii) Student enrolment will not normally be approved where the total proposed subject hours exceeds the normal semester load.

Completion by Compensation
Completion by compensation will be granted under the following conditions:

(i) Completion by compensation applies only to the elective subjects with the exception that a maximum of one of the compulsory first year subjects other than English Language and Communication 1 or 2 may be completed by compensation;
(ii) If for a maximum of three subjects, at most one being a first year subject (other than English Language and Communication 1 or 2) and the other electives, a student has an N1 grade, that student may be granted the award where those subjects carrying the N1 grade are deemed completed by compensation;
(iii) The N1 grades in (ii) must be obtained in at most two sittings;
(iv) Completion by compensation is not a pass in a failed subject.

Unsatisfactory Progress
These regulations should be read in conjunction with the Victoria University Statute 6.4.1 – Unsatisfactory Progress.

(a) The following shall constitute unsatisfactory progress:

• failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study;
• failure in any subject twice;
• transgression of a conditional enrolment stipulation and agreement.

(b) Where a student’s progress is unsatisfactory, the section Academic Progress Committee may recommend the following:

• a restricted and conditional enrolment only be approved;
• exclusion from the course.

(c) A student who wishes to appeal against the section's written recommendation is required to do so in accordance with the University Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University Statutes.

(w) Excluded students have no right of re-admission to the 10 course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of the exclusion. Students must provide, with their application, evidence of changed circumstances which significantly improve the applicant's likelihood of academic success.

Bachelor of Science (Honours) in Computer Technology
Course Code: EHEC

Course Objectives
The course is designed to enhance the skills acquired in the Computer Technology Degree course, by developing the research potential of the students and allowing in-depth study topics in a range of computer technology subjects.

The Honours Degree provides for a research project and a selection of advanced elective subjects. This year may lead to further postgraduate opportunities. The choice of subjects is dependent upon the student's background and intended area of further study.

Admission Requirements and Prerequisites
To qualify for admission the student must have completed an appropriate undergraduate course of at least three years in duration, and obtained results of 60% and higher in the majority of subjects undertaken.

Course Duration
The course is offered on a full-time basis over one year, or part-time equivalent.

Course Structure
Year 1
EEC4700  Research Project
Elective subjects (3 x 3 hours per semester)

The elective subjects are to be chosen from the range of final year undergraduate subjects (no more than two at third year level) and postgraduate subjects, as approved by the Course Coordinator.

Assessment
Assessment for each subject is given in the subject listings.

Bachelor of Science (Honours)
Students who do exceptionally well in their degree studies may be given the opportunity to gain an Honours degree by completing a fourth year of study in a specific field. This year is designed to assist students who may wish to proceed to higher degrees by research, but it also enables students to concentrate their studies more intensely on areas of particular interest.
The Honours year requires students to select coursework units from one of the fields of Computer Science, Statistics, and Operations Research. As well, a minor thesis must be completed.

**Bachelor of Science in Optoelectronics**

*Course Code: SBPO*

**Course Objectives**
The broad aim of this photonics course is to produce professionally qualified, and recognised, graduates with a strong background in both physics and optical technology. This can be complimented with business, legal and management electives to prepare graduates for employment in professional technical positions.

The optical technology components of the course emphasise, particularly in the third year, the technologically important areas of fibre optics, optoelectronics, laser physics and applied optics. Computer design and simulation of optical systems is included. The students are prepared for their professional working life by undertaking a major technical project. The physics, engineering and optical technology components of the course are complemented by the inclusion of relevant mathematics and computing subjects.

The business electives in the course provides insight into broad aspects of management systems, covering such areas as project management and control, communication skills, personnel management, cost benefit analysis and legal aspects of business.

Progression and exclusion regulations relating to this course and the former are given after the course structure.

**Admission Requirements**
The entry requirement is normally the successful completion of the VCE (or an equivalent course of study) with passes in Physics, Mathematics and English. In accordance with the VTAC selection scheme, the VCE prerequisites are – Units 3 and 4: English, Physics and Mathematical Methods or Specialist Mathematics. For students in the middle-band, preference will be given to those with Specialist Mathematics and/or Physics (see the general statement on middle-band selection as it appears in the VTAC Guide to University and TAFE Courses). For such students, consideration will also be given to the full range of an applicant’s VCE studies and results, to the level of performance in CATs, and to the student profile.

Applicants who do not satisfy the above requirements should contact the Selection Officer. Equivalent subjects and experience will be considered.

**Course Duration**
The course is offered on a full-time basis over three years.

**Course Structure**
*(Retired course introduced in 1997)*
Subjects are taken over six semesters (three years).

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td></td>
</tr>
<tr>
<td>EED1012</td>
<td>10</td>
</tr>
<tr>
<td>SCM1111</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE2190</td>
<td>5</td>
</tr>
<tr>
<td>EED2002</td>
<td>10</td>
</tr>
<tr>
<td>EMW2001</td>
<td>10</td>
</tr>
<tr>
<td>SMA2311</td>
<td>10</td>
</tr>
<tr>
<td>SMA2321</td>
<td>10</td>
</tr>
<tr>
<td>SPH2000</td>
<td>25</td>
</tr>
<tr>
<td>SPH2432</td>
<td>10</td>
</tr>
<tr>
<td>Elective</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCM2111</td>
<td>10</td>
</tr>
<tr>
<td>SMA3311</td>
<td>10</td>
</tr>
<tr>
<td>SPH3100</td>
<td>25</td>
</tr>
<tr>
<td>SPH3200</td>
<td>5</td>
</tr>
<tr>
<td>SPH3472</td>
<td>20</td>
</tr>
<tr>
<td>Elective</td>
<td>10</td>
</tr>
</tbody>
</table>

**Assessment**
The assessment for each subject is detailed in the subject listings. The use of electronic calculators and electronic storage devices is not permitted in any examination unless specified in the subject guide for that subject and/or examination paper for that subject.

**Course Regulations**

**Progression Guidelines for SBPC and SBPO**
1. Normally students must pass all subjects in a particular course year before being allowed to enrol in subjects in the subsequent course year.
2. Normally, students must complete any two consecutive years of the course within three calendar years of full-time equivalent enrolment.
3. Normally, students must complete the course in which they are enrolled within the following period:
   (a) Bachelors Degree Course – 10 years
   (b) Associate Diploma Course – 4 years
4. If the School allows a variation from the above the following guidelines shall apply:

(a) Where any compulsory subject of a course year must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.

(b) Students may enrol in subjects in not more than two consecutive years, provided that priority is given to subjects in the earlier course year.

(c) Students may not enrol in any subject for which the prerequisite has not been passed.

(d) Student who are not granted a Stage Completion by Compensation are required to enrol in all failed subjects before any approved additional subjects can be included with the same enrolment.

(e) Where enrolment includes a third attempt at any failed subject(s), enrolment in additional (first attempt) subjects will be permitted only with the approval of the Academic Committee of the section.

(f) Student enrolment will not normally be approved where the total proposed subject hours exceeds the normal total subject hours for a course year.

(g) Where a subject is being repeated, requests for exemption for part of the subject work (e.g. laboratory work) are at the discretion of the section offering the subject. Any exemptions granted will usually apply for one year only.

(h) Where the final assessment in a subject is based on the average mark obtained over two semesters, satisfactory performance will be required in each semester. A mark of less than 35% in any semester will normally be considered unsatisfactory even if the average mark exceeds 50%.

Exclusion Guidelines

Students in any of the following categories may be recommended for exclusion from the course:

(a) Those who fail a subject three times or obtain less than 40% on two occasions.

(b) Those who fail half or more of the subjects for which they enrol in any semester. For all-of-year subjects the half-year result will be included in the consideration for exclusion in that semester.

(c) Those who fail to comply with points 2 and 3 of the progression guidelines.

Those so identified by the Academic Committee of the Section may be recommended for exclusion from their course in accordance with the University Unsatisfactory Progress Regulations.

Stage Completion by Compensation

Stage completion by compensation is based on each of the full-time years of the course.

Students who fail in any subjects of any course year may, at the discretion of the Academic Committee of the Section be granted a compensatory stage completion to allow the student to go on to the next year of the course. This does not count as a pass in the subjects concerned by merely means that the student is not required to repeat them. The granting of a stage completion should be seen as an exceptional event rather than a formality. The stage completion is provided in order that the section may take account of a student's overall performance in allowing progression to the next stage of the course. Stage completion guidelines are as follows:

(a) Stage completion by compensation may be granted only for subjects where the student has gained an N1 result (40–49%).

(b) The maximum number of course hours for which Compensation may be granted in any one course year is 6 (averaged over the course year).

(c) The maximum number of course hours for which Compensation may be granted in the whole course is 10. Stage Completion may not be granted in any more than two course years.

(d) A Stage Completion will not normally be granted for a subject which has been attempted more than once.

(e) A Stage Completion will not normally be granted for a subject where a Stage Completion has previously been granted in a prerequisite.

Bachelor of Science (Honours) - Physics

Course Code: SHPC

Course Objectives

The course aims to broaden and deepen the student's knowledge and understanding of physics by the completion of advanced courses and to provide a basic training in the skills necessary to undertake research in physics. Research training will include the ability to devise, design and carry out research intended to yield data relevant to the solution of specific problems, the ability to develop and refine working hypotheses, to critically analyse data and to report results in an appropriate manner.

The research project is normally undertaken in one of the following areas of expertise of the section: optical fibre sensors, laser physics, optoelectronic imaging, applied optics and vacuum technology.

Admission Requirements

To qualify for entry to the honours program the applicant should have completed the requirements for a pass degree with major studies in an appropriate discipline. Entry is at the discretion of the Applied Physics section and applicants should normally have obtained a 'credit' average in the final year of the pass degree. For mature age applicants, an appropriate combination of qualifications and experience will be considered.

Course Duration

The course will be offered on a full-time basis over one year or part-time equivalent.

Course Structure

The structure of the course is as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPH4410</td>
<td>Physics 4 (Honours)</td>
<td>120 credit points</td>
<td></td>
</tr>
</tbody>
</table>

(60 per semester)

Academic Progression

A student will not be allowed to repeat the Honours year or any component of it without the permission of the Course Coordinator.
International Programs: Offshore Program Conducted in Hong Kong

Bachelor of Science in Computer Science

Course Code: SBCO

Course Objectives
This course specifically caters for part-time students in Hong Kong who wish to obtain a professional qualification in Computer Science.

The course aims to produce graduates who have a sound conceptual foundation including practical understanding of recent developments in computer science and how computer science based techniques may be applied to solve a wide range of problems in business and industry.

Admission Requirements
Students are admitted at either level 1 or level 2.

Level 1 Applicants should have a certificate (or equivalent) qualification with a quantitative background.

Level 2 Applicants should have qualifications in Engineering, Science or Computing at the Higher Certificate (or equivalent) level.

Course Structure

Level 1 Entrants

<table>
<thead>
<tr>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE3144  English Language and Communication 4 10</td>
</tr>
<tr>
<td>SCM1113  Computer Organisation and Architecture 10</td>
</tr>
<tr>
<td>SCM1311  Programming 1 15</td>
</tr>
<tr>
<td>SCM1612  Applied Statistics 2 10</td>
</tr>
</tbody>
</table>

Level 2 Entrants

<table>
<thead>
<tr>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCH3104  Computing Project 10</td>
</tr>
</tbody>
</table>

Plus eleven (11) semester subjects selected from:

<table>
<thead>
<tr>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCM2111  Data Communications and Networks 1 10</td>
</tr>
<tr>
<td>SCM2112  Operating Systems 10</td>
</tr>
<tr>
<td>SCM2211  Database Systems 1 10</td>
</tr>
<tr>
<td>SCM2218  Database Systems 2 10</td>
</tr>
<tr>
<td>SCM2311 Object Oriented Programming 1 10</td>
</tr>
<tr>
<td>SCM2312  Software Engineering 1 10</td>
</tr>
<tr>
<td>SCM2313  Software Development 10</td>
</tr>
<tr>
<td>SCM2314  Cobol Programming 10</td>
</tr>
<tr>
<td>SCM3311 Object Oriented Programming 2 10</td>
</tr>
<tr>
<td>SCM3312  Intelligent Systems 10</td>
</tr>
<tr>
<td>SCM3132  Programming 215</td>
</tr>
<tr>
<td>SCM2612  Statistical Forecasting 10</td>
</tr>
<tr>
<td>SCM2711  Discrete Mathematics 10</td>
</tr>
<tr>
<td>SCM3112  User Interface Design 10</td>
</tr>
</tbody>
</table>

Course Regulations
Students entering the program at level 1 are required to obtain a pass in at least sixteen subjects. Students entering the program at level 2 are required to obtain a pass in at least twelve subjects. Assessment throughout the course consists of tests, assignments, project work and end of semester examinations.

Regulations also include:
(a) A student cannot enrol in any subject without having passed the prerequisite;
(b) A student cannot undertake a project without having completed what the Academic Committee considers to be a suitable academic preparation;
(c) The following shall constitute unsatisfactory progress.
   • failure in 100% of enrolled subjects.
   • failure in any subject twice. (Failures in any examination and subsequent supplementary examination will be considered as having failed the subject once.)

Offshore Program Conducted in Malaysia

Bachelor of Science in Computer Science

Course Code: SBCO

The program offered to domestic students in Australia is also approved to be offered in Malaysia in conjunction with the SAL Group of Colleges. Currently students are accepted into the program with advanced standing and are able to complete the final year of the course in Malaysia.
School of Life Sciences and Technology

The School of Life Sciences and Technology operates across the Footscray, Werribee and St Albans campuses of the University. In line with Faculty objectives, the School is committed to the development and promotion of science and technology.

The School seeks to provide students with vocationally and educationally oriented experiences and expertise which will best equip them for entry into a work environment in which there is likely to be significant career changes during their working life. Consequently, the School provides courses and programs with a close relationship between theory and practice, and seeks to include relevant industrial experience within each award course.

The School also seeks to foster within its students a personal pride in, and a professional attitude to their work and a full understanding of their responsibilities to society as trained scientists and technologists.

It is the belief of the School that active involvement in research and consultancy is vital in providing quality teaching as well as in developing a viable and practical course for the students. To this end, most of the academic staff have a doctoral degree and substantial research and consultancy experience. The School endeavours to develop close relationships with industry and with the community to keep abreast of their respective needs. To this end student projects are performed in collaboration with industry, the community, government bodies, and research institutes wherever possible.

The School is equipped with world class laboratories and equipment for teaching and research as well as for industrial training programs. These include a state of the art Aquatic Research Laboratory, high performance liquid chromatographs, gas chromatograph-mass spectrometers, atomic absorption spectrophotometers, FTIR spectrometers, NMR, UV-Vis spectrophotometers, an Instron texture analyser, Infratech and NIR Systems food and feed analysers as well as excellent facilities for microbiological and genetic engineering work. Specialist facilities also include a fully-equipped, pilot-scale food processing hall.

The School also offers Master of Science and Doctor of Philosophy degrees by research and Masters and Graduate Diploma coursework programs. Further details are given in the Postgraduate Studies section of the Handbook.

Courses Offered

The School of Life Sciences and Technology offers undergraduate courses leading to the award of:

- Bachelor of Science (Honours)
- Bachelor of Applied Science
  - Chemistry
- Bachelor of Science
  - Biomedical Sciences
  - Conservation Biology and Environmental Management
  - Medical and Environmental Biotechnology
  - Medical, Forensic and Analytical Chemistry
  - Nutrition and Food Science
  - Occupational Health and Safety

School Regulations

The following regulations apply to all courses and subjects administered or taught by the School of Life Sciences and Technology and are in addition to University regulations governing these areas as laid down in the Statutes and Regulations.

Awards

A student shall qualify to receive an award when that student has successfully completed all the requirements and prescribed subjects of the course.

Assessment

Student assessment will embrace both formal assessment through final examination and continuous assessment incorporating unit tests, assignments, report writing, problem solving exercises, class presentations and laboratory, project and fieldwork.

Students would normally be expected to satisfactorily complete each component of the assessment to gain a pass in the subject.

Practical work

A minimum of 80% attendance is required at all practical sessions. Failure to attend at least 80% of practical sessions will automatically constitute unsatisfactory completion of the subject. Practical reports will only be accepted from those students who have attended practical sessions for their full duration.

Late submission

Students failing to submit assessable work by the prescribed deadline will incur a penalty of five (5) percentage marks per day for the first ten days after the prescribed deadline. Work submitted after this time will not be assessed and students will be granted a zero (0) grade.

This requirement may be varied at the discretion of the subject coordinator.

Supplementary Assessment

Students may be granted supplementary assessment with a maximum of two supplementary assessments being permitted in any one full-time academic year. Supplementary assessment will not be available for subjects that are being repeated.

Use of electronic calculators and storage devices

The use of electronic calculators and electronic storage devices is not permitted in any examination unless specified in the subject guide for that subject and/or on the examination paper for that subject.

Unsatisfactory Progress

Students in any one of the following categories may be asked to show cause as to why they should not be excluded from the course:

- those who fail 50% or more of their assessable enrolment load (expressed in subjects) in any semester;
- those who fail the same subject twice;
- those who transgress a conditional enrolment agreement.

Duration of Exclusion

Excluded students have no automatic right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of exclusion. These students must provide, with their application, evidence of changed
FACULTY OF ENGINEERING AND SCIENCE

circumstances which significantly improve the applicant’s chances of academic success.

**Progression**
Progression through the course is based on the following guidelines:
- Where any compulsory subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.
- Students may not enrol in any subject for which the prerequisite has not been passed.
- Student enrolment will not normally be approved where the total proposed subject hours exceeds the normal total subject hours for a course year.
- Where enrolment in a co-requisite subject is required, enrolment in the co-requisite subject must take preference over enrolment in an elective.
- Where a subject is being repeated, requests for exemptions for part of the subject work are at the discretion of the Department or School offering the subject. Any exemption granted will normally apply for one year only.

**Disciplinary Failure**
A student who has failed a subject on disciplinary grounds may not enrol in any further subjects without the permission of the Faculty Dean.

**Repeating Subjects**
A student who has withdrawn twice in any subject without receiving a penalty grade must seek the permission of the lecturer in charge before being permitted to re-enrol in that subject.

**Stage Completion**
A student may apply for a Stage Completion if:
- all subjects in the course except one have been passed;
- a result of N1 (40%–49%) is achieved in the failed subject;
- the failed subject is not a prerequisite for any other subject in the course.

The granting of a Stage Completion is at the discretion of the Head of School and is not regarded as a pass in the failed subject.

**Deferment from Award Course**
The following rules apply to the courses of the School and are in addition to University regulations governing these areas.
- Approval of deferment is not automatic.
- Each application to defer will be dealt with on an individual basis by the School Administrator in consultation with appropriate academic staff members.
- A deferment will not be granted to VTAC applicants requesting a deferment at their first enrolment session. Students who fall into this category will be advised to re-apply for a place at the end of the year.
- In normal circumstances students must have successfully completed at least one semester of study, by passing at least 50% of subjects undertaken, to be eligible for deferment.
- Except under exceptional circumstances students may apply to defer their studies for a total period not exceeding twelve months.
- Deferment will not normally be granted until consultation has taken place with the Course Co-ordinator (or nominee) and/or a student counsellor.
- Students failing to re-enrol at the end of their deferment period will automatically be withdrawn from their course of study.

**Further Information**
For further information please contact the School of Life Sciences and Technology on (03) 9365-2691 or fax (03) 9365-2465.

**Biology and General Science Teaching for Physical Education Graduates**
The School of Life Sciences and Technology has arranged elective subjects to assist Physical Education and Recreation students planning a secondary teaching career. The School offers two elective programs designed to facilitate the entry of Bachelor of Applied Science – Physical Education graduates into a second teaching method in a Diploma of Education course and to subsequently gain registration with the Ministry of Education to teach either Biology or General Science, in addition to Physical Education.

To obtain registration in General Science, the Ministry of Education requires that students take subjects equivalent to one quarter of the first year of their Bachelor of Applied Science course in each of two science areas, both of which have the potential to be extended to sub-majors. A sub-major in a science area is defined by the Ministry as a commitment of one quarter of the first year load and one quarter of the second year load to subjects in this science area.

The physical education degree at Victoria University, Footscray Park Campus, is based upon a unit system such that one semester-hour of contact is equivalent to one unit. Since the degree requires a minimum of 144 units (48 units per year), then one quarter of a year corresponds to 12 units. To obtain General Science registration based upon chemistry and biology therefore, requires at least 12 units devoted to chemistry and 12 units to biology in the first year of the degree.

To obtain registration in biology, it is necessary to take sufficient biology subjects to constitute a sub-major, i.e. at least 12 units of biology in first year and 23 units of biology in second year.

Details of the two streams of study are set out below; the code number is given for each subject.

**General Science Stream**

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS1006</td>
<td>Chemistry 1</td>
</tr>
<tr>
<td>SBM1518</td>
<td>Human Physiology 1</td>
</tr>
<tr>
<td>SBM1528</td>
<td>Human Physiology 2</td>
</tr>
<tr>
<td>SBM2260</td>
<td>Diet and Nutrition</td>
</tr>
</tbody>
</table>

**Biology Stream**

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBF2192</td>
<td>Applied Microbiology</td>
</tr>
<tr>
<td>SBM1518</td>
<td>Human Physiology 1</td>
</tr>
<tr>
<td>SBM1528</td>
<td>Human Physiology 2</td>
</tr>
<tr>
<td>SBM2260</td>
<td>Diet and Nutrition</td>
</tr>
<tr>
<td>SBM3264</td>
<td>Advanced Nerve and Muscle Physiology</td>
</tr>
</tbody>
</table>

**Bachelor of Applied Science in Chemistry**

*Course Code: SBCP*

**Course Objectives**
This course provides a sound background in the fundamentals of chemistry and leads to a professional qualification which meets the membership requirements of the Royal Australian Chemical
Institute. The course has major emphasis on analytical and organic chemistry and includes significant studies in other areas.

**Course Duration**
This course is specifically designed for part-time study by students employed in chemical and related industries. The course recognises that students in employment develop a wide range of on-the-job skills and consequently it only includes a limited number of subjects in areas other than chemistry. The course is organised to enable completion in six years but may be completed in a shorter time if work commitments permit. Employment in a chemical or related industry for a minimum of three (3) years is a co-requisite and is required for graduation.

**Admission Requirements**
Applicants should have successfully completed VCE or another Year 12 qualification in studies English and Mathematics. Applicants with other qualifications should seek advice from the Faculty of Engineering and Science. An aptitude for science should be evident.

Potential students for the Bachelor of Applied Science in Chemistry should apply directly to the University.

**Course Structure**

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemical</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Medical, Forensic and Analytical Chemistry</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Mathematics Part 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Mathematics Part 2</td>
<td>-</td>
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<tr>
<td></td>
<td>Physics 1SA</td>
<td>10</td>
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<tr>
<td></td>
<td>Physics 1SB</td>
<td>-</td>
</tr>
</tbody>
</table>

Stage Completion by Compensation
Each degree course is composed of three years.

**Year Completed**
- XXX0120 Completed First Year \( \text{SBPC} \)
- XXX0220 Completed Second Year \( \text{SBPC} \)
- XXX0320 Completed Third Year \( \text{SBPC} \)

**Stage Completed by Compensation**
- XXX1020 Stage Completed by Compensation, First Year \( \text{SBPC} \)
- XXX2020 Stage Completed by Compensation, Second Year \( \text{SBPC} \)
- XXX3020 Stage Completed by Compensation, Third Year \( \text{SBPC} \)

**Course Completed**
- XXX3320 Course Complete \( \text{SBPC} \)

Under certain conditions a student may be granted Stage Completion by Compensation for a Stage of the course even though pass results have not been obtained for all subjects in that Stage. This does not mean that a student is granted passes in the subjects failed; rather, it means that the overall performance in the Stage is such as to allow the student to progress to the next Stage of the course without repeating the subjects failed.

Stage Completion by Compensation will not be granted where a fail assessment (N1 or N2) has been obtained in any of the following subjects.
- SCS1006 Chemistry 1
- SCS2511 Applied Chemistry 2 - Analytical
- SCS3511 Applied Chemistry 3 - Analytical
- ACE3020 Written and Oral Communication 3 (P/T)

Where one or more subjects within a Stage are assessed as N1 (40–49%) Stage Completion by Compensation may be granted provided that the semester hours associated with the failed subjects do not total more than eight (8) hours (a semester hour is defined as one hour of contact per week for one semester)

A student granted a Stage Completion by Compensation should be aware that a statement to this effect will appear on the student's academic record.

**Bachelor of Science in Biomedical Sciences**

**Course Objectives**
The Bachelor of Science in Biomedical Sciences is designed to provide professional training in the application of science to human biology in the market place. The course aims to produce highly flexible but well-trained graduates who will be adequately equipped to adapt to a changing environment. Four different streams are available for this degree in Biomedical Sciences including wellness management, science media and communications, marketing of biomedical products, and medical research/clinical sciences. Although, students are encouraged to follow one of these streams, they are able to choose from the entire range of subjects offered in the Biomedical Sciences degree. The overall objectives of the degree in Biomedical Sciences are to provide graduates with an excellent knowledge of human physiological functions together with skills in critical analysis and with highly developed communication skills. Complementary knowledge will be developed in a wide range of selected disciplines including psychology, human development,
management, marketing, visual and audiovisual communications and a language.

The Wellness Management stream is designed to produce graduates with an understanding of human function. Graduates will be eligible for employment as Wellness consultants either in private practice or within government agencies, large companies or corporations. The Science, Media and Communications specialisation is more specifically designed to produce graduates who would be knowledgeable in human biology and biomedical sciences. Graduates would have a broad education, being highly literate and articulate in specialised areas such as an Asian Language, Professional Writing, and Communications. Graduates in the Management and Marketing of Biomedical Products stream will have an in-depth knowledge of basic human biological function combined with specialised skills in either human resource management or in marketing. This combination of skills appears to be unique in Australia as there seems to be no other course in Australia with this combination of subjects. The Medical Research/ Clinical Sciences stream will provide students with a range of skills appropriate to leading edge medical research. This degree offers a range of subjects appropriate for further postgraduate study in medical and paramedical fields.

Course Duration
The course will be equivalent to three years of full-time study for students entering the course at year 1 or part-time equivalent.

Admission Requirements
Students entering the course would normally be expected to have completed VCE or equivalent with at least a D grade in English. Entry to the degree program can also be attained through TAFE articulation or under mature age provisions.

Course Location
The course is currently offered at the St Albans campus, but individual subjects may be offered at the Footscray or Werribee campuses.

Course Structure
The course will comprise two 13 week semesters or 26 weeks per year for three years. The course outline together with the contact hours per week is contained in the following pages. First year subjects listed are currently running at the St Albans campus.

Electives may be taken from the wide range of science and general subjects listed below. Other suitable electives (not listed below) may also be chosen subject to the approval of the course co-ordinator. If general electives are selected, students are encouraged to take a 4 to 6 semester sequence in one of the following areas including Human Resource Management, Marketing, Communications, Psychology, Professional Writing or a language other than English. Electives will be offered subject to adequate demand.

Students enrolled in the Biomedical Science course Degree must take a minimum of 60% of their total credit points from subjects offered by the School of Life Sciences and Technology. In addition, no more than 40 credit points from general elective subjects shall be at first year level, and at least one elective shall be commensurate with the year of the student's course.

Year 1
Core Subjects

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
<th>One</th>
<th>Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE1910</td>
<td>Communications for Science</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>SBM1518</td>
<td>Human Physiology 1</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>SBM1528</td>
<td>Human Physiology 2</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>35</td>
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First Year Science Electives

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
<th>One</th>
<th>Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBM1100</td>
<td>Foundations in Biomedical Science</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>SBM1514</td>
<td>Functional Anatomy 1,2,3,4</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>SCS1110</td>
<td>Chemistry for Biological Sciences A,1,2,3,4</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>SCS1120</td>
<td>Chemistry for Biological Sciences B,1,2,3,4</td>
<td>-</td>
<td>15</td>
</tr>
<tr>
<td>SMA1110</td>
<td>Mathematics 1</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>SMA1120</td>
<td>Mathematics 2</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>SPH1210</td>
<td>Physics 1F (or equivalent)</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>SPH1220</td>
<td>Physics 1F (or equivalent)</td>
<td>-</td>
<td>10</td>
</tr>
</tbody>
</table>

First Year General Electives

Any foreign language at first year level 10
ACC1042 Communications Studies A,2 | 10
ACC1042 Communications Studies B,3 | 10
ACP1051 Foundations in Professional Writing A,2 | 10
ACP1051 Foundations in Professional Writing B,3 | 10
APP1012 Psychology 1A,1 | 10
APP1013 Psychology 1B,1 | 10
BMO1102 Management and Organisational Behaviour | 10
BHO1171 Introduction to Marketing | 10
BMO1122 Human Resource Management | 10
BHO2434 Consumer Behaviour | 10
BCF9110 Introduction to Computing | 10
BEO1106 Business Statistics | 10

1 Students in the Wellness Management stream are encouraged to take these electives
2 Students in the Science, Media and Communication stream are encouraged to take these electives (If students take ACC1042 Communications Studies they are exempt from ACE1910 Communications for Science)
3 Students in the Management and Marketing of Biomedical Products stream are encouraged to take these electives
4 Students in the Medical Research and Clinical Sciences stream are encouraged to take these electives

Credit points

Semester

One   Two

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
<th>One</th>
<th>Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBM2800</td>
<td>Cardiorespiratory &amp; Renal Physiology</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>SBM2530</td>
<td>Pathophysiology 1 (Human Bioscience 3A)</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>SBM2260</td>
<td>Diet and Nutrition (Pathophysiology 2 (Human Bioscience 4A))</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>25</td>
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</tbody>
</table>

Second Year Science Electives
SBM1524 Functional Anatomy 1,2,4 20 - SBM3264 Advanced Nerve and
SBM2560 Medical Biochemistry 3,4 15 - Muscle Physiology 4 - 20
SBM2590 Functional Histology 3,4 10 - SBM3550 Advanced Bioscience 5A 1 20 -
SBF2360 Introduction to Microbiology 4 10 - SBM3560 Advanced Bioscience 6A 1 - 20
SBM2610 Biomedical Sciences and Society 1,2 10 - SBM3590 Advanced Histological Techniques 4 20 -
SBM2361 Epidemiology 3 5 - SBF3660 Developmental and Clinical
SBF2330 Cell Biology 2,3,4 - 10 - Immunology 1,2,3 - 20
SBM2524 Functional Anatomy 3,4 10 - SBF3720 Wellness 11 20 -
SBM3620 Challenging the Scientific 10 - SBM3820 Wellness 22 20 -
Paradigm 1,2 10 - SBF3913 Project 1,2,3 20 -
SBF2300 Microbiology 1,5 10 - Electives 20-25 20-25
SBF2922 Science and Society 10 -
SCS3310 Public Health 5 -
SBF2390 Molecular Genetics -
SCS2372 Toxicology 1A 5 -
SCS2510 Analytical Chemistry 10 -

Second Year General Electives
ACP2062 Editing and Publishing 2 10 -
ACP2066 Writing for Mass Media 2 10 - SBF3210 Advanced Nutrition 10 -
APP2013 Psychology 2A 15 - SBM3230 Nutrition and Health 10 -
APP2014 Psychology 2B 15 - SBM3620 Science, Media and Communication 10 -
BAO2207 Employment Law 10 - SBF3630 Advanced Nutrition 10 -
BHO2250 Advertising and Product and Pricing Strategy 10 -
BMO2300 Career Planning and Public Relations 10 -
BMO285 Marketing Research 1,2 10 -
BMO3420 Human Resource Information 10 -
BMO3476 Training and Development 1,2 10 -
HPE2165 Introduction to Biomechanics 5 - SBF3640 Advanced Neurosciences 10 -
HPE2180 Resistance Training 5 - SBF3650 Advanced Reproduction and
HPE2260 Sports Biomechanics 5 - Development 10 -
HPE2265 Laboratory Methods in Biomechanics 5 - SBF3670 Molecular Psychology 10 -
Any foreign language at second level 10 - SBF3760 Recombinant DNA Technology 20 -

Third Year Science Electives
SBF3210 Advanced Nutrition 10 -
SBM3230 Nutrition and Health 10 -
SBM3620 Science, Media and Communication 10 -
SBM3630 Advanced Nutrition 10 -
SBM3640 Advanced Neurosciences 10 -
SBM3650 Advanced Reproduction and Development 10 -
SBM3670 Molecular Psychology 10 -
SBF3760 Recombinant DNA Technology 20 -
SCS2373 Toxicology 1B 5 -

Third Year General Electives
Any foreign language at third year level 10 - ACC3045 Video Production 10 -
ACC3046 Communicating with Radio 10 - ACC3047 Communicating in Organisations 10 -
ACC3050 Communication through Cinema 10 -
ACP3051 Writing for Publications and Advertising 2 10 -
ACP3052 Scripting, Directing & Producing the Documentary 10 -
ACP3053 Advanced Fiction Writing 10 -
BEO1185 Retail Management Principles 10 -
BHO2252 Selling and Sales Management 10 -
BHO3525 Advanced Marketing Research 10 -
BHO3435 Marketing Planning Strategy 1,2 10 -
BHO3373 International Marketing 10 -
BMB3325 Human Resource Management and Evaluation 1 10 -
BMO3322 Employee Relations Management 1 10 -

Year 3 Subjects
Core Subjects
Students must choose at least two of the six core units offered in each semester.

Credit points
Semester
One Two
SBF 3920 Biometrics and Experimental Design 1,2 15 -
SBM2810 Pharmacology 3,4 20 -

1 Students in the Wellness Management stream are encouraged to take these electives (Students in the Wellness stream who decide to focus on individual and social issues in mental health should choose Psychology 2A and 2B). 1
2 Students in the Science, Media and Communication stream are encouraged to take these electives 2
3 Students in the Management and Marketing of Biomedical Products stream are encouraged to take these electives 3
4 Students in the Medical Research and Clinical Sciences stream are encouraged to take these electives 4

1 Students in the Wellness Management stream are encouraged to take these electives 1
2 Students in the Science, Media and Communication stream are encouraged to take these electives 2
3 Students in the Management and Marketing of Biomedical Products stream are encouraged to take these electives 3
4 Students in the Medical Research and Clinical Sciences stream are encouraged to take these electives 4
Progression Regulations
At Examiners’ Meetings at the end of each semester the results and progress of all students enrolled in the course will be considered.

Progression through each course will be based on the following guidelines:
• Where any core subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.
• Students will normally be allowed to enrol in any subject for which at least a P grade has been attained in the prerequisite subjects.
• Student enrolment will not normally be approved where the total proposed subject hours exceeds the normal semester load.
• Where enrolment in a co-requisite subject is required, enrolment in the co-requisite must take preference over enrolment in an elective.

Completion by Compensation
Completion by compensation will apply only to the elective subjects with the exception that a maximum of one of the compulsory first year subjects may be completed by compensation.

Unsatisfactory Progress
These regulations should be read in conjunction with the Victoria University’s Statute 6.4.1 – Unsatisfactory Progress. The following regulations apply to both full-time and part-time students.
(i) The following shall constitute unsatisfactory progress:
   (a) failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study.
   (b) failure in any subject two times.
   (c) transgression of a conditional enrolment agreement.
(ii) Where a student's progress is unsatisfactory, the School Academic Progress Committee may recommend as follows:
   (a) a restricted and conditional enrolment only to be approved.
   (b) exclusion from the course.

Bachelor of Science in Conservation Biology and Environmental Management
Course Code: SBBE

Course Objectives
Students taking the conservation biology and environmental management specialisation gain in-depth training in the measurement, analysis and management of biological diversity and related environmental resources. The course structure is practically based and flexible, allowing a range of in-depth studies, including: restoration ecology, marine and freshwater biology, pollution biology and ecotoxicology, environmental microbiology and sustainable resource use. Combined studies with molecular biology and analytical biochemistry are also possible. Students are trained for a wide range of government, industry and community based career opportunities, including council and shire conservation and planning positions, parks management, environmental consultancies, EPA, landcare and weed control managers, and other types of conservation and environmental management.

Admission Requirements
The minimum entry requirement for persons under 21 years of age on 1 January 2002 is the satisfactory completion of a Year 12 course of study approved by the Victorian Curriculum and assessment Board (VCAB), or an equivalent program approved by Victoria University for entry.

Prerequisites are Units 1 and 2 Chemistry and Units 3 and 4 at a grade D average in the following subjects: English and Mathematical Methods.

There is also provision for mature age and entry as a disadvantaged person. Mature age provisions apply to those persons aged 21 and over as at 1 January for the year in which they are applying.

Course Duration
The Bachelor of Science program requires the equivalent of three years full-time study.

Course Structure

<table>
<thead>
<tr>
<th>Year</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
</tr>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
</tr>
<tr>
<td>ACC1910 Communications for Science</td>
<td>5</td>
</tr>
<tr>
<td>BCF9110 Introductory Computing</td>
<td>-</td>
</tr>
<tr>
<td>Or Elective if VCE computing completed</td>
<td></td>
</tr>
<tr>
<td>SBF1310 Biology 1</td>
<td>15</td>
</tr>
<tr>
<td>SBF1320 Biology 2</td>
<td>-</td>
</tr>
<tr>
<td>SBF2420 Environmental Issues</td>
<td>10</td>
</tr>
<tr>
<td>SBF2432 Environmental Science</td>
<td>-</td>
</tr>
<tr>
<td>SCS1110 Chemistry for Biological Sciences A</td>
<td>15</td>
</tr>
<tr>
<td>SCS1120 Chemistry for Biological Sciences B</td>
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<tr>
<td>SMA1120 Mathematics 2</td>
<td>-</td>
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<tr>
<td><strong>Year 2</strong></td>
<td></td>
</tr>
<tr>
<td>SBF2311 Ecosystems</td>
<td>15</td>
</tr>
<tr>
<td>SBF2364 Conservation Biology</td>
<td>-</td>
</tr>
<tr>
<td>SBF2372 Ethology</td>
<td>15</td>
</tr>
<tr>
<td>SBF2452 Environmental Biology</td>
<td>-</td>
</tr>
<tr>
<td>SBF2460 Animal Biology</td>
<td>-</td>
</tr>
<tr>
<td>SBF2470 Plant Biology</td>
<td>15</td>
</tr>
<tr>
<td>at least one of</td>
<td></td>
</tr>
<tr>
<td>SBF2331 Microbiology</td>
<td>15</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>SBF2520 Biochemistry</td>
<td>15</td>
</tr>
<tr>
<td>Electives</td>
<td>10</td>
</tr>
<tr>
<td><strong>Year 3</strong></td>
<td></td>
</tr>
<tr>
<td>at least one of</td>
<td></td>
</tr>
<tr>
<td>SBF2331 Microbiology</td>
<td>15</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>SBF2520 Biochemistry</td>
<td>15</td>
</tr>
<tr>
<td>Electives</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>55</td>
</tr>
</tbody>
</table>

NOTE: Other combinations of studies may be approved following discussions with the course coordinator.
Terrestrial Ecology & Restoration
SBF3920 Biometrics & Experimental Design 15
SBF3321 Renewable Resource Management 15
SBF3320 Rehabilitation and Restoration Ecology - 15
Electives 30
60 60

Pollution Biology
SBF3920 Biometrics & Experimental Design 15
SBF3455 Ecotoxicology & Pollution Biology - 15
SBF3321 Renewable Resource Management 15 -
Electives 45
60 60

Freshwater & Marine Ecology
SBF3920 Biometrics & Experimental Design
SBF3343 Freshwater and Marine Ecology 15 -
SBF3321 Renewable Resource Management 15 -
Electives 30
60 60

Conservation Biology with Molecular Biology Electives
SBF3920 Biometrics & Experimental Design 15 -
SBF3760 Recombinant DNA Technology 15 -
SBF3321 Renewable Resource Management 15 -
And at least one of the following:
SBF3343 Freshwater and Marine Ecology 15 -
or
SBF3455 Ecotoxicology and Pollution Biology - 15
or
SBF3320 Rehabilitation and Restoration Ecology - 15
Electives 15
60 60

NOTE: Students undertaking this stream need to complete both SBF2331 Microbiology 1 and SBF2520 Biochemistry 1 in their year 2 of study. Studies in SBF3760 Recombinant DNA Technology take place at Werribee campus only.

Electives
At least five electives are required to be taken over the course of the degree. Electives in areas other than listed below may be selected at the discretion of the Head of School. The total subject hours must be within the prescribed range and due consideration must be given for prerequisites.

Science electives may be chosen from any of the degree subjects offered by the Faculty of Engineering and Science at St Albans, Werribee and Footscray Park campuses.

Appropriate subjects from other programs offered by other Schools and Faculties or at other Institutes, may also be selected as elective subjects, subject to the approval of the appropriate Faculty. Students should refer to the subject outlines listed within other Schools and Faculties for further information.

Students are advised to seek the assistance and advice of academic staff when making their elective selection, as the judicious choice of electives can provide an opportunity to undertake a second major study alongside the primary degree specialisation.

The following subjects are available as electives within the structure of the degree program:
BEQ2164 Economics of Environmental Management
SBF2372 Ethology
SBF2330 Cell Biology
SBF2750 Nutrition
SBF2922 Science and Society
SBF3530 Environmental Philosophy
SBF3760 Recombinant DNA Technology
SCS2250 Process Engineering 1
SCS2562 Environmental Chemistry
SCS3411 Environmental Legislation
SCS3432 Occupational and Public Health
SCS3481 Liquid and Solid Wastes
SCS3492 Air Quality Management
SBF3540 Leadership and the Environment
SCS3570 Indigenous Society & Environmental Management

Year 3 Electives
SBF3320 Rehabilitation and Restoration Ecology
SBF3455 Ecotoxicology and Pollution Biology
SBF3321 Renewable Resource Management
SBF3343 Freshwater and Marine Ecology
SBF3400 Microbial Ecology

Field Trips
Students may be required to participate in field trips of up to three days duration for certain subjects. Participation in these activities forms part of the assessment of these subjects and provides essential experience in field biology techniques. Exemption from these activities is only available by prior application where cultural or personal circumstances preclude participation.

Professional Recognition
Graduates of the Conservation Biology and Environmental Management degree are eligible to join professional bodies such as the Ecological Society of Australia and the Australian Institute of Biologists.
Bachelor of Science in Medical and Environmental Biotechnology

Course Code: SBMB

Course Objectives

Students taking the biotechnology specialisation gain in-depth training in many areas of modern biology including: microbiology, genetic engineering, molecular biology, bioprocessing technology and biochemistry. There is a strong emphasis on the development of laboratory-based skills, and the school is equipped with excellent facilities for this. The course will prepare students for careers in medical sciences (e.g. hospital laboratories, cancer research, pathology laboratories), forensic sciences, pharmaceuticals, agricultural sciences, the food industry, and educational institutions.

Admission Requirements

The minimum entry requirement for persons under 21 years of age on 1 January 2002 is the satisfactory completion of a Year 12 course of study approved by the Victorian Curriculum and assessment Board (VCAB), or an equivalent program approved by Victoria University for entry.

Prerequisites are Units 3 and 4 at a grade D average in the following subjects: English, and Mathematical Methods.

There is also provision for mature age entry and entry as a disadvantaged person. Mature age provisions apply to those persons aged 21 and over as at 1 January for the year in which they are applying. Entry into the degree can also be attained through TAFE articulation.

Course Duration

The Bachelor of Science program requires the equivalent of three years full-time study.

Course Structure

Medical and Environmental Biotechnology

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
</tr>
<tr>
<td>ACE1910</td>
<td>Communications for Science</td>
</tr>
<tr>
<td>BCF9110</td>
<td>Introductory Computing</td>
</tr>
<tr>
<td>SBF1310</td>
<td>Biology 1 - 20</td>
</tr>
<tr>
<td>SBF1320</td>
<td>Biology 2 -</td>
</tr>
<tr>
<td>SCS1003</td>
<td>Chemistry 1E - 20</td>
</tr>
<tr>
<td>SMA1110</td>
<td>Mathematics 1 10</td>
</tr>
<tr>
<td>SMA1120</td>
<td>Mathematics 2 -</td>
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<td><strong>Year 2</strong></td>
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<tr>
<td>SBF2300</td>
<td>Microbiology 115</td>
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<tr>
<td>SBF2310</td>
<td>Microbiology 2 -</td>
</tr>
<tr>
<td>SBF2330</td>
<td>Cell Biology - 10</td>
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<td>SBF2390</td>
<td>Molecular Genetics</td>
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<td>Biochemistry 2 -</td>
</tr>
<tr>
<td>Electives</td>
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</tbody>
</table>

Year 3

<table>
<thead>
<tr>
<th>Core Units</th>
<th>Credit points</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBF3251</td>
<td>Bioprocessing Technology 1 - 20</td>
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</tr>
<tr>
<td>SBF3252</td>
<td>Bioprocessing Technology 2 -</td>
<td></td>
</tr>
<tr>
<td>SBF3510</td>
<td>Preparative and Analytical Biochemistry - 20</td>
<td></td>
</tr>
<tr>
<td>SBF3760</td>
<td>Recombinant DNA Technology - 20</td>
<td></td>
</tr>
</tbody>
</table>

Elective Units

| SBM3720    | Immunology - 20 |
| SBF3730    | Food Microbiology - 20 |
| SBF3750    | Industrial and Environmental Microbiology - 20 |
| SBF3910    | Project – Biotechnology - 20 |

60  60

Students must take all four of the above core units above plus two of the electives above (or other electives approved by the Course Co-ordinator).

Electives

A minimum of 90 credit points worth of electives are required to be taken over the course of the degree. Electives in areas other than science may be selected at the discretion of the Head of the School. The total subject hours must be within the prescribed range and due consideration must be given to prerequisite requirements.

Science electives may be chosen from any of the degree subjects offered by the Faculty of Engineering and Science at the St Albans, Werribee and Footscray campuses.

Appropriate subjects from other programs offered by other Schools and Faculties or at other Institutes, may also be selected as elective subjects, subject to the approval of the Faculty. Students should refer to the subject outlines listed within other Schools and Faculties for further information.

Students are advised to seek the assistance and advice of academic staff when making their elective selection, as the judicious choice of electives can provide an opportunity to undertake a second major study alongside the primary degree specialisation.

Bachelor of Science in Medical, Forensic and Analytical Chemistry

Course Code: SBMF

Course Objectives

The course provides theoretical and practical training in medical, forensic and analytical chemistry. The design of the course has taken account of recent market research which indicates that employers seek graduates with specific skills in analytical chemistry as applied to industrial, medical and forensic issues. Concomitant studies in Molecular Sciences, Biosciences, Communication, Mathematics and Computer literacy give the graduate the employment skills that support the technical expertise.

15
The course is designed to meet the professional membership requirements of The Royal Australian Chemical Institute (RACI).

Course structure commences with a typical first year which exposes the student to a wide range of science disciplines. Second year has a core of subjects and a range of electives. In the final year chemical knowledge and applications are consolidated through a choice of appropriate electives.

**Admission Requirements**

Admission will be based upon completion of VCE or equivalent Year 12 qualification. Prerequisites are Units 3 and 4 in English and Mathematics. In accordance with the University's open access policy, the absence of prior studies in chemistry in particular, and science in general will not preclude admission to the proposed course. However, applicants who have successfully completed Chemistry and/or Specialist Mathematics and/or Physics will be deemed to have a TER of 3 percentage points higher for each study. Certain subjects passed in other courses at Victoria University or other Institutions may be considered for advanced standing. Provision will be made for articulation from TAFE science programs with appropriate credit.

**Course Duration**

The course is offered on a full-time basis over three years or part-time equivalent.

**Course Structure**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Credit points</th>
<th>Semester</th>
<th>Course Code</th>
<th>Title</th>
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<tbody>
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**Year 2**

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**Electives**

A total of 50 credit points selected from the following or other agreed electives of which one must be either Medical Chemistry 2 or Forensic Chemistry 2.

**Bachelor of Science in Nutrition and Food Science**

**Course Code:** SBNF

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<td>SBM3264</td>
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**Course Objectives**

The Nutrition and Food Science degree is designed to develop the knowledge and skills in the science and processing of food, its safety and quality as required by today’s nutritionists and food scientists, while providing the opportunity to specialise in one of the following areas: Food Technology, Nutrition, Food Biotechnology or Food Business Studies. The professional education and training provided in each of these specialisations or streams will ensure that graduates will be equipped with highly marketable skills to enable them to gain employment in, and contribute to the future development of the food and allied industries.

Increasing consumer awareness and demands in regard to food related health issues and the increasingly important role of nutrition in the development and evaluation of food products has generated a rapidly growing need for graduates with a good understanding of both food processing and nutrition. The Food Science and Nutrition stream has been specifically designed to meet the demand for such graduates.

The stream in Food Biotechnology is designed to provide graduates with a sound knowledge of traditional food processing technologies together with the skills and knowledge in modern molecular biology that will be required by tomorrow’s food and fermentation industries. Such graduates are likely to find ready employment in the production, research and development and analytical services sectors of industry or government.
The **Food Technology** stream is designed to meet the needs of both students, who have an interest in the production or processing side of the industry, and industry, who demand well qualified graduates for production supervision and quality assurance roles within the manufacturing environment. Such graduates will play a key role in the hygienic and safe production of food products.

The marketing of ingredients and services to the food industry has been identified as a major focus of employment for appropriately trained food science and technology graduates. The **Food Science and Business Studies** stream has been designed to equip students in both science and relevant business areas to enable them to gain employment in the sales, service and management sectors of the food and allied industries.

### Admission Requirements

The minimum entry requirement for persons under 21 years of age on 1 January 2002 is the satisfactory completion of a Year 12 course of study approved by the Victorian Curriculum and Assessment Board (VCAB), or an equivalent program approved by Victoria University for entry.

Prerequisites for the Nutrition and Food Science course are Units 3 and 4 at a grade D average in the following subjects: English, Chemistry and Mathematical Methods.

There is also provision for mature age and entry as a disadvantaged person. Mature age provisions apply to those persons aged 21 and over as at 1 January for the year in which they are applying.

### Course Duration

The Bachelor of Science program requires the equivalent of three years full-time study.

### Course Structure

The course requires the completion of a number of compulsory or core subjects together with prescribed and free electives, totalling a minimum of 120 credit points per year of full-time study. The prescribed elective subjects will determine the particular stream or specialisation within the degree program and students may choose from one of four streams according to their particular interest. The four streams are: Food Technology; Food Science and Nutrition; Food Biotechnology; and Food Science and Business Studies.

#### Year 1

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<table>
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#### Year 2

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### Prescribed Electives

#### Food Technology Stream

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<td>Food Microbiology</td>
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<td>SBF3732</td>
<td>Plant Food Processing</td>
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<td>SBF6750</td>
<td>Food Safety and Quality Assurance</td>
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#### Food Science and Nutrition Stream

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#### Food Science and Business Studies Stream

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**Suitable Free Electives**

**NOTE:** Some may already be prescribed for certain streams.

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**SBM3800** Science Media and Communication 3 10

Students are advised to seek the assistance and advice of academic staff when making their elective selection.

**Professional Recognition**

The Food Science and Technology specialisation has been accredited by the Australian Institute of Food Science and Technology and graduates in this specialisation will be eligible for membership.

**Bachelor of Science in Occupational Health and Safety**

**Course Code:** SBOH

**Course Objectives**

The aims of the courses are to produce graduates with a combination of knowledge and skills of science and disciplines related to occupational health and safety while having a focus on the management of occupational health and safety.

At the end of the course graduates should be able to utilise methods of scientific investigation in solving, occupational health and safety problems; thoroughly understand the scientific and technological bases of occupational health and safety; engender the professional confidence and respect of others; identify health hazards and safety problems and be able to make appropriate recommendations to management; understand and be able to effectively participate in decision-making processes in organisations in order to manage the promotion and implementation of occupational health and safety matters; act as an agent of change to improve OH&S at a workplace.

**Admission Requirements**

Normal entry requirements for articulation to the Bachelor of Science are the successful completion of an Associate Diploma, Certificate IV, or Diploma related to occupational health and safety or equivalent level. A significant number of such applicants are expected from occupational health and safety professionals seeking to upgrade from these qualifications to a degree in Occupational Health and Safety. Admission requirements may be varied by the Head of School particularly in the case of mature age applicants who possess appropriate TAFE or university qualifications related to occupational health and safety.

Diploma qualifications in occupational health and safety from TAFE or university are recognised as equivalent with the Diploma of Science in Occupational Health and Safety, allowing TAFE students to directly upgrade this qualification to a Degree.

Students with a Diploma in Health Occupational Health and Safety, will complete 13 units to upgrade their qualification to a Bachelor of Science in Occupational Health and Safety. All these units are delivered through the Faculty of Engineering and Science. Some students who enrolled with an Associate Diploma and then gained a Diploma of Science in Occupational Health and Safety may also need to undertake a mix of additional management units offered by the Faculty of Business if they wish to upgrade to a degree.
obtained to complete units by distance education mode if a student cannot attend timetabled classes.

**Course Duration**

Students who articulate into the degree course with a Diploma of Health Occupational Health and Safety will complete the upgrade after two years of part-time study. Students who wish to enrol in the degree and have an Associate Diploma or Certificate IV will be required to complete the same units as for the Diploma to Degree upgrade, the project (Diploma Conversion) and may be required to complete some units from the Faculty of Business.

**Course Structure**

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<th>Credit points</th>
<th>Semester</th>
<th>One</th>
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Level 3 Subjects required to upgrade from Diploma in Health Occupational Health and Safety to Bachelor of Science in Occupational Health and Safety

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Additional Subjects for Level 2 – Associate Diploma Occupational Health and Safety Graduates upgrading to Bachelor of Science in Occupational Health and Safety:

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<td>Human Relations</td>
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*Unit to articulate from an Associate Diploma of Science in Occupational Health and Safety or Certificate IV in Health Occupational Health and Safety to a Diploma of Science in Occupational Health and Safety.

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**Bachelor of Science (Honours) in Biology (Biotechnology)**

*Course Code: SHBT*

**Bachelor of Science (Honours) in Conservation Biology and Environmental Management**

*Course Code: SHAB*

**Bachelor of Science (Honours) in Nutrition and Food Science**

*Course Code: SHFT*

**Course Objectives**

An Honours program is available in each of the degree specialisations. The aim of the honours program is to provide a course of advanced study at a fourth year level which builds on the knowledge and skills developed at degree level, and to prepare students for postgraduate research by developing skills in: working independently, critical analysis of information, problem-solving, devising, designing and conducting experimental work and written and oral communication.

**Admission Requirements**

To qualify for entry to the honours program, applicants must hold a degree or equivalent with major studies in a relevant discipline and should normally have obtained a ‘credit’ average, or equivalent, in the final year of the degree.

**Course Duration**

The courses are offered on a full-time basis over one year or equivalent if on a part-time basis. Entry to the Honours program for the Conservation Biology and Environmental Management specialisation can be either at the beginning of the academic year (February) or at a mid-year intake (July) to allow for field-based research with seasonal limitations.

**Course Structures**

The structure of these three honours courses is as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Science Honours</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBF4000</td>
<td>Science Honours</td>
<td>120 (60 per semester)</td>
</tr>
</tbody>
</table>

The course consists of advanced coursework and a research thesis. Assessment will be based on written assignments, seminar presentations, a written examination and the research thesis.

Coursework assessment will be based on seminar presentations, written assignments and examination.

**Bachelor of Science (Honours) in Biomedical Sciences**

*Course Code: SHBM*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Science Honours</th>
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</thead>
<tbody>
<tr>
<td>SBM4000</td>
<td>Science Honours</td>
</tr>
</tbody>
</table>
At the conclusion of the Honours program a student will have:

1. been exposed in a formal manner to the factors which impinge on the design, conduct and evaluation of a research project and will have demonstrated through oral and written presentations an understanding of these factors;
2. been exposed to three areas of advanced knowledge and will have demonstrated an understanding of these areas through oral or written presentations or other assessment tasks;
3. demonstrated through oral presentation an ability to draw together various pieces of information and experimental data into a comprehensive research proposal;
4. conducted an experimental program designed to elucidate information related to the research proposal and demonstrated by the presentation of a written thesis and an oral presentation the ability to design experiments, to collect and analyse experimental data and to draw and present conclusions appropriate to the data.

Bachelor of Science (Honours) in Chemical and Environmental Sciences

Course Code: SHCB

This course will develop the student's skills in areas associated with research methodology, including the ability to devise and design experiments intended to yield data relevant to the solution of a specific problem, the ability to analyse data critically in order to focus the direction of further experimentation, the ability to develop and refine working hypotheses, and the ability to report results in an appropriate manner. Additionally, the course will expand knowledge into more advanced areas of chemistry and biology.

At the conclusion of the Honours program a student will have:

1. been exposed to three areas of advanced knowledge and will have demonstrated understanding of these areas through oral or written presentations or other assessment tasks;
2. demonstrated through oral presentation an ability to draw together various pieces of information and experimental data into a comprehensive research proposal;
3. conducted an experimental program designed to elucidate information related to the research proposal and demonstrated by the presentation of a written thesis and an oral presentation the ability to design experiments, to collect and analyse experimental data and to draw and present conclusions appropriate to the data.

Research Project

The major piece of work is a research project conducted on a full-time basis for two semesters. The enrolment code associated with the research project is SCS4600 Honours Research Project. The results of the research project will be reported in a thesis of approximately 8000–10,000 words; the thesis will be submitted towards the end of November.

Oral Presentations

Two oral presentations will be involved in the Honours program. At the conclusion of Semester 1 each student will give the Initial Oral Presentation; this presentation will place the research project in context and give a detailed description and justification of the research plan. The project examiners will give each student feedback after the Initial Oral Presentation. At the end of Semester 2 each student will give the Final Oral Presentation; this presentation will report results of the research project and outline any conclusions drawn. The Final Oral Presentation will be held approximately one week after the deadline for submission of the thesis.

Coursework

Four pieces of coursework are involved in the Honours program:

**HPG6010 Research Design**

This is a one-semester subject involving 5 hours/week of contact. It is a generic research design subject taught by the Department of Physical Education and Recreation in both Semester 1 and Semester 2.

**SCS4201 Honours Coursework**

There are three separate items of coursework associated with this enrolment code. The three items will be chosen from a list similar to the following:

- Application of NMR Spectroscopy in the Study of Muscle Metabolism
- Physiological and Metabolic Aspects of Rowing
- Micro-Column Separations
- Inductively Coupled Plasma (ICP)
- Spectrophotometry
- Structure-Property Relationships of Polymeric Materials
- Turning up the Heat: Thermal Methods of Analysis
- Characterisation of Materials – A Survey of Methods
- Atomic Spectroscopic Analysis
- Solvent Extraction of Metal Chelates
- Kinetics of Solvent Extraction
- Reaction Mechanisms in Organic Chemistry
- A single muscle fibre approach to the study of muscle biochemistry
- Gas-Liquid Chromatography

The form of each item (nature of activity, type of assessment, etc.) will vary and it will be necessary to discuss the content of items of interest with staff members concerned. The deadline for completion of this coursework is the beginning of semester two. The assessment of each piece of coursework is the beginning of semester two. The assessment of each piece of coursework will be carried out by the staff member concerned. As a rough guide, the load associated with each element of SCS4201 will be similar to that of a one-semester subject involving 1–2 hours/week of contact.

Project Supervisors

The research project supervisor(s) will be appointed at the time of enrolment. The project supervisor(s) will advise the student on the conduct of the research program and contribute towards the assessment of the Project Thesis.

Project Examiners

Two examiners, neither of whom will be a project supervisor, will be appointed prior to the Initial Oral Presentations. The examiners will assess both the Initial and Final Oral Presentations and contribute towards the assessment of the Project Thesis. The examiners will provide each student with written comments following the Initial Oral Presentation.

Assessment

The proportion of assessment associated with each part of the Honours program is as follows:

Credit
Diploma of Meat Management

(This course is offered on a fee-paying basis)

Course Objectives

This course is a fee-for-service course designed specifically for the Australian Meat Industry.

The objective of the course is to provide meat industry personnel in management positions with the necessary managerial and technological knowledge and skills to successfully embrace future changes in managerial, technological and marketing aspects of the industry.

Admission Requirements

To qualify for admission to the course, an applicant must normally meet the following requirements:

- be currently employed in the meat processing industry and have at least three years of relevant experience;
- have completed a year 12 course of study or qualify for entry as a mature age applicant with relevant industry experience;
- have the support of his/her employer to undertake the course; and
- preferably be associated with the Australian Meat Industry.

Course Duration

The course is offered over three years of part-time study comprising six 5-week periods of formal coursework of approximately 30 hours per week, coupled with an industry-based project in each of the three years.

Course Structure

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Credit</th>
<th>points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBF0111 Introductory Management Skills</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>SBF0122 The Australian Meat Industry</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>SBF1110 Industry Project</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SBF1111 Introductory Meat Technology</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>SBF1120 Meatworks Engineering Services</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Credit</th>
<th>points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBF0213 Management of Employees</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>SBF2110 Meat Processing</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SBF2120 Industry Project</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SBF2121 Principles of Meat Science</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>
Undergraduate Subject Details

Subject details are listed in alphanumeric order. Subjects are taught by schools/departments according to the following codes:

ACE Humanities
BAO Accountancy and Law
BEO Applied Economics
BMA Management
EC/EM/EZ Built Environment
EE/SCA/SCM/SPH Communications and Informatics
EP Packaging
EQ Environmental Safety and Risk
Engineering
SBF/SBM/SCS Life Sciences and Technology

Language and Communication Subjects

Language and Communication subjects are offered at three levels. They are:

Australian English: offered as a preliminary subject designed for students who are not sufficiently competent in English to successfully undertake a mainstream communication subject.

Language and Communication: a core unit consisting of either a one-semester subject or a two-semester subject with necessary variations tailored to the requirements of varying course structures.

Professional Communication: a subject focusing on the preparation and the delivery of a major written and oral report as well as employment preparation for final year students.

ACE 1010 WRITTEN AND ORAL COMMUNICATION 1

Campus Footscray Park
Prerequisite(s) Nil
Content This subject is designed to provide students with written and oral communication skills necessary for their academic studies in science and future employment. Skills include listening and note-taking, reading and summarising, researching and referencing information, writing reports and making oral presentations. These skills are applied in writing memos, memo reports and a major report. Students are required to complete class exercises and oral presentations. Use of clear, concise language in written and spoken contexts is emphasised.

Required Reading Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science.

Class Contact Two hours per week for one semester.

Assessment Progressive assessment of written work comprising exercises and tests. Examinations and tests, 40%; Reports, 30%; Oral Presentations, 30%. Students must demonstrate the ability to use correctly the conventions of the English language in class exercises, tests and the major written report. Students are expected to attend at least 80% of classes.

ACE 1141 ENGLISH LANGUAGE AND COMMUNICATION 1

Campus Footscray Park
Prerequisite(s) Nil
Content This is a preliminary subject, which is designed to enable students who are not sufficiently competent in English to successfully undertake a mainstream 'communication' subject. In the second semester English language skills will be further extended and reinforced. The subject specifically aims to: increase student's proficiency in communicating in Australia, both orally and in writing, at an academic/professional level; enable students to achieve acceptable pronunciation and fluency in English; make students aware of correct study skills: listening and note-taking; increase students' understanding and use of Australian English vocabulary; develop students' writing abilities by studying various kinds of writing; increase students' understanding of Australian society by concentrating on specific social themes. Students will be required to attend seminars and complete the exercises prescribed, including weekly class exercises, completion of prescribed reading, summaries and critiques oral presentation and demonstration.

Required Reading Murphy, Raymond, 1994, *English Grammar in Use*, Cambridge, CUP


Class Contact Two hours per week for one semester.

Assessment Final Examination 30%; Summary 20%; Continuous class and homework exercises 20%; two oral presentations 20%; aural summary 10%.

ACE 1142 ENGLISH LANGUAGE AND COMMUNICATION 2

Campus Footscray Park
Prerequisite(s) ACE1141 English Language and Communication 1
Content This preliminary subject, which is designed to enable students who are not sufficiently competent in English to successfully undertake a mainstream 'communication' subject. The subject specifically aims to: increase student's proficiency in communicating in Australia, both orally and in writing, at an academic/professional level; enable students to achieve acceptable pronunciation and fluency in English; make students aware of correct study skills: listening and note-taking; increase students' understanding and use of Australian English vocabulary; develop students' writing abilities by studying various kinds of writing; increase students' understanding of Australian society by concentrating on specific social themes. Students will be required to attend seminars and complete the exercises prescribed, including weekly class exercises, completion of prescribed reading, summaries and critiques oral presentation and demonstration.

Required Reading Murphy, Raymond, 1994, *English Grammar in Use*, CUP, Cambridge


Class Contact Two hours per week for one semester.
Assessment: Final Examination 30%; Written Report 20%; Synthesis 15%; aural test 10%; oral presentation 15%; continuous class and homework exercises 10%.

ACE 1500 ENGINEERING COMMUNICATION
Campus: Footscray Park
Prerequisite(s): Nil
Corequisite(s): EEE1412 Experimental Studies 1.2 or EZX1410 Experimental Studies
Content: This communication subject has been designed in the context of engineering. The skills of note-taking, summarising, synthesising, researching, report writing, manual and instruction writing, oral presentation, and debating are taught within this context. Class materials, exercises and assessment tasks have been developed collaboratively by CLACS and Engineering lecturers.
Required Reading: Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science, 2002, Faculty of Arts, Victoria University or as advised by lecturer.
Class Contact: Two hours per week for two semesters.
Assessment: All assessment tasks must be attempted and students are expected to attend at least 80% of classes. Examinations and tests, 40%; Reports, 30% including research and laboratory reports; Oral presentations, 30% including debates and poster presentations.

ACE 1110 ENGINEERING COMMUNICATION FOR NON NATIVE SPEAKERS OF ENGLISH (NNSE)
Campus: Footscray Park
Prerequisite(s): Nil
Corequisite(s): EEE1412 Experimental Studies 1.2 or EZX1410 Experimental Studies.
Content: This communication subject has been designed in the context of engineering. The skills of note-taking, summarising, synthesising, researching, report writing, manual and instruction writing, oral presentation, and debating are taught within this context. Appropriate teaching methodologies for students with English as a Second Language will be applied in the teaching of this subject. Selection will be based on a language skills assessment test taken during the orientation program.
Required Reading: Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science, 2002, Faculty of Arts, Victoria University, or as advised by lecturer.
Class Contact: Two hours per week for two semesters.
Assessment: All assessment tasks must be attempted and students are expected to attend at least 80% of classes. Examinations and tests, 40%; Reports, 30% including research and laboratory reports; Oral presentations, 30% including debates and poster presentations.

ACE 1910 COMMUNICATIONS FOR SCIENCE
Campus: St Albans, Werribee
Prerequisite(s): Nil
Content: Semester One: This subject is designed to provide students with written and oral communication skills necessary for their academic studies in science and future employment. Skills include listening and note-taking, reading and summarising, researching and referencing information, writing reports and making oral presentations. These skills are applied in writing memos, memo reports and a major report. Students are required to complete class exercises and oral presentations. Use of clear, concise language in written and spoken contexts is emphasised. Semester Two: This subject develops and builds upon language and research skills acquired in semester one and introduces students to further communication skills including letter writing, preparation of letters of application and resumes, interview techniques and use of libraries and other research tools. Students are required to research a topic in the science field and present a written and oral report.
Required Reading: Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science.
Class Contact: Two hours per week for two semesters, comprising lectures and tutorial/workshop.
Assessment: Progressive assessment of written work comprising exercises and tests, Examinations and tests, 40%; Written exercises, 30%; Oral assessment, 30%. Students must demonstrate the ability to use correctly the conventions of the English language in class exercises, tests and the major written report. Students are expected to attend at least 80% of classes.

ACE 2010 WRITTEN AND ORAL COMMUNICATION 2
Campus: Footscray Park
Prerequisite(s): ACE1010 Written and Oral Communication 1.
Content: This subject develops and builds upon language and research skills acquired in ACE1010 and introduces students to further communication skills including letter writing, preparation of letters of application and resumes, interview techniques and use of libraries and other research tools. Students are required to research a topic in the science field and present a written and oral report.
Required Reading: Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science.
Class Contact: Two hours per week for one semester.
Assessment: Progressive assessment of written work comprising exercises and tests, 40%; major written report (1500 words), 40%; oral presentations, 20%. Students must demonstrate the ability to use correctly the conventions of the English language in class exercises, tests and the major written report. Students are expected to attend at least 80% of classes.

ACE 2910 PROFESSIONAL COMMUNICATION
Campus: Footscray Park
Prerequisite(s): Nil.
Content: This subject is designed to enable students to communicate effectively in a variety of media at a professional level, and to understand the social context influencing their communications. The coursework will be integrated into the context of the students’ scientific study. On completion of this subject, students should have: developed an understanding of and a proficiency in a variety of skills appropriate to tertiary study; and acquired an awareness of their role as communicators in a technological age. Coursework will include: the nature of communication; written communication skills, technical and scientific writing, including reports; oral communication, oral reports and debates; study skills, reading, note-taking and editing; research skills, library research and bibliographic format; employment preparation, preparing a resume and letters of response to position descriptions; document production.
Class Contact: Two hours per week for two semesters.
Assessment: Progressive assessment of written work comprising exercises and reports, 50%; major written and oral presentations, 50%. All assignments must be attempted in order to qualify for assessment in this subject. Regular class attendance is expected.
ACE3010 WRITTEN AND ORAL COMMUNICATION 3

Campus Footscray Park

Prerequisite(s) ACE1010 Written and Oral Communication 1 and ACE2010 Written and Oral Communication 2 or ACE1910 Communications for Science.

Content This subject develops and builds upon language and research skills acquired in ACE1010 and ACE2010. Students are required to research and present a formal report of 3000 words on a topic approved by the School of Life Sciences and Technology. The report must be professionally presented and meet technical report writing requirements. A preliminary report must be submitted in first semester and the final report submitted at the end of second semester. Oral communication focuses on presentation of the written report in a formal setting to an audience of students and staff.

Required Reading Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science.

Recommended Reading Silyn Roberts, H., 1996, Writing for Science, Longman, NZ.

Class Contact One hour per week for two semesters.

Assessment Preliminary written and oral report, 30%; final report and oral presentation, 70%. Students are expected to attend 80% of classes.

ACE3020 WRITTEN AND ORAL COMMUNICATION 3 (PART-TIME)

Campus Footscray Park

Prerequisite(s) Three years of approved experience in a chemical or related industry.

Content This subject is designed to assist students to develop professional communication skills. Students are required to research and present a formal report of 5000 words on a topic approved by the School of Life Sciences and Technology. The report must be professionally presented and meet technical report writing requirements. A preliminary report must be submitted in first semester and the final report submitted at the end of second semester. Oral communication focuses on presentation of the written report in a formal setting to an audience of students and staff.

Required Reading Handbook of Communication Skills for First Year Students in the Faculty of Engineering and Science.

Recommended Reading Silyn Roberts, H., 1996, Writing for Science, Longman, NZ.

Class Contact Two hours per week for two semesters.

Assessment Preliminary written and oral report 30%; final report and oral presentation 70%. Students are expected to attend at least 80% of classes.

ACE3143 ENGLISH LANGUAGE AND COMMUNICATION 3

Campus Footscray Park, Malaysia

Prerequisite(s) ACE1142 English Language and Communication 2 or Year 12 English or competence in English.

Content This subject is designed to provide students with written and oral communication skills necessary for their academic studies and future employment. Skills include listening and note-taking, reading and summarising, locating and accessing information sources, writing reports and making oral presentations. Students apply these skills to a research project and learn how to plan, draft write and edit a research report. Students will present their research findings to an audience. Emphasis is given to the conventions of the English language – grammar, syntax and vocabulary – and to clear writing in a range of contexts. Preliminary preparation for employment is included.


Recommended Reading Eunson, B., 1994, Writing Technical Documents, John Wiley, Queensland

Class Contact Three hours per week for one semester.

Assessment Preliminary written and oral presentations, 70%; Final Oral presentation 20%, Employment Preparation 30%. Written Report (1500-2000 words) 20%, Class Exercises 30%.

ACE3144 ENGLISH LANGUAGE AND COMMUNICATION 4

Campus Footscray Park, Malaysia

Prerequisite(s) ACE3143 English Language and Communication 3.

Content This subject builds on language and research skills acquired in previous subjects and introduces students to work related skills including job applications, resumes, interview techniques, interpersonal skills, small group communication, writing and speaking professionally. Students continue their research project and present their findings in a written report and oral presentation. Students use word processing skills and current software to produce a professional standard in both written and oral presentations.


Recommended Reading Eunson, B., 1994, Writing Technical Documents, John Wiley, Queensland

Class Contact Three hours per week for one semester.

Assessment Test, 20%; Orals, 40%; Employment preparation, 20%; Project report (1500-2000 words), 20%.

BAO101 ACCOUNTING FOR DECISION MAKING

Campus Footscray Park, Sunbury, Werribee, Kuala Lumpur, Hong Kong.

Prerequisite(s) Nil.

Content The objectives of the subject are to provide a basis for further accounting studies, yet meet the needs of students from other areas of business studies; to introduce students to basic accounting concepts and selected accounting practices; and to introduce students to the role of, and the processes involved in planning and decision making within the business environment. Topics include: introduction to the roles of accounting management planning and decision making; accounting concepts; cash and accrual accounting; preparation of financial statements; forms of business ownership, and effect on financial statements; budgeting – an introduction; budgets; control and performance reports; analysis and interpretation; evaluation of performance; the operating cycle; short term decision making and cost behaviour.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Final examination, 70%; internal assessment, 30%. Students are expected to satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.
BAO9301 ACCOUNTING FOR BUSINESS DECISIONS
(ENGINEERING AND SCIENCE SERVICE SUBJECT)
Campus Footscray Park.
Prerequisite(s) Nil.
Content This subject explores the relationship between accounting and business decision making by management. Basic financial accounting, costing and management accounting.
Required Reading To be advised by lecturer.
Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.
Assessment Continuous assessment, 20%; final examination, 80%. Students are expected to satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BAO9913 ACCOUNTING INFORMATION SYSTEMS
(ENGINEERING AND SCIENCE SERVICE SUBJECT)
Campus Footscray Park.
Prerequisite(s) Nil.
Content The subject aims to introduce students to the language and concepts of accounting and to the provision of financial information to meet user requirements. Topics include: introduction to the uses and users of accounting information; the presentation and interpretation of accounting reports; provision of information for business management; basic decision making and financial planning.
Required Reading To be advised by lecturer.
Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law.
Assessment Test and assignment, 30%; final examination, 70%. Students are expected to satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BBF3312 ENVIRONMENTAL LEGISLATION AND ECONOMICS
(ENGINEERING AND SCIENCE SERVICE SUBJECT)
Campus Footscray Park
Prerequisite(s) Nil.
Content Introduction to law, types of legislative enactments and the Australian court system. Applications of acts, regulations and other laws and policies to development proposals, managerial responsibilities and environmental protection. Overview of relevant provisions of a range of environment-related legislation.
Required Reading To be advised by lecturer.
Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law.
Assessment Assignments, 30%; examination, 70%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BCS9110 INTRODUCTORY COMPUTING
(ENGINEERING AND SCIENCE SERVICE SUBJECT)
Campus Werribee.
Prerequisite(s) Nil.
Content This introductory subject aims to give students a broad insight into the use and application of computers in the sciences. Topics covered include: computer systems, hardware and software, word processing, spreadsheets, databases, data communications, artificial intelligence, computers as a research tool, social implications of computing.
Required Reading To be advised by lecturer.
Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law.
Assessment Practical work, 50%; examination, 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.
BCO 1101 COMPUTER APPLICATIONS

Campus Footscray Park, Sunbury, Werribee, Kuala Lumpur, Hong Kong.

Prerequisite(s) Nil.

Content Computer systems hardware and software; word processing; graphics; spreadsheets; database management systems; overview of programming languages and program design; data communications; concepts of business information systems; social issues.

Required Reading To be advised by lecturer.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules; or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Semester assessment, 40%; final examination and test(s) 60%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BE 1003 MICROECONOMIC PRINCIPLES

Campus Footscray Park, Sunbury, Werribee, Kuala Lumpur, Hong Kong.

Prerequisite(s) Nil.

Content This is the first of two Economic Principles subjects. The subject aims to provide a study of basic economic principles, to develop an introduction to economic methods, and to apply these principles and methods to aspects of the Australian economy. Topics include: introduction to economics, nature, method and objectives of economics; the economising problem, relative scarcity, production possibilities, opportunity costs, nature of economic resources; the market economy, demand and supply, theory and applications, including pricing ceilings, price floors, tariffs, taxes, and the labour market; consumer theory; theory of the firm, production and costs; introduction to market structure conduct and performance; price determination in perfect and imperfect competition; workable competition and competition policy in Australia; alternative theories of the firm; market imperfections.

Required Reading To be advised by lecturer.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules; or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Continuous assessment, 50%; examination, 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BE 1004 MACROECONOMIC PRINCIPLES

Campus Footscray Park, Sunbury, Werribee, Kuala Lumpur, Hong Kong.

Prerequisite(s) BEO1103 Microeconomic Principles.

Content This subject aims to develop the basic macroeconomic principles applicable to the Australian economy and familiarise students with the macroeconomic environment within which Australian business operates. Topics include: the measurement of macroeconomic performance with reference to national income accounting and trade cycle analysis; the classical economic model and the Keynesian revolution; Keynesian economics and the theory of income determination; monetary influences on aggregate economic activity; inflation, unemployment; traditional demand management; the Phillips Curve revisited; interflation; incomes policies; the foreign trade sector and policies for external balance.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules; or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Continuous assessment, 50% examination, 50%. Students are expected to satisfactorily complete each component of assessment to gain a pass in the subject. Supplementary assessment will not be available. NOTE: Any hand-held calculator may be used in examinations.

BE 1006 BUSINESS STATISTICS

Campus Footscray Park, Sunbury, Werribee, Kuala Lumpur, Hong Kong.

Prerequisite(s) Nil.

Content This subject enables students to acquire the skills and techniques required to analyse data in a business environment. Topics include: introduction to statistics; descriptive statistics; introduction to probability and probability distributions; normal probability distribution; sampling distributions and parameter estimation; hypotheses testing; simple linear regression and correlation; time-series analysis and forecasting; index numbers. Use will be made of a statistical computer package.

Required Reading To be advised by lecturer.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules; or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Case work(ies); study(ies); assignment(s), 40%; final examination, 60%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BE 090101 FUNDAMENTAL OF BUSINESS (ENGINEERING AND SCIENCE SERVICE SUBJECT)

Campus Footscray Park.

Prerequisite(s) Nil.

Content The subject provides students with an introduction to business concepts. It examines the relationship between the components of business and develops an appreciation of the structure, goals, operations and decision making processes within business. Business Trends and the Economic Environment:
trends affect business; economic issues affecting business; social responsibility of business. Business Formation: forms of business organisation; small business management. Marketing Fundamentals: marketing principles; marketing objectives; marketing mix; product development and pricing; distribution, wholesale and retail. Management: management and leadership; production and operations management; management and public relations; information technology; computers and other business aids, risk management. Management and Human Resources: motivation; human resource management; industrial relations; legislation and human resource management; employee-management issues-multiple-skilling, technology and work practices, comparable worth. Accounting and Finance: money and skills; sources of business funds; accounting and financial management; shares and bonds; personal financial planning. Quantitative Aids for Management; accounting analysis; budgeting and forecasting; statistical analysis, spreadsheets. Law and Business: business law and ethics.

**Required Reading** To be advised by lecturer.

**Class Contact** Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment** Seminar assignments, 50%; final examination, 50%.


**Course Content** Tuning in to one's experience; communication skills; forming relationships; assertion and personal rights; influence and persuasion; dealing with emotions; personal presentation skills.


**Course Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment** Assignments, tests, and reflective journals, 100%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

**BLO1105 BUSINESS LAW**

**Campus** Footscray Park.

**Prerequisite(s)** Nil.

**Course Content** This subject aims to provide students with an understanding and awareness of the basic principles of Contract Law, a familiarity with relevant case law and an introduction to the statutory provisions pertinent to the course. The instructional methodology is also aimed at providing students with a format from which they may develop an understanding of legal reasoning as it applies to the analysis of contractual relationships.

**Required Reading** Eaglebook, *Jobs and the Law*, CCH.

**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment** Class tests and assignments. Supplementary assessment will not be available.

**BLO2158 INTRODUCTION TO LAW**

**Campus** Footscray Park.

**Prerequisite(s)** Nil.

**Course Content** Sources of law, the Australian Constitution, the parliamentary process, contract law and contracts of employment, natural justice and civil rights, arbitration and conciliation. To introduce the sources and role of law as it applies to workers and to trade union members. To develop an understanding of the functions of law with regard to the rights of workers and an understanding of those rights. To show the link between the rights of workers and rights of people in the broader community.

**Required Reading** Eaglebook, *Jobs and the Law*, CCH.

**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment** Class tests and assignments. Supplementary assessment will not be available.

**BLO2207 EMPLOYMENT LAW**

**Campus** Footscray Park, Sunbury, Werribee.

**Prerequisite(s)** BLO1105 Business Law.

**Course Content** The subject will address the need for informing and challenging students to develop knowledge and skills in the area of Employment Law. Topics include: an introduction to Australian labour law; the sources of Australian employment law; the nature of the employment relationship; the content of the contract of employment, express terms, implied terms; recruitment and limits of managerial control over hiring; termination and remedies at common law; statutory remedies for arbitrary termination; preventative legislation; discrimination in employment; occupational health and safety issues; reforming the system.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment** Assignments and class work, 50% final examination, 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

**BLO4511 BUSINESS LAW AND STRUCTURE**

**Campus** Footscray Park.

**Prerequisite(s)** Nil.
Content This subject is designed as an introduction to the Australian legal system for students who may receive no further formal legal training. Initial lectures briefly outline the sources of law, the concept of precedent, the Commonwealth and State of Victoria Constitutions and the judicial system. In the major portion of the subject students will learn the specialised art of legal reasoning, an analytical tool common to all branches of the law; through the study of the law of contracts. Finally, particular matters of interest to students in their roles as engineers and citizens will be dealt with, such as professional liability for negligence, purchase of real property and sale of goods.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law.

Assessment The method of assessment will be announced at the commencement of the semester. Supplementary assessment will not be available.

BMO1102 MANAGEMENT AND ORGANISATION BEHAVIOUR

Campus Footscray Park, Sunbury, Werribee, Kuala Lumpur, Hong Kong.

Prerequisite(s) Nil.

Content The aims of this subject are to provide students with an understanding of organisational behaviour and management theory; to assess critically the underlying values of these theories; to assess critically the utility and application of the management practices informed by these theories in the Australian context; and to analyse critically the values of Australian managers concerning behaviour in organisations and to evaluate the effectiveness of these assumptions. This subject includes the following topics: overview of the development of organisation/management theory; analysis of scientific management, human relations theory; individual behaviour/perception, personality, learning, motivation; group behaviour: group dynamics, conflict resolution, leadership, concentrating on Australian case studies and incorporating a consideration of issues of gender, ethnicity and age; applications of management/organisation theory in Australia; communication processes, and quality of working life.

Required Reading To be advised.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Class presentation, 15%; major assignment, 25%; tutorial presentation and report, 20%; final examination, 40%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BMO3177 ORGANISATION BEHAVIOUR

Campus Footscray Park.

Prerequisite(s) Nil.

Content An introduction to organisation behaviour; the processes underlying behaviour and its consequences within organisation; practical behavioural skills which contribute to the formulation, implementation and evaluation of effective work practices; the methods and the need of investigation in behavioural studies, the nature of the person, the various capacities of people and some approaches in the study of a person, the relationship between the person and the organisation, identifying various managerial roles such as leadership and power, their use and misuse.


Class Contact Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Tutorial presentation and report, 20%; participation, 10%; multiple choice test No. 1, 20%; multiple choice test No. 2, 20%; major assignment, 30%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BMO3220 HUMAN RESOURCE MANAGEMENT

Campus Footscray Park Sunbury.

Prerequisite(s) BMO1102 Management and Organisation Behaviour.

Content The aim of this subject is to introduce the principal components of the human resource management function; and to examine the links between the effective utilisation of human
resources and overall organisational effectiveness. This subject includes the following topics: overview of personnel and human resource management; influences on HRM function, recruitment, selection, orientation, equal employment opportunity and affirmative action, motivation, job design, performance appraisal and training and career development; total compensation, employment relations, OHS and developments and research in Human Resource Management.

**Required Reading** To be advised by lecturer.

**Recommended Reading**

- *Campus, Sunbury.*
- *Footscray Park,* Sunbury.

**Assessment**

- Group case study and report 35%; individual presentation 10%; mid-semester test 15%; final examination 40%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

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**BMO3351 WORKPLACE INDUSTRIAL RELATIONS**

**Campus** Footscray Park, Sunbury.

**Prerequisite(s)** BMO1102 Management & Organisation Behaviour or equivalent.

**Content** The aims of this subject are to develop a critical understanding of the interaction between management, employees and unions at the workplace. Topics include strategic employee relations policies and practices; consultative processes; unions at the workplace; women workers and affirmative action; workplace bargaining; grievance handling; and negotiation skills and practice.

**Recommended Reading** To be advised by lecturer.

**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**

- Group presentations 30%; project 10%; individual presentation 10%; mid-semester test 15%; final examination 40%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

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**BMO3476 TRAINING AND DEVELOPMENT**

**Campus** Footscray Park, Sunbury.

**Prerequisite(s)** BMO3220 Human Resource Management

**Content** The aims of this subject are to provide students with an understanding of the theory and practice of training and development; to assess critically the effectiveness of adult learning principles and training and development techniques; to enable students to develop knowledge and skills with regard to the design, management and evaluation of training and development; and to enable students to analyse the training needs of individuals and to design an appropriate development program. This subject includes the following topics: the importance of training for organisational effectiveness and individual career development; training productivity and quality of worklife; training needs analysis and skills audit and job analysis; computer assisted and managed learning; selling, training and development programs within an organisation.

**Recommended Reading** An extensive reading list is handed to students at the beginning of the semester.

**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**

- Group presentations 20%; syndicate group project 30%; final examination 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

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**BMO3522 ENGINEERS AS MANAGERS**

**Campus** Footscray Park.

**Prerequisite(s)** Nil.

**Content** Developing process models, analysing process purpose; measuring process purpose; measuring process performance; feedback and corrective action; motivating for process improvement; alternative approaches to process improvement, total quality management. The role of the engineer from both the customer/systems perspective and the innovation/improvement perspective.

**Recommended Reading**

- *Tovey, M.D. 1997, Change at Work: The 1995 AWIRS Survey*, Longmans, Melbourne.

**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**

- Industry analysis, 20%; group case study, 30%; final examination, 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

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**BMO4512 LABOUR RELATIONS (ENGINEERING SERVICE SUBJECT)**

**Campus** Footscray Park.

**Prerequisite(s)** Nil.

**Content** The aim of this subject is to develop an awareness of employee relations at the macro and workplace level. This subject examines the role of the major institutions of industrial relations.
as well as the nature of workplace relations. Issues covered include the causes, functions and resolution processes of industrial conflict; changing management strategies in industrial relations; the role of equal employment opportunity and affirmative action policies; the nature of union involvement at the workplace; and current issues concerning labour relations.

**Required Reading** To be advised by lecturer.

**Class Contact** Equivalent to three hours per week comprising one two-hour lecture and one one-hour tutorial for one semester.

**Assessment** Written assignment, 30%; class presentations, 20%; final examination, 50%. Students are expected to complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

**BMO4522 INDUSTRY ECONOMICS (ENGINEERING AND SCIENCE SERVICE SUBJECT)**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** This subject will examine how competitive and non-competitive market structures affect the pricing and output decisions of Australian firms. Topics include: market structure, conduct, and performance; market failure; and regulation.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law.

**Assessment** Semester assignments, 50%; final examination, 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

**BMO4551 HUMAN AND INDUSTRIAL RELATIONS (ENGINEERING AND SCIENCE SERVICE SUBJECT)**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** Overview of personnel and human resource management; managing and influencing people; motivation; use of power; management styles; facilitating teams; effective team communication and development; developing and using procedural and operational guidelines; current trends in people management. Major institutions in Australian industrial relations. Nature of workplace relations. The causes, functions and resolution processes of industrial conflict; changing management strategies in industrial relations.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules: or a delivery mode as approved by the Faculty of Business and Law.

**Assessment** Major assignment, 30%; final examination, 70%. Students are expected to complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

**ECA2111 ARCHITECTURAL ENGINEERING DESIGN 1**

**Campus** Footscray Park

**Prerequisite(s)** ACE1500 Engineering Communication.

**Content** Students will complete a series of readings, studio-based exercises and assignments to study the methods of analysis, abstraction, and synthesis in design that are employed in the architectural design of buildings; the basic composition and applied organisational techniques in use; the effects of planning; theories of spatial order and its conceptualisation; and the impact of building materials, technology and the environment in Architectural design.

**Required Reading** Lawson, B., 1994, *Design in Mind*, Butterworth Architecture


**Class Contact** Three hours per week for one semester based on one hour lecture and two hours of tutorials.

**Assessment** Based on a major project and a review of all assignments (which may include tests, class exercises and seminar presentations) set during the semester, to an equivalent of 5000 words.

**ECA2111 ARCHITECTURAL ENGINEERING DESIGN 1**

**Campus** Footscray Park

**Prerequisite(s)** ECA2111 Architectural Design 1

**Content** Eco-philosophy implied in architectural design and its direct consequences for the built environment including sustainability, environmental ethics and ecological impact(s). Concepts of environmentally responsive urban and architectural planning. Examination of energy use in the built environment, impact of ineffective use of energy resources, environmentally responsive strategies for architectural and urban design development. Bio-climatic architecture and its effect on urbanisation.

**Recommended Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester based on one hour lecture and two hours of tutorials.

**Assessment** Based on a major project and a review of all assignments (which may include tests, class exercises and seminar presentations) set during the semester, to an equivalent of 5000 words.

**ECA3312 ARCHITECTURAL HISTORY**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** An introduction to the history of architecture, building construction, urban planning and design, in the context of social, technical and environmental settings.

**Recommended Reading** To be advised by lecturer.

**Class Contact** Four hours per week based on two one hour lectures and two hours of tutorials.

**Assessment** An essay, and a review of all assignments (which may include tests, class exercises and seminar presentations) set during the semester, to an equivalent of 6000 words.

**ECA3413 INDUSTRIAL PLACEMENT**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** An understanding of the role and duties of professionals in the specific area of the building industry where placement has been arranged. An understanding of professional practice in a specific area of the building industry. A deeper
understanding of the building industry via a self directed, self completed project relating to the industry. A favourable exposure (re: skills, knowledge and attributes) to industry as a future graduate in Architectural Engineering.

**Recommended Reading** To be advised by academic mentor and industry based professionals.

**Class Contact** Equivalent to three hours per week.

**Assessment** An individual project from each student to an equivalent of 4000 words.

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**ECA4211 ARCHITECTURAL ENGINEERING DESIGN 2**

**Campus** Footscray Park

**Prerequisite(s)** ECA3211 Architectural Engineering Design 1

**Content** Active/passive thermal environmental control of buildings. Simulation of building thermal performance and natural/artificial illuminated building environments will be employed to optimise total energy consumption level and create visually comfortable spaces. Energy auditing techniques for existing and proposed buildings.

**Recommended Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester based on a one hour lecture and two hours of tutorials.

**Assessment** Assignments (case studies, simulation exercises, class presentations) equivalent to 5000 words and a two hour examination at the end of the semester.

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**ECB3460 PRINCIPLES OF AIR CONDITIONING**

**Campus** Footscray Park

**Prerequisite(s)** ECB2230 Building Thermodynamics.


**Class Contact** Two hours per week for two semesters based on one hour per week of lecture and one hour per week tutorial/laboratory experiments.

**Assessment** Test, assignments and laboratory exercises: 65%, examination: 35%. A pass in each component for each semester is required for a subject pass.

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**ECB3470 LIGHTING AND POWER DISTRIBUTION**

**Campus** Footscray Park

**Prerequisite(s)** EEP2241 Power System Fundamentals 2.1 and EEP2242 Power System Fundamentals 2.2.


**Class Contact** Two hours per week for two semesters based on one hour per week of lectures and one hour per week tutorial/laboratory session.

**Assessment** Assignments, laboratory work, 30%; examinations, 70%.

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**ECB3480 HYDRAULIC SERVICES**

**Campus** Footscray Park

**Prerequisite(s)** EZP2250 Building Fluid Mechanics.

ECB4350 SERVICES DESIGN AND CONSTRUCTION

Campus Footscray Park

Prerequisite(s) ECB4360 Principles of Air Conditioning.


Class Contact Three hours per week in Semester 1 and two hours per week lecture and one hour per week tutorial/labouratory session in Semester 2.

Assessment Assignments: 65%; examination: 35%. A pass in each component for each semester is required for a subject pass.

ECB4360 AIR CONDITIONING SYSTEMS

Campus Footscray Park

Prerequisite(s) ECB4360 Principles of Air Conditioning.

Co-requisite(s) ECB4350 Services Design and Construction.


Class Contact Three hours per week based on two hours per week of lecture and one hour per week tutorial/laboratory session in Semester 1. Three hours per week in Semester 2.

Assessment Assignments and laboratory exercises: 65%; examination: 35%. A pass in each component for each semester is required for a subject pass.

ECB4381 FIRE SERVICES DESIGN

Campus Footscray Park

Prerequisite(s) ECB4380 Hydraulic Services.


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lecture and one hour per week design tutorial session.

Assessment Assignments, tests, project work, 40%; examination, 60%.

ECB4472 COMMUNICATIONS SERVICES

Campus Footscray Park
**ECD3300 CIVIL DESIGN AND PROJECT**

**Prerequisite(s)** ECD3470 Lighting and Power Distribution.

**Co-requisite(s)** ECD4350 Services Design and Construction.

**Content**

**Required Reading** To be advised by lecturer.

**Recommended Reading**

**Class Contact**
Three hours per week for one semester based on two hours per week of lectures and one hour per week tutorial session.

**Assessment**
Assignments, projects, 35%; examination, 65%.

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**ECC110 INTRODUCTION TO COMPUTING**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Corequisite(s)** Nil

**Content**


**Required Reading** Minett, M.W., Introduction to Computing – Lecture Notes for Semesters 1 and 2.


**Class Contact**
Three hours per week for two semesters based on one hour lecture, two hours tutorial/laboratory session.

**Assessment**
Assignments and laboratory exercises: 40%, laboratory examination: 60% for both semesters.

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**ECD3300 CIVIL DESIGN AND PROJECT**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite(s)** ECF3450 Hydrologic Processes; ECG3260 Geomechanics A; ECT3440 Transportation Engineering.

**Content**
Semester one: Typically three design exercises of about twelve hours each as follows – pipeline and pumping system design, geometric design of a rural road, urban stormwater drainage design. Other design projects of similar duration may be substituted from time to time as appropriate. Semester two: Typically three design exercises of about twelve hours each as follows – flood and retarding basin design; geotechnical elements of a landfill including earthworks, slope stability and liner system; design and analysis of a signalised intersection. Other design projects of similar duration may be substituted from time to time as appropriate.

**Required Reading** To be advised by lecturer.

**Recommended Reading**
As for the co-requisite subjects above.

**Class Contact**
Three hours per week of design sessions for two semesters.

**Assessment**
Short written and oral assignments, 25%; design reports 75%.

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**ECD4332 CIVIL ENGINEERING DESIGN**

**Campus** Footscray Park

**Prerequisite(s)** ECG2260 Earth Science.

**Co-requisite(s)** ECF4450 Hydrologic Processes; ECT3440 Transportation Engineering.

**Content**
A series of four design exercises of about nine hours each week contact time as follows: design elements of a town water supply system, design elements of a town wastewater management system, hydrologic and other design aspects of a reservoir, and design (or raising) of a small earth dam.

**Required Reading** To be advised by lecturer.

**Recommended Reading**
As for the three co-requisite subjects above.

**Class Contact**
Three hours per week for one semester based on tutorial/design format.

**Assessment**
Design reports, 100%.

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**ECD4400 CIVIL ENGINEERING PROJECT**

**Campus** Footscray Park

**Prerequisite(s)** Third year subjects relevant to the project chosen.

**Co-requisite(s)** Fourth year subjects relevant to the project chosen.
Content Students will work in small groups (usually two to four persons per group) to carry out a major project on investigation and/or design in one or more of the following areas: structures, building services, construction management, hydraulic engineering, environmental engineering, roads and transport, or geotechnical engineering. Design projects are normally chosen from recent, current or proposed real-world projects, while investigation projects are devised to assist industry to obtain solutions to defined problems. Close contact with relevant industry bodies and consulting engineers is sought for most projects. In semester one students are introduced to work related skills including job applications and interview techniques.

Required Reading To be advised by lecturer.

Recommended Reading To be advised by individual project supervisors.

Class Contact Semester one Four hours per week based on a lecture/laboratory/tutorial format. Semester two: Three hours per week based on a laboratory/tutorial format.

Assessment Students will be assessed individually based on oral and written presentations and on initiative and work carried out through the year. Oral presentation, 15%; written report, 80%; poster presentation, 10%.

ECD4490 BUILDING ENGINEERING PROJECT

Campus Footscray Park

Prerequisite(s) Third year subjects relevant to the project chosen.

Co-requisite(s) Fourth year subjects relevant to the project chosen.

Content Students will work in small groups (2 to 4 persons per group) to carry out a major project on one or more of the following areas: Structures, building services, construction management, hydraulic engineering, environmental engineering, roads and transport, or geotechnical engineering. Each project will involve an element of research and is encouraged to be unique. Close contact with relevant industry bodies will be encouraged. The projects will be closely supervised by a lecturer.

Required Reading To be advised by lecturer.

Recommended Reading To be advised by individual project supervisors.

Class Contact Three hours per week for two semesters based on a laboratory/tutorial format.

Assessment Students will be assessed individually based on oral and written presentations and on initiative and work carried out through the year. Oral presentation, 15%; written report, 80%; poster presentation 5%.

ECF3450 HYDROLOGIC PROCESSES

Campus Footscray Park

Prerequisite(s) EZF2210 Fluid Mechanics A

Content Semester one: Review of hydrologic cycle, rainfall/runoff processes, IDF curves. Stream gauging. Peak flow estimation for rural and urban catchments including Rational Formula, unit hydrographs, and statistical methods of flood prediction. Urban drainage system analysis and design using minimum grade and hydraulic grade line methods. Design and aesthetic aspects of urban waterways. Review of basic channel flow hydraulics, gradually varied flow, computer analysis of surface profiles. Semester two: Introduction to unsteady flow, storage and channel routing by graphical and computer (RORB) methods, and hydrologic modelling. Floodplain management, structural/non-structural approaches, design of floodways, levees, culverts and retarding basins. Sediment transport in streams, catchment and stream erosion control measures. Introduction to groundwater hydrology and hydraulics, design construction and testing of wells, recharge and basin yield, groundwater quality. Land degradation and integrated catchment management.


Class Contact Three hours per week for two semesters based on two hours lectures and one hour tutorial.

Assessment Assignments, tests, 30%; examination, 70%.

ECF4450 HYDRAULIC ENGINEERING

Campus Footscray Park

Prerequisite(s) ECF3450 Hydrologic Processes.


Class Contact Three hours per week for two semesters based on two hours per week of lectures and one hour per week of laboratory/tutorial session.

Assessment Assignments, tests, 25%; end-of-semester examinations, 75%.

ECG2260 EARTH SCIENCE

Campus Footscray Park

Prerequisite(s) Nil.

Co-requisite(s) ECS2221 Materials and Structures.

Content Semester one: Origin of rocks; basic geological processes; stratigraphy; surficial geology maps; geology of Melbourne. Formation and transportation of soils; classification, description and engineering properties of soil and rock. Phase relationships.
Clay behaviour. Gravitational stresses in the ground; principle of effective stress. Permeability; seepage of water through soil; flow nets. Compaction of soils and crushed rock, including methods, specification and field evaluation. Site exploration, including desk study, pit and boring methods, logging and reporting; vane shear test and Standard Penetration Test. Introduction to shear strength; drained and undrained triaxial tests; direct shear; strength parameters. Semester two: Bearing capacity of shallow foundations on fine and course-grained soils. Geomorphology, including tectonic processes and evolution of landforms. Soil classification systems; soil chemistry; soil erosion and degradation; coastal processes and management. Slope stability analysis and remediation of unstable natural and cut slopes. Seepage through landfill liners and natural aquifers.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for two semesters based on two hours per week of lectures and one hour per week of tutorial/laboratory sessions.

**Assessment** Test, assignments and laboratory reports, 30%; examination, 70% in both semesters.

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**EGC3260 GEOMECHANICS A**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite(s)** ECS 2220 Structural Analysis A.

**Content** Semester one: Origin of rocks; basic geological processes; stratigraphy; surficial geology maps; geology of Melbourne. Formation and transportation of soils; classification, description and engineering properties of soil and rock. Phase relationships. Clay behaviour. Gravitational stresses in the ground; principle of effective stress. Permeability; seepage of water through soil; flow nets. Compaction of soils and crushed rock, including methods, specification and field evaluation. Site exploration, including desk study, pit and boring methods, logging and reporting; vane shear test and Standard Penetration Test. Introduction to shear strength; drained and undrained triaxial tests; direct shear; strength parameters. Semester two: Bearing capacity of shallow and deep foundations on fine and course-grained soils, under vertical and inclined loads and moments. Group effects in piled foundations. Contact stress distribution and stress change with depth beneath foundations. Immediate settlement of foundations on fine-grained soils. Consolidation theory; amount and rate of settlement. Pure pressure changes in soil under stress changes. Settlement estimation on course-grained soils using Cone Penetration Test, SPT and pressuremeter. Total, differential and allowable settlements. In situ testing for stress-strain properties and strata location, including CPT and pressuremeter. Pumping, borehole and percolation testing for permeability. Ground stabilisation and modification.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for two semesters, based on two hours per week of lectures and one hour per week tutorial/laboratory sessions.

**Assessment** Test, assignments and laboratory reports: 30%; examination: 70%; in both semesters.

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**EGC4461 GEOENVIRONMENTAL ENGINEERING**

**Campus** Footscray Park

**Prerequisite(s)** EGC3260 Geomechanics A.

**Content** Introduction to geo-environmental engineering and waste containment systems. Waste and leachate characteristics.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester, based on two hours per week of lectures and one hour per week tutorial/design session.

Assessment Tests, assignments and design reports, 100%.

ECK2432 DOMESTIC CONSTRUCTION

Campus Footscray Park

Prerequisite(s) ECM1632 Building Engineering, EZD1310 Graphic Communication


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lectures and one hour per week tutorial session.

Assessment Assignments, projects, 50%; examination, 50%.

ECK3430 BUILDING CONSTRUCTION AND PROJECT

Campus Footscray Park

Prerequisite(s) ECK2432 Domestic Construction.

Content Semester one: Planning and development of an industrial building. Alternative structural systems. Tilt-up construction, construction of masonry, portal frame structures. Industrial floor construction techniques. Use of fabric and space structures. Builders’ plant and equipment. Use of explosives. Services requirements for industrial buildings. Damp proof courses and water proofing. Recycling, rehabilitation and renovation of buildings. Building maintenance. Concept of intelligent buildings. Materials management on building sites. Site visits to large major industrial construction sites. Semester two: An engineering problem is investigated in the form of a case study or optimisation study. The economic viability of various solutions is carefully considered, and local application of new techniques is carefully taken into account. The planned investigation must be approved and draft report submitted. The main finding is presented to the class as to a professional audience. Finally a technical report is submitted, as from a consultant to a client. Preparation of working drawings, including construction detailing, engineering services drawing. Outline specification for a single storey commercial or industrial building. Building Practice. Modelling of medium-sized building projects.

Required Reading To be advised by lecturer.


Class Contact Three hours per week in semester one based on two hours per week of lectures and one hour per week tutorial session. Four hours per week in semester two based on two hours per week of lectures and two hour per week tutorial session.

Assessment Assignments, projects, 50%; examination, 50%.

ECK4430 COMMERCIAL BUILDING CONSTRUCTION

Campus Footscray Park

Prerequisite(s) ECK3430 Building Construction and Project; ECM3531 Construction Management.


Required Reading To be advised by lecturer.


Class Contact Four hours per week in semester one based on three hours per week of lectures and one hour per week tutorial
session. Three hours per week in semester two based on two hours per week of lectures and one hour per week tutorial session.

**Assessment** Assignments, projects 50%; examination, 50%.

**ECM1534 BUILT ENVIRONMENT ENGINEERING**

**Campus** Footscray Park  
**Prerequisite(s)** Nil  

**Required Reading** To be advised by lecturer.


**Class Contact** Two hours per week for one semester based on one hour of lecture and one hour of tutorial.

**Assessment** Assignments and projects, 40%; examination, 60%.

**ECM3531 CONSTRUCTION MANAGEMENT**

**Campus** Footscray Park  
**Prerequisite(s)** Nil  

**Required Reading** To be advised by lecturer.


**Class Contact** Four hours per week for one semester based on two hours per week of lectures and two hours per week of tutorial/computer sessions.

**Assessment** Assignments and projects, 40%; examination, 60%.

**ECM4532 ENGINEERING PROJECT MANAGEMENT**

**Campus** Footscray Park  
**Prerequisite(s)** BMO3522 Engineers as Managers, ECM4532 Engineering Project Management.  

**Required Reading** To be advised by lecturer.


**Class Contact** Four hours per week for one semester based on two hours per week of lectures and two hours per week of tutorial sessions.

**Assessment** Assignments and projects, 40%; examination, 60%.

**ECM4562 BUILDING QUANTITIES AND COSTS**

**Campus** Footscray Park  
**Prerequisite(s)** ECM4531 Construction Management.  
**Content** The project development process, the parties and the trades involved in the process. Bill of quantities. Quantity surveyor’s role. Introduction to schedule of rates of the bill of quantities and components, measurement of quantities. Estimating principal trades, contractors’ cost estimates and

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on two hours per week of lectures and one hour per week tutorial session.

**Assessment** Assignments, projects, 40%; examination, 60%.

### ECN 1622 SUSTAINABLE DEVELOPMENT

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** Approaches to conservation and sustainable development. Overview of key environmental issues: human population growth, infrastructure requirements, materials, and energy usage; conservation and management of natural resources, maintenance of biodiversity, etc. Consideration of the interrelationship between engineering development and the environment, including case studies on a range of infrastructure development issues.

**Required Reading** To be advised by lecturer.


**Class Contact** Two hours per week for one semester based on one hour lecture and one hour lecture/tutorial session.

**Assessment** Assignments, 35%; end-of-semester examination, 65%.

### ECN 3350 ENGINEERING FOR SUSTAINABILITY

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite(s)** ECF3450 Hydrologic Processes.

**Content** Semester one: Desirable features for sustainable land and urban development. Various aspects of planning natural resource management and conservation. Environmental data collection, sensitivity mapping, land capability rating and sustainable use. Landscaping, green cities and vegetation management. Planning and engineering design of subdivisions, streets and water supply systems. Total water cycle management concepts, water and energy sensitive allotment and urban design. Design exercises related to topics above. Semester two: Rural land and water management, clean production and life cycle analysis.

**Introduction to environmental audits, management plans and systems, and risk assessment. More detailed consideration of the impact of engineering technologies and development on society, and the ecological, social, economic and political criteria by which they might be assessed from a sustainability viewpoint. Material will consist mainly of case studies and design exercises. An individual major investigation and/or design project and technical report on a relevant and approved topic must also be completed.**


**Class Contact** Four hours per week for two semesters based on two hours lectures and two hours tutorial, design and project sessions.

**Assessment** Assignments and design exercises, 40%; major project, 15%; end-of-semester examinations, 45%.

### ECN 4410 ENVIRONMENTAL ENGINEERING

**Campus** Footscray Park

**Prerequisite(s)** Nil


**Class Contact** Three hours per week for two semesters based on two hours of lectures and one hour of tutorial/laboratory session.

**Assessment** Assignments and tests, 25%; examination, 75%.
ECN4411 ENVIRONMENTAL PLANNING & DESIGN

Campus Footscray Park
Prerequisite(s) Nil
Co-requisite(s) Nil
Content Desirable features for sustainable land and urban development. Environmental, strategic, regional and local planning; environmental data collection and inventories, environmental sensitivity mapping, land capability rating and sustainable use. Landscaping, green cities and vegetation management. Residential subdivision and street design, including energy efficiency and water management aspects. The role of municipalities and councils. Design exercises related to topics above.
Class Contact Three hours per week for one semester based on 1.5 hours of lectures and 1.5 hours of tutorial/design sessions.
Assessment Assignments, designs 50%; end-of-semester examination, 50%.

ECS2220 STRUCTURAL ANALYSIS A

Campus Footscray Park
Prerequisite(s) EZS1210 Solid Mechanics A.
Content Semester one: Bending moment, shear force and axial force diagrams for determinate beams and frames; use of superposition. Stresses and strains in two dimensions, Mohr's circle. Shear stress distribution in beams. Torsion in solid and simple frames with bending and torsion. Semester two: Further analysis of determinate plane trusses by method of joints; obvious zero force members. Site visit to timber bridge and follow-up design check. Capacities of timber structures. Material science of timber.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for two semesters based on one hour lecture, one hour lecture/tutorial, one hour tutorial.
Assessment Assignments, tests, 25%; end-of-semester examinations, 75%.

ECS2221 MATERIALS AND STRUCTURES

Campus Footscray Park
Prerequisite(s) Nil
Content Fundamental concepts including force, moments, equilibrium, loads, reactions, tension, compression, bending moments, shear forces, stress, strain and deflections. Analysis of simple beams, frames, columns, arches and cable-supported structures. Introductory structural design computations. Overview of properties of major structural materials including steel, concrete, timber, brick, and masonry. Overview of building design including foundations, floors, walls and roofs.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester based on one hour lecture, one hour lecture/tutorial, one hour tutorial.
Assessment Stage test and laboratory report, 30%; examination, 70%.

ECS2320 STRUCTURAL DESIGN A

Campus Footscray Park
Prerequisite(s) ECS2220 Structural Analysis A.
Co-requisite(s) ECS2320 Structural Analysis A.
Content Semester one: The basis for structural design; actions and capacities. Load actions; computation of loads from materials and live load intensities; the effect of tributary area on live load; the nature of loads; load surveys; probability density plots for loads; risk concepts for determining design loads; load factors for various strengths and service limit states. The role of structural analysis in design; the determination of shear force and bending moment diagrams, deflections; some review of solid mechanics. General principles of capacities for all structural materials; steel being mainly referred to. The basic probabilistic problem of designing to ensure that capacities exceed actions; limit states. Capacity reduction factors. Capacities of beams in bending and shear as a function of section and material properties. The role of material science in structural design. Capacities determined in accordance with elastic and plastic criteria; lateral torsional buckling not in course. Resistance to deflection as a function second moment of area and elastic modulus. Choosing members by determining required section properties. Capacities of tension members; minor eccentricities. Capacities of concentrically loaded columns according to squashing limits, Euler buckling limits and AS4100 tables. Efficiencies of structural shapes for beams, tension members and columns. Capacities of bolted and welded connections; concentric and eccentric loads; loads in shear and tension; web shear plates, plate and member splices, simple endplates. Throughout the semester general principles are covered with minimal use of structural codes. The conversion of building plans with chunky members and detail to simple structural line diagrams used in analysis. Design of structural members and connections from building plans. Site visit to simple steel bridge with follow-up design check. Semester two: Capacities of timber structures. Material science of timber. Capacities of timber beams limited by bending, shear and deflection. Capacities of timber columns, simple bolted and nailed connections. Site visit to timber bridge and follow-up design check. Computation for the effects of load duration and buckling. Observations of the effects of moisture, member size and other factors affecting strength and stiffness. Capacities of reinforced concrete structures not subjected to buckling.
Capacities of cantilevers and simply supported beams limited by bending, deflection and shear. Theoretical curtailment points for reinforcement. Capacities of columns subjected to axial load and bending.

**Required Reading** Notes provided in bookshop or by lecturer. For semester two, students must purchase HB2.2-1998, *Australian Standards for Civil Engineering Students – Structural Engineering, Standards Australia.


**Class Contact** Three hours per week for two semesters based on two hours of lecture and a one hour tutorial session.

**Assessment** For each semester a 20% mid-semester test and an 80% three hour final exam. The assessment for each semester is weighted equally towards to total assessment for the subject.

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**ECS3220 STRUCTURAL ANALYSIS B**

**Campus** Footscray Park

**Prerequisite(s)** ECS2220 Structural Analysis A.

**Content** Semester one: Solution of redundant beams and frames by the stiffness method: slope deflection equations and moment distribution; general concept of structure stiffness. Further qualitative analysis of frames (prediction of deflected shape, directions of reactions and shape of bending moment diagram). Analysis of redundant beams and frames on microcomputer using a commercial analysis program such as SPACEGASS; appraisal of computer results using both qualitative and quantitative checks. Plastic analysis of beams and frames: plastic moment, shape factor, partial plasticity, plastic hinge, moment redistribution, upper and lower bound collapse load calculations, design considerations. Semester two: Flexibility/Virtual Work analysis of redundant trusses, beams and frames. Approximate analysis of structures. Matrix stiffness analysis of beams and frames including three dimensional structures. (Matrix operations performed using Spreadsheet software.) Effect of high axial forces on member bending stiffness; stability analysis and buckling of frames.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for two semesters comprising two hours of lecture and one hour of tutorial.

**Assessment** Assignments and tests, 25%; end-of-semester examinations, 75%.

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**ECS3320 STRUCTURAL DESIGN B**

**Campus** Footscray Park

**Prerequisite(s)** ECS2220 Structural Design A.

**Co-prerequisite(s)** ECS2220 Structural Analysis B.


**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for two semesters, based on two hours per week of lectures and one hour per week tutorial session.

**Assessment** Design projects, 30%; examinations, 70%.

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**ECS4221 ADVANCED STRUCTURAL ANALYSIS**

**Campus** Footscray Park

**Prerequisite(s)** ECS3220 Structural Analysis B; ECS3320 Structural Design B.

**Content** Basic concepts of finite element analysis. Element stiffness and mass matrices. Analysis of frames and plates using a commercial finite element analysis package such as STRAND. Buckling analysis of columns, frames and plates. Free and forced vibration of single degree of freedom systems. Vibration with damping. Vibration of multi degree-of-freedom systems. Natural frequencies and mode shapes. Dynamic analysis of beams, slabs and other continuum structures using finite elements.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on one hour of lecture and two hours tutorial session.

**Assessment** Tests, 45%; Assignments, projects, 55%.

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**ECS4321 STRUCTURAL ENGINEERING**

**Campus** Footscray Park

**Prerequisite(s)** ECS3220 Structural Analysis B; ECS3320 Structural Design B.

Introduction to tilt up panel design. Introduction to composite slab design. Design of indeterminate prestressed continuous beams and slabs.

**Required Reading**


**Recommended Reading**


**Class Contact**

Three hours per week for one semester based on two hours per week of lectures and one hour per week tutorial session.

**Assessment**

Design projects, 30%; examinations, 70%.

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**ECS4342 CIVIL ENGINEERING STRUCTURES**

**Campus** Foottscray Park

**Prerequisite(s)** ECS3320 Structural Analysis B; ECS3320 Structural Design B.

**Co-requisite(s)** ECS4321 Structural Engineering.

**Content** Design of ground water storage tanks of circular shape. Loadings for bridge design. Design of bridges including continuous composite prestressed concrete bridge girders. Effects of creep and temperature differentials on bridge design. Structural design of underground pipes.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on two hours of lectures and one hour tutorial session.

**Assessment** Assignments, projects, 20%; examination, 80%.

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**ECS4422 SPECIAL TOPICS IN STRUCTURES**

**Campus** Foottscray Park

**Prerequisite(s)** ECS3320 Structural Analysis B; ECS3320 Structural Design B.

**Content** Structural optimisation for minimising weight of structure for given loads and frame arrangement. Introduction to the finite element computer program, STRAND. Fire Engineering: Design of barriers and structures for Fire: application of the Building Code of Australia, engineering design in steel, timber and reinforced concrete. Site visit to laboratory where fire testing of structures is conducted.

**Required Reading** To be advised by lecturer.

**Recommended Reading** ASCE, *Structural Fire Protection*, ASCE.

**Class Contact** Three hours per week for one semester based on two hours per week of lectures and one hour per week tutorial session.

**Assessment** Assignments, projects, 30%; examination, 70%.

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**ECS4462 FOUNDATION ENGINEERING**

**Campus** Foottscray Park

**Prerequisite(s)** ECG3260 Geomechanics A.

**Content** Soil moisture suction; foundations for light structures on reactive clays. Computation of lateral active and passive stresses and thrusts. Stability of rigid and flexible retaining walls and braced cuts; ground anchors. Dewatering of excavations. Structural design of footings, rafts, piles, retaining structures and excavation support systems.

**Required Reading** To be advised by lecturer.

**Recommended Reading**


**Class Contact** Three hours per week for one semester, based on two hours per week of lectures and one hour per week tutorial session.

**Assessment** Assignments, projects, 30%; examination, 70%.

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**ECT2420 ENGINEERING SURVEYING**

**Campus** Foottscray Park

**Prerequisite(s)** Nil.

**Content**


**Required Reading** Class Notes: James, G., *Survey Notes*.


**Class Contact** Three hours per week for two semesters based on 1 hour of lecture and 2 hours field/laboratory tutorial sessions.

**Assessment** Class assignments, 10%; field tutorial assignments, 20%; end-of-semester examinations, 70%.

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**ECT2421 SURVEYING**

**Campus** Foottscray Park

**Prerequisite(s)** Nil.


**Required Reading** Class Notes: James G., *Survey Notes*.


**Class Contact** Three hours per week for one semester based on one hour of lecture and two hours of field/laboratory tutorials.
ECT3440 TRANSPORTATION ENGINEERING

Campus Footscray Park

Prerequisite(s) Nil.

Content Semester one: Road construction procedures and equipment; calculation of earthwork volumes; plans and drawings used in roadworks construction; road location; geometric design including horizontal and vertical alignment and development of superelevation; road materials; introduction to pavement design methods for flexible and rigid pavements; road drainage. Semester two: Historical development of transport modes; trip characteristics; land use planning and the transport planning process including trip generation and trip distribution models; mode choice factors and trip assignment procedures. Traffic engineering: capacity, volume, headway and speed analyses; traffic survey techniques; travel demand management and local area traffic management; signalised intersection analysis including use of SIDRA computer program.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for two semesters, based on two hours of lectures and one hour of tutorial session.

Assessment Assignments, 20%; end-of-semester examinations, 80%.

ECZ2290 ENERGY STUDIES A

Campus Footscray Park

Prerequisite(s) SPH1601 Physics 1SA and SPH1602 Physics 1SB


Class Contact Three hours per week for two semesters based on two hour lectures and one hour tutorial/laboratory work.

Assessment Assignments, tests, laboratory work, 50%; end-of-semester examinations, 50%.

ECZ2510 PROJECT MANAGEMENT

Campus Footscray Park

Prerequisite(s) Nil.

Content Semester one: Introduction to engineering project management including planning, feasibility and economic studies, environmental impact assessment and construction management. Principles of estimating and economic evaluation of projects. Current trends in computer applications in project management. Selection strategies for plant and equipment. Overview of a range of methods used in community consultation programs on engineering projects including identification of stakeholders, public meetings, displays, information days, focus group discussions, mail outs and use of the media. Semester two: Tendering processes, strategies and practices. Forms of construction contracts. Contract administration and management including variations, delay claims, liquidated damages, time extension, finalisation. Maintenance contracts. Cost management systems for project control. Site administration for medium sized projects. Impact of political power processes on project approval and operation. Community influences on decision making and project management. Critical role and interaction with new media including case studies.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for two semesters based on 1.5 hours lecture and 1.5 hours tutorials session.

Assessment Assignments and projects, 50%; end-of-semester examinations, 50%.

ECZ3490 ENERGY STUDIES B

Campus Footscray Park

Prerequisite(s) ECZ2290 Energy Studies A.


Class Contact Three hours per week for two semesters based on two hour lectures and one hour tutorial/laboratory work.

Assessment Assignments, tests, laboratory work, 50%; end-of-semester examinations, 50%.
Required Reading  To be advised by lecturer.


Class Contact  Three hours per week for two semesters based on two hour lectures and one hour tutorial/laboratory session.

Assessment  Assignments, laboratory work, projects, 50%; examination, 50%.

EEA1002 ELECTRICAL ENGINEERING 1.2

Campus  Footscray Park

Prerequisite(s)  EEA1001 Electrical Engineering 1.1, SMA1201 Mathematics IAP


Required Reading  Notes on each topic are provided. The lecture material should be supplemented by using text mentioned in the recommended reading.


Class Contact  Four hours per week for one semester based on two hours per week of lecture, one hour per week of tutorial and one hour per week of laboratory exercises.

Assessment  Test 20%; laboratory 10%; examination 70%. A pass in each component of assessment is required for a subject pass.

EEA2001 LINEAR SYSTEMS 2.1

Campus  Footscray Park

Prerequisite(s)  EEA1002 Electrical Engineering 1.2


Class Contact  Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment  Laboratory work/tests/assignment, 30%; examination 70%. Satisfactory result in each component of assessment is necessary for a subject pass.

EEA2002 LINEAR SYSTEMS 2.2

Campus  Footscray Park

Prerequisite(s)  EEA2001 Linear Systems 2.1


Class Contact  Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment  Laboratory work/tests/assignment, 30%; examination 70%. Satisfactory result in each component of assessment is necessary for a subject pass.

EEA2010 ELECTRICAL ENGINEERING 2.1

Campus  Footscray Park, Werribee

Prerequisite(s)  SMA1201 Mathematics IAP

Content  Fundamentals of Electrical Circuit Theory: Circuit theorems, Ohms Law, Kirchhoff’s Laws, nodal voltage method, simple DC circuit analysis and reduction, power in DC circuits, maximum power transfer, introduction to AC circuits, sources, circuit components, reactance, impedance, power in AC circuits, power factor, power factor correction and its importance. Operational Amplifier Application: integration, differentiation, summing, differential input amplifier.


Class Contact Three hours per week for one semester based on two hours per week of lecture and one hour per week of tutorial/laboratory exercises.

Assessment Tests and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEA2002 ELECTRICAL ENGINEERING 2.2
Campus Footscray Park
Prerequisite(s) EEA1001 Electrical Engineering 2.1

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester. Comprising two hours per week of lecture and two hours tutorial/laboratory exercises per fortnight.

Assessment Tests and assignments or laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEA2001 CONTROL PRINCIPLES 2.2
Campus Footscray Park.
Prerequisite(s) EEA1002 Electrical Engineering 1.2; SMA1202 Mathematics I A Q.


Class Contact Three hours per week for one semester based on two hours of lectures and tutorials and one hour of laboratory.

Assessment Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEA3001 CONTROL SYSTEMS 3.1
Campus Footscray Park.
Prerequisite(s) EEA2001 Circuits and Control 2.1.


Class Contact Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment Test and laboratory exercises, 30%; examination, 70%. A pass in each component of assessment is required for a subject pass.

EEA3002 CONTROL SYSTEMS 3.2
Campus Footscray Park
Prerequisite(s) EEA3001 Control Systems 3.1
Content Introduction to the design and compensation of control systems. Simple cascade compensators. Compensation using root-locus techniques and using frequency domain methods, PID controllers. Compensator realisation. Introduction to state space analysis of systems.


Class Contact Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment Laboratory based project, 30%; examination, 70%. A pass in each component of assessment is required for a subject pass.

EEA3501 DIGITAL CONTROL PRINCIPLES 3.1
Campus Footscray Park
Prerequisite(s) EEA2502 Control Principles 2.2


Class Contact Three hours per week for one semester based on two hours of lecture and tutorial one hour of laboratory.

Assessment Tests, assignments and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEA3502 DIGITAL CONTROL PRINCIPLES 3.2
Campus Footscray Park
Prerequisite(s) EEA3501 Control Principles 3.1
Content The subject comprises one control system project that is to design, develop and implement a digital controller applied to real-time digital control of an item of electrical equipment. The project is allocated on an individual basis. Students are to start with no prior knowledge of the plant and its transfer function, characteristics, which are to be determined experimentally. Any necessary filtering, transducer equipment, etc. is to be designed and manufactured, before coupling the computer to the actual plant. Measurements of transfer functions should be taken using IEEE-48 bus. One of the controllers is a dead beat controller and the other can be selected from given specifications. It is expected that some of the results for the project will be taken and presented using computer data acquisition techniques.


Class Contact Three hours per week for one semester based on two hours of lecture and tutorial and one hour of laboratory.

Assessment Project 30%, report 30%, oral presentation 40%. A pass in each component of assessment is required for a subject pass.

EEA400 CONTROL SYSTEMS 4.1

Campus Footscray Park

Prerequisite(s) EEA3002 Control Systems 3.2


Class Contact Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment Test, 10%; laboratory exercises, 50%; examination, 40%. A pass in each component of assessment is required for a subject pass.

EEA402 CONTROL SYSTEMS 4.2

Campus Footscray Park

Prerequisite(s) EEA4001 Control Systems 4.1

Content This subject comprises one control system project, that is to design, develop and implement a digital controller applied to real-time control of an item of equipment. Students are to start by determining a model of the plant. Any necessary filtering, transducer equipment, etc. is to be designed and manufactured before coupling the computer to the plant. It is required that some of the results for the project will be taken and presented using computer data acquisition techniques.


Class Contact Three hours per week for one semester predominantly of laboratory work.

Assessment Project 40%, report 30%, oral presentation 30%. A pass in each component of assessment is required for a subject pass.

EAA404 ROBOTICS AND AUTOMATION 4.1

Campus Footscray Park

Prerequisite(s) EEW2002 Computer Systems 2.2; SMA2201 Mathematics B; EEC2602 Data Structures and Algorithm Analysis 2.2 or equivalent subjects.

Content Programmable Logic Controllers: Introduction to PLCs, programming and application. Overview of Robotics, classification, control methods, drive mechanisms. Programming and applications of specific robots. Homogenous transforms, configurations. Euler angles. Introduction to KAREL. Robotic Vision: vision systems, introduction to image processing, edge detection algorithms, hough transform methods, stereo vision.

Required Reading Notes on each topic are provided. These notes should be supplemented by using the texts mentioned in Recommended Reading.


Class Contact Three hours per week for one semester based on one hour per week of lecture and two hours per week of laboratory exercises.

Assessment Tests, assignments and laboratory exercises, 50%; examination, 50%. A pass in each component of assessment is required for a subject pass.

EAA404 FUZZY CONTROL AND APPLICATIONS 4.2

Campus Footscray Park

Prerequisite(s) EEA3002 Control Systems 3.2.

Content Introduction to fuzzy sets theory: vagueness and uncertainty formalisation problem, fuzzy sets theory and probability theory comparison and discussion, fuzzy set definitions, properties of fuzzy sets, operations on fuzzy sets. Fuzzy relations: classical relations, fuzzy relations, operation on fuzzy relations, the extension principal. Natural language formalisation and approximate reasoning: linguistic variables, fuzzy propositions, fuzzy if – then statements, inference rules. Theoretical fundamentals of fuzzy control: the structure of a fuzzy controller, the rule base, the data base, the inference engine, choice of fuzzification and defuzzification procedures. Software and hardware tools for fuzzy control. Fuzzy controller design using software packages. Applications of fuzzy control. Neural-fuzzy control.


Class Contact Three hours per week or one semester based on one and a half hours per week of lecture/tutorial and one and a half hours per week of laboratory exercises and project work.

Assessment To be advised by lecturer.
EEC1001 PROGRAMMING STRUCTURES 1.1
Campus Footscray Park
Prerequisite(s) Nil.
Content A brief introduction to computer components, organisation and programming. Basic elements of a program, names and keywords, statement execution, input/output operations, simple data types, arithmetic, expressions, predefined functions, errors. Control structures, logical operators, selection and repetition. Algorithm design and documentation. A high level language such as C/C++ is used to enhance student's understanding through practical application.
Class Contact Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory.
Assessment Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEC1002 PROGRAMMING STRUCTURES 1.2
Campus Footscray Park
Prerequisite(s) EEC1001 Programming Structures 1.1
Content Introduction to the stages involved in developing software. Discussion of the software practices that lead to a quality product. Basic elements of problem analysis and program design. Continuation of problem solving using a high level language such as C/C++. Implementation of top-down designs by developing user defined functions, with single results and with output parameters. Introduction to pointers and memory management. Data structure design and implementation using arrays and structures. Character arrays and strings, multidimensional arrays. File operations.
Class Contact Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory.
Assessment Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEC2501 SOFTWARE ENGINEERING 2.1
Campus Footscray Park
Prerequisite(s) EEC1002 Programming Structures 1.2 or SCM1312 Programming 2 or equivalent
Content Introduction to the engineering of quality software. Waterfall and spiral lifecycle models. System analysis and the production of a software requirements definition and specification. Use of levelled flow diagrams to model the processing in the system. Process specifications and data dictionary production. Software design process, principles and production. User interface design, information presentation and evaluation. The testing process, planning and strategies. A team project is undertaken to reinforce the principles taught in lectures. The use of a simple CASE tool is included.
Class Contact Three hours per week for one semester based on one hour of lectures, two hours of tutorial/laboratory.
Assessment Test, assignment and laboratory exercises: 35%, examination 65%. A satisfactory level of assessment for both components is required for a subject pass.

EEC2511 OPERATING SYSTEMS 2.1
Campus Footscray Park
Prerequisite(s) EEC1002 Programming Structures 1.2.
Content Functions and characteristics of an operating system. Introduction to the UNIX operating system, commands and utilities. Memory management, objectives, virtual memory, allocation policies. Input and output procedures, device handlers, buffering, file devices and spooling. Filing system objectives, sharing, security and integrity. Resource allocation and scheduling, algorithms, control and accounting. Protection and reliability.
Class Contact Three hours per week for one semester based on one hour of lectures and two hours of tutorial/practical work.
Assessment Test, assignments and laboratory exercises 35%, examination 65%. A pass in each component of assessment is required for a subject pass.

EEC2602 DATA STRUCTURES AND ALGORITHM ANALYSIS 2.2
Campus Footscray Park
Prerequisite(s) SCM2311 Object Oriented Programming 1; EEC2501 Software Engineering 2.1
Content Data Abstraction; Storage Structures; Collection Classes; Arrays; Linked lists; Iterators; Stacks, Queues, Recursion; Priority Queues; Trees; Heaps; Sorting algorithms; Searching algorithms; Tables; Hashing; File processing; Indexing; Graphs.
Class Contact Three hours per week for two semesters based on two hours of lecture and one hour of laboratory.
Assessment Examination, 65%; Test, assignment, laboratories, 35%. A satisfactory level of assessment in each component of the subject is required for a subject pass.
EEC3001 SOFTWARE SYSTEMS 3.1

Campus Footscray Park

Prerequisite(s) EEC2001 Computer Systems 2.2.


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week of tutorial and one hour per week of laboratory exercises.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEC3504 COMPUTERS AND SOCIETY 3.2

Campus Footscray Park

Prerequisite(s) Nil.


Required Reading To be advised by the lecturer.


Class Contact Three hours per week for one semester based on three hours per week of lecture/seminar.

Assessment Assessment will be based on written assignments, participation and seminar presentation.

EEC311 SOFTWARE ENGINEERING 3.1

Campus Footscray Park

Prerequisite(s) EEC2501 Software Engineering 2.1;

Content Introduction to requirements elicitation, analysis and modelling. Development of a software system design from the requirements model. Comparison of analysis and design techniques. Software reliability and reuse. Verification and validation. CASE tools and software engineering environments. Software project planning and estimating.


Class Contact Three hours per week for one semester comprising one hour per week of lecture, and two hours per week of tutorial/laboratory class.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for subject pass.

EEC3601 WINDOWS PROGRAMMING 3.1

Campus Footscray Park

Prerequisite(s) EEC2602 Data Structures and Algorithm Analysis 2.2 or EEE2001 Computer Systems 2.1

Content Introduction to graphical user interfaces (GUI). Application of object oriented techniques to the production of windows-based programs. Program design, placement and sizing. Menus and implementation. Development of class libraries for windows applications. Platform independent window toolkit case study.

Required Reading To be advised.

Recommended Reading To be advised by lecturer.

Class Contact Three hours per week for one semester based on one hour of lecture and two hours of tutorial/laboratory.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component is required for a subject pass.

EEC3604 PROGRAMMING TOOLS AND COMPILERS 3.2

Campus Footscray Park

Prerequisite(s) EEC2602 Data Structures and Algorithm Analysis 2.2.


Class Contact Three hours per week for one semester based on two hours of lecture, and one hour of tutorial/practical work.

Assessment Tests, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEC3704 NETWORK SOFTWARE AND MANAGEMENT 3.2

Campus Footscray Park

Prerequisite(s) EEC2602 Data Structures and Algorithm Analysis 2.2, or SCM3311 Object Oriented Programming 2. EET2502 Computer Communications 2.2.


Required Reading To be advised by lecturer.

Class Contact: Four hours per week for one semester based on two hours of lecture and one hour of tutorial and one hour of laboratory.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of the subject is required for a subject pass.

EEC3801 DATABASE SYSTEMS 3.1

Campus: Footscray Park

Prerequisite(s): EEC2602 Data Structures and Algorithm Analysis 2.2 or SCM2311 Object Oriented Programming 1, or EYE2001 Computer Systems 2.1


Class Contact: Three hours per week for one semester based on two hours of lecture and one hour of tutorial/laboratory.

Assessment: Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component is required for a subject pass.

EEC3802 INTRODUCTION TO ARTIFICIAL INTELLIGENCE 3.2

Campus: Footscray Park

Prerequisite(s): EEC2602 Data Structures and Algorithm Analysis 2.2 or SCM2311 Object Oriented Programming 1, or EYE2001 Computer Systems 2.1

Content: Representing knowledge using various techniques such as predicate calculus, semantic networks and frames. Demonstrating the need for heuristics to search amongst alternatives to find a solution. Production systems and the development of expert systems and expert system shells. Organisation of knowledge and the management of uncertainty. Natural language processing, analysis and parsing. Introduction to neural networks. Practical application of real-world problems suitable for an expert system solution, using a suitable AI language.


Class Contact: Three hours per week for one semester based on one hour of lecture and two hours of tutorial/laboratory.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of the subject is required for a subject pass.

EEC3803 ADMINISTERING MICROSOFT® WINDOWS 3.1

Campus: Footscray Park

Prerequisite(s): Completed 2nd year of Computer Technology Course or equivalent.


Required Reading: Subject materials will be provided by Microsoft®.


Class Contact: Three hours per week for one semester based on one hour of lecture and two hours of tutorial/practical work. The tutorial/practical will be taken in block mode, and will constitute the equivalent of 26 hours of class contact for the semester.

Assessment: Assignments, practical exercises, tests, 35%; examination, 65%. Satisfactory results must be obtained in each component of the subject to obtain a subject pass.

EEC3804 COMPUTER GRAPHICS 3.2

Campus: Footscray Park

Prerequisite(s): EEC2602 Data Structures and Algorithm Analysis 2.2 or EYE2001 Computer Systems 2.1


Class Contact: Three hours per week for one semester based on one hour lecture and two hours of laboratory class.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEC4001 SOFTWARE PROJECT MANAGEMENT 4.1

Campus: Footscray Park

Prerequisite(s): Completed Year 3.

Content: The subject identifies the role of practical management in the acquisition and control of software based projects. It develops project management strategies suitable for software based systems, and demonstrates the efficiency of suitable management in a project environment. Students are introduced to the appropriate industry standards and their work will be expected to comply with these.


Class Contact: Three hours per week for one semester comprising one one-hour lecture, one one-hour laboratory and one one-hour tutorial.

Assessment: Examination, 50%; practical work, assignment/tutorial, 50%. A satisfactory level of assessment in each component of the subject is required for a subject pass.
EEC433I COMPUTER IMAGE PROCESSING 4.1

Campus Footscray Park
Prerequisite(s) Completed Year 3.
Co-requisite(s) EEL4401 Neural Networks and Fuzzy Logic 4.1.
Content This subject introduces the students to computer imaging and image processing. It provides a thorough grounding in the topic areas to prepare students for research and applications. Subject material includes image acquisition and representation, image transforms, image coding, image enhancement, segmentation, object identification and representation. Also included are architectures for image processing systems including neural networks and their application on pattern recognition.
Required Reading Prescribed notes.
Class Contact Three hours per week for one semester comprising two hours per week of lectures and one one-hour laboratory.
Assessment Semester examination, 50%; tests, assignments and laboratory work, 50%. A satisfactory level of assessment in all major areas of the subject is required for a subject pass.

EEC4700 RESEARCH PROJECT 4.0

Campus Footscray Park
Prerequisite(s) Nil.
Co-requisite(s) Need to be enrolled in (or have completed) three elective subjects.
Content This subject provides students with experience of in-depth research concepts by means of a substantial software oriented project. Students are expected to apply the principles of software engineering to ensure the successful completion of their project.
Required Reading Nil.
Class Contact Thirteen hours per week for two semesters. This includes time for the presentation of formal progress reports but is mainly to be used by the student for research work using facilities on Campus.
Assessment The emphasis is in the research technique, and disciplines utilised (20%), as the project may be open-ended or one of a number in an overall design. Assessment also includes a formal written thesis (65%) and an oral presentation at a formal seminar (5%). These are supplemented by several progress reports presented both on a written and oral basis (10%). A typical design project requires the student to spend a significant number of ‘out of class’ hours on the project work in the final year.

EEC102 DESIGN PRACTICES 1.2

Campus Footscray Park
Prerequisite(s) Nil.
Class Contact Two hours per week for one semester based on one hour per week practical and one hour per week theory.
Assessment Test, assignment, 40%; practical work, 60%. A pass in each component of assessment is required for a subject pass.

EED2502 DESIGN PROJECT 2.2

Campus Footscray Park
Prerequisite(s) EED1012, EEE2001, EEH2001
Co-requisite(s) Nil.
Content This subject gives the student a grounding in the planning, design, construction, and evaluation of electronics hardware, and leads on to more advanced project work in later years of the course. Two design and construction projects will be undertaken. The first a minor project, will be carried out on an individual basis and involve a PCB fabrication. The second a major project, will be a group project to specifications given. Design and construction of the major project is shared by the group, and a group report is prepared. Each student presents a seminar with emphasis on the student’s contribution to the project.
Required Reading To be advised by the lecturer.
Class Contact Three hours per week for one semester consisting of one hour per week of lecture and two hours per week of laboratory work.
Assessment Minor project, 30%; Major project, 40%; Individual seminar, 10%; Group project report, 20%.

EED3000 DESIGN 3.0

Campus Footscray Park
Prerequisite(s) All second year subjects except EMW2001, SMA2201, SMA2212, SMA2242
Content The concepts developed in previous years are consolidated by project work of a more specialised nature allocated on an individual basis. The theory is more applications orientated, and covers the concepts of reliability, heat transfer, illumination design, and acoustic noise control and equipment and system reliability. Modelling and computer techniques are emphasised as a path to a working prototype which bypasses the cut and try breadboard stage.


Class Contact Four hours per week based on one hour per week of lecture, and three hours per week of tutorial/project work.
Assessment Theory Assessment: Assignments, examination, 34%. Project work consists of two individual projects. Each project 33%.

EED3510 DESIGN PROJECT
Campus Footscray Park
Prerequisite(s) Completed 2nd year
Co-requisite(s) ACE3143 and ACE3144 English Language and Communications 3 and 4. EEC3511 Software Engineering 3.1
Content Application of systems analysis and design principles to develop an individual project with a substantial software and/or hardware component. Development of a system and the associated documentation is undertaken as a staged process, with deliverables and presentation at the end of each stage. The stages are: system requirements elicitation and analysis, including validation activities, system design, implementation, verification and testing. Computer aided design tools are used as appropriate.


Class Contact Three hours per week for two semesters comprising one hour per week tutorial and two hours per week of project work.
Assessment Project, 100%.

EED4000 DESIGN AND PROJECT MANAGEMENT 4.0
Campus Footscray Park
Prerequisite(s) Completed third year.
Content The concepts developed in previous years are consolidated by an advanced project of specialised nature allocated on an individual basis. The theory covers system design, mass production design, and studies relating to grounding, shielding and electromagnetic compatibility. A humanities communication component of the subject is designed to improve written and oral communication skills, to assist in the planning and preparation of engineering reports, and in competing for contracts and employment.


Class Contact Semester one: Seven hours per week based on three hours per week of lecture and four hours per week of project work. Semester two: Seven hours per week based on three hours per week of lecture and four hours per week of project work.
Assessment Engineering theory and project 70%, of this the project is 70% and the examination is 30%; Humanities communication skills 30%.

EDE 1001 ELECTRONICS 1.1
Campus Footscray Park
Prerequisite(s) Nil
Corequisite(s) EEA1001 Electrical Engineering 1.1


Class Contact Four hours per week for one semester based on two hours per week of lecture and one hour per week tutorial and one hour per week of laboratory.
Assessment Test, assignment and laboratory, 25% examination, 75%. Satisfactory performance in each component of assessment is required for a subject pass.

EDE 1002 ELECTRONICS 1.2
Campus Footscray Park
Prerequisite(s) Nil
Corequisite(s) Nil
Content Number systems and codes, radix conversions, binary arithmetic. Ideal logic gates. Boolean Algebra and equation reduction. Combinational logic circuit design. Latches and flip-flops, ripple counters, simple synchronous counters and state machines. TTL device characteristics, fanout and loading.


Class Contact Four hours per week for one semester based on two hours per week of lecture and one hour per week tutorial and one hour of laboratory.
Assessment Test, assignment and laboratory, 35% examination, 65%. A pass in each component of assessment is required for a subject pass. Supplementary assessment is not available.
EEE1611 ENGINEERING IN SOCIETY

Campus Footscray Park

Prerequisite(s) Nil

Content The changing role of science and engineering including the history of engineering and contributions of scientists and engineers to society. The need for creativity, leadership and consideration of aesthetics. Education of scientists and engineers including study skills and learning theories. Role of professional societies and ethics. Influence of scientists and engineers on environmental issues, politics, power and decision making. Introduction to the role of industry and business.

Required Reading To be advised.


Class Contact Two hours per week for one semester, based on an integrated approach comprising, one hour of lecture and one hour of tutorial.

Assessment Assignments 35%, seminars 15% and examination 50%. A pass in each component of assessment is required for a subject pass.

EEE2001 ELECTRONICS 2.1

Campus Footscray Park

Prerequisite(s) EEE1001 Electronics 1.1

Content PSPICE; operational amplifier, non linear characteristics, switching applications of op. amps. BJT small signal models, BJT amplifiers. MOSFET and JFET amplifiers and their SPICE parameters. GaAs Devices, MESFET.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour of tutorial and one hour of laboratory exercises.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEE2002 ELECTRONICS 2.2

Campus Footscray Park

Prerequisite(s) EEE2001 Electronics 2.2


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour of tutorial and one hour of laboratory exercises.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEE2501 ELECTRONICS 2.5

Campus Footscray Park

Prerequisite(s) EEE1002 Electronics 1.2


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour of tutorial and one hour of laboratory.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEE2503 ELECTRONICS 2.6

Campus Footscray Park

Prerequisite(s) EEE2501 Electronics 2.5


Recommended Reading Bogart, T.F. 1993, Electronic Devices and Circuit, 3rd edn, Merrill.

Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour of tutorial and one hour of laboratory.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEE3001 ELECTRONIC CIRCUITS 3.1

Campus Footscray Park

Prerequisite(s) EEE2002 Electronics 2.2.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week of tutorial and one hour of laboratory exercises.
EE3002 ELECTRONIC CIRCUITS 3.2

Prerequisite(s) EE3001 Electronic Circuits 3.1


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week of tutorial and one hour per week of laboratory/practical work.

Assessment Practical work, 50%; examination, 50%. A pass in each component of assessment is required for a subject pass.

EE4004 MICROWAVE ELECTRONICS 4.2

Prerequisite(s) EE3002 Electronic Circuits 3.2; EET3101 Communication Engineering 3.1.

Content Review of binary arithmetic and shift registers. An introduction to 8 bit microprocessors – using the Motorola 68HC11 as the example. The 68HC11 architecture, assembly language instruction set, addressing modes etc. Microcomputer system devices (e.g. RAM, ROM and Input/Output) and the Memory Map. An introduction to assembly language programming and programs with loops. The use of index registers and microprocessor stacks. Simple subroutines and an introduction to interrupts.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week of tutorial and one hour per week of laboratory exercises.

Assessment Tests, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEH2001 DIGITAL ELECTRONICS 2.1

Prerequisite(s) EEE1002 Electronics 1.2.

Content MSI devices: decoders, multiplexes, encoders and demultiplexers. Circuit design using these MSI devices. Arithmetic devices and ALUs. Error detection and correction. MSI sequential circuits. CMOS, BiCMOS, BiMOS devices, characteristics, interfacing between logic families. Clock circuits. ROM Realisation of circuits.

EEH2002 DIGITAL ELECTRONICS 2.2

Prerequisite(s) EEE2001 Digital Electronics 2.1.

Content Programmable logic devices, Classification and structure of PLA, PAL, PLE, and special PLD features. Logic design using PLD’s. Analysis of clocked sequential circuits. Synthesis of clocked sequential circuits. State table reduction and state assignment. Sequential circuit design using MSI/LSI devices.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week of tutorial and one hour per week of laboratory exercises.

Assessment Tests, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EE2601 MICROPROCESSOR SYSTEMS 2.1

Prerequisite(s) EEE1002 Electronics 1.2.

Content An introduction to the 8086 microprocessor architecture. Assembly language programming and programs with loops. The use of index registers and microprocessor stacks. Simple subroutines and an introduction to interrupts.


Class Contact Three hours per week for one semester based on one hour each of lecture, tutorial and laboratory.

Assessment Tests, assignments, tutorials, laboratories, etc., 35%; examination, 65%. Students must achieve satisfactory performance in each component of the assessment and attend a minimum of 80% of all labs and tutorials to obtain a pass in the subject.
EEH2602 MICROPROCESSOR SYSTEMS 2.2

Campus Footscray Park

Prerequisite(s) EEH2601 Microprocessor Systems 2.1, EEH2701 Digital Systems 2.1, EEC2501 Software Engineering 2.1, SCM2311 Oriented Programming 1

Content Revision of assembly language programming using advanced addressing modes. Object codes and post bytes. Stack and stack instructions. Subroutines. Assembly language programming extended to cover engineering applications involving serial and parallel data input and output handling, interrupts, event counting, timing and analog to digital conversion. Microprocessor hardware design principles covering bus architectures, address decoding, digital to analog conversion and input/output techniques. Students will also construct and test their own 68HC11 microcomputer board.

Required Reading Students may select one of the following as an appropriate text book for this subject. The others may then be considered as appropriate Recommended Reading. Miller, G.H., Microcomputer Engineering, Prentice Hall

Tocci, R.J., et.al., Microprocessors and Microcomputers, Prentice Hall


Class Contact Three hours per week for one semester based on one hour of lecture and two hours of laboratory/tutorial work.

Assessment Test, assignment and laboratory exercises, 35%; examination, 65%. Satisfactory performance in each component of assessment is required for a subject pass. Students must also attend a minimum of 80% of all lab and tutorial classes.

EEH2701 DIGITAL SYSTEMS 2.1

Campus Footscray Park

Prerequisite(s) EEE1002 Electronics 1.2

Content MSI devices including decoders, muxs, demuxs, comparators, counters, registers, ALUs, etc. Device function, cascading principles and data path applications. An introduction to the Algorithmic State machine design method. ASM charts, controller design and implementation.


Class Contact Three hours per week for one semester based on one hour of lecture and one hour of tutorial and one hour of laboratory exercises.

Assessment Laboratory, 10%; final examination, 90%. A pass in each component of assessment is required for a subject pass. Supplementary assessment is not available.

EEH2702 DIGITAL SYSTEMS 2.2

Campus Footscray Park

Prerequisite(s) EEE2701 Digital Systems 2.1, EEE1001 Electronics 1.1

Content PLD types and architectures. Fusesmap interpretation. Implementation of data path elements and sequential controllers on PLDs using a programmable logic compiler (CUPL). The ASM technique implemented on PLDs. Digital to analog and analog to digital conversion. Device interfacing between logic families and to external sensors/actuators.


Class Contact Three hours per week for one semester based on one hour of lecture and one hour of tutorial and one hour of laboratory exercises.

Assessment Laboratory, 10%; final examination, 90%. A pass in each component of assessment is required for a subject pass. Supplementary assessment is not available.

EEH3002 MULTIMEDIA CIRCUITS AND SYSTEMS 3.2

Campus Footscray Park

Prerequisite(s) EEE2002 Digital Electronics 2.2 or equivalent subjects.

Content Analysis of multimedia functions and systems. Introduction to silicon fabrication process. Digital and analogue circuit design, static and dynamic design techniques. Circuit protection and scaling. CMOS latch up. CAD Tools. VLSI circuit simulation and testing. GaAs VLSI circuits for multimedia applications. Introduction to VHDL.


Class Contact Three hours per week for one semester based on one hour per week of lecture and two hours per week of laboratory exercises.

Assessment Laboratory exercises 20%, project 50%, examination 30%. A pass in each component of assessment is required for a subject pass.

EEH3101 DIGITAL CIRCUITS 3.1

Campus Footscray Park, Werribee.

Prerequisite(s) EEA2102 Electrical Engineering 2.2.


Class Contact Based on one hour per week lecture, one hour per week tutorial and one hour per week laboratory exercises.

Assessment Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEH3201 COMPUTER AND DIGITAL DESIGN 3.1

Campus Footscray Park
Prerequisite(s) EEY2002 Computer Systems 2.2, EEH2002 Digital Systems 2.2

Content 1/O interface programming techniques using both assembler level and C programming techniques. 1/O driver programming using BIOS and register level methods. Introduction to interrupts, interrupt vectors and programmable interrupt controllers. Timing facilities including programmable timers and real time clocks. Programming asynchronous serial 1/O operations using a UART. Programming parallel 1/O operations and DMA. Managing large programs using macros and libraries. Industrial applications of microprocessors.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week tutorial and one hour per week of laboratory exercises.

Assessment Tests, assignments and laboratory exercises, 35%; examination, 65%. A pass in each assessment component of the work is required for a subject pass.

EEH3202 COMPUTER AND DIGITAL DESIGN 3.2

Campus Footscray Park

Prerequisite(s) EEY2002 Computer Systems 2.2

Content Iterative circuits: cell models, design techniques using state machine techniques. Asynchronous circuits: analysis and synthesis techniques, realisation. Algorithmic State Machine design approach: controller/architecture model, top-down design approach, ASM charts, realisation, design pitfalls. Register Transfer Language (RTL) design techniques, RTL language, notation and constructs, data path and data units, bus transfers.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week tutorial and one hour per week of laboratory exercises.

Assessment Tests, assignments and laboratory exercises, 35%; examination, 65%. A pass in each assessment component of the work is required for a subject pass.

EEH3204 INTEGRATED CIRCUIT DESIGN 3.2

Campus Footscray Park

Prerequisite(s) EEH2002 Digital Electronics 2.2 or equivalent

Content Introduction to silicon fabrication process. Digital and analogue circuit design, static and dynamic design techniques, random logic, PLA, domino, NORA, multi-clock phase circuits. Circuit protection and scaling. CMOS latch up. CAD Tools, Summit, Mentor, HSPICE, VLSI circuit simulation and testing. Future fast VLSI circuits. (GaAs).


Class Contact Three hours per week for one semester based on one hour per week of lecture and two hours per week of tutorial/laboratory exercises.

Assessment Laboratory exercises 20%; project 50%; examination, 30%. A pass in each component of assessment is required for a subject pass.

EEH3504 EMBEDDED SYSTEMS 3.1

Campus Footscray Park

Prerequisite(s) EEH2002 Digital Electronics 2.2 or EEH2602 Microprocessor Systems 2.2

Content Advanced microprocessor concepts using the Motorola 68XXX family of 32 bit microprocessors. The programming model, instruction set and addressing modes, exception processing, bus behaviour and interfacing to external devices. Embedded microcontrollers using the 68XXX core. Integration of high level language modules. Efficiency in assembly language programming techniques.

Recommended Reading Antonakios, J.L., The 68000 Microprocessor, Prentice Hall.


Class Contact Three hours per week for one semester based on one hour per week of lecture and two hours per week for tutorial/laboratory.

Assessment Examination 100%.

EEH3604 DIGITAL SYSTEMS 3.1

Campus Footscray Park

Prerequisite(s) EEH2701 Digital Systems 2.1, EEH2702 Digital Systems 2.2.

Content Description of data path elements in VHDL. Use of concurrent signal assignment statements and process statements to describe- decoders, encoders, counters, registers, comparators, ALUs, etc. Port mapping entities to form hierarchical design structures. Review of the ASM design method and controller description in VHDL. An introduction to linked and partitioned controller design. The impact of VHDL programming style on the synthesized circuit structure. VHDL constraints for CPLD and FPGA mapping. Asynchronous circuit design: analysis, flow and transition tables, race conditions. State assignment and reduction techniques. Iterative circuits.

Required Reading Skahill, K., 1996, VHDL for Programmable Logic, Addison Wesley.


Class Contact Three hours per week for one semester based on one hour per week of lecture, tutorial and laboratory.

Assessment Test, assignment and laboratory exercises, 20%; examination, 80%. A pass in each component of assessment is required for a subject pass. Supplementary assessment is not available.

EEH3704 MULTIPROCESSOR SYSTEMS 3.2

Campus Footscray Park

Prerequisite(s) EEC2501 Software Engineering 2.1; EEC2511 Operating Systems 2.1.
Content: Introduction to multiprocessing and concurrent programming. Classification of computer architectures – Von Neumann, SIMD, MIMD, array, and data flow computers; shared memory and distributed memory interconnection network; performance measurement; parallel algorithms; Occam programming: communication channel operation; concepts of mutual exclusion; semaphore; monitor; typical concurrent programming problems.

Recommended Reading: Notes on each topic are provided. These notes should be supplemented by using the texts mentioned in the recommended reading.


Class Contact: Three hours per week for one semester based on one hour per week of lecture two hours per week of tutorial/laboratory.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEH4101 COMPUTER AND DIGITAL DESIGN 4.1

Campus: Footscray Park

Prerequisite(s): EEE3202 Computer and Digital Design 3.2, EEC3001 Software Systems 3.1


Class Contact: Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEH4102 COMPUTER AND DIGITAL DESIGN 4.2

Campus: Footscray Park

Prerequisite(s): EEE3204 Integrated Circuit Design 3.2.


Required Reading: Gopalan, K., 1996, Introduction to Digital Microelectronic Circuits, IRWIN
connections. DC machines, circuit models, characteristics and speed control.


**Class Contact** Three hours per week for one semester based on two hours per week of lecture, and one hour per week of tutorial/laboratory exercises.

**Assessment** Tests, 10%; laboratory exercises, 10%; examination, 80%. A pass in each component of assessment is required for a subject pass.

**EEP2241 POWER SYSTEM FUNDAMENTALS 2.1**

Campus Footscray Park

**Prerequisite(s)** SMA1201 Mathematics 1AP, SPH1602 Physics 1SB or equivalent subjects.

**Content** Fundamentals of electromagnetism. Electricity in terms of resistance, inductance and capacitance as elements in electrical circuits. Series and parallel circuits. Alternating and direct current and voltage and their roles in electrical systems. Circuit analysis methods. Fundamentals of single phase and multi phase circuits. Concept of power and energy measurement and testing. Instrumentation of measurement of current, voltage, capacitance, inductance, power and energy.

**Required Reading** To be advised by lecturer.


**Class Contact** Two hours per week for one semester, based on one hour per week of lectures and one hour tutorial/laboratory session.

**Assessment** Assignments, laboratory work, 35%; examination, 65%.

**EEP2242 POWER SYSTEM FUNDAMENTALS 2.2**

Campus Footscray Park

**Prerequisite(s)** EEP2241 Power System Fundamentals 2.1, SPH1602 Physics 1SB.

**Content** Power sources and their performance. Harmonics in power supplies and waveform analysis. Voltage and current transformers and their properties. Fundamental performance characteristics of generators and alternators. Types and basic performance characteristics of electric motors. Performance and selection criteria appropriate for electric pumps.

**Required Reading** To be advised by lecturer.


**Class Contact** Two hours per week for one semester, based on one hour per week of lectures and one hour tutorial/laboratory session.

**Assessment** Assignments, laboratory work, 35%; examination, 65%.

**EEP3001 POWER SYSTEMS 3.1**

Campus Footscray Park

**Prerequisite(s)** EEP2001 Power Systems 2.1


**Class Contact** Three hours per week for one semester based on two hours per week of lecture, and one hour per week of tutorial/laboratory exercises.

**Assessment** Test, 10%; laboratory exercises, 10%; examination, 80%. A pass in each component of assessment is required for a subject pass.

**EEP3002 POWER SYSTEMS 3.2**

Campus Footscray Park

**Prerequisite(s)** EEP2001 Power Systems 2.1

**Content** Basic concepts in power systems, energy transmission distribution and conversion, per unit and quantities. Current and voltage relations for short, medium and long transmission lines. Network calculations. Power converters.


**Class Contact** Three hours per week for one semester based on two hours per week of lecture, and one hour per week of tutorial/laboratory exercises.

**Assessment** Test, 10%; laboratory exercises, 20%; examination, 70%. A pass in each component of assessment is required for a subject pass.

**EEP4001 POWER SYSTEMS 4.1**

Campus Footscray Park

**Prerequisite(s)** EEP3002 Power Systems 3.2


**Class Contact** Three hours per week based on two hours per week of lecture and tutorial and one hour per week of laboratory exercises.

**Assessment** Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.
EEP4002 POWER SYSTEMS 4.2

Campus Footscray Park

Prerequisite(s) EEP3002 Power Systems 3.2

Content Load flow analysis: techniques, interactive methods, Guas Siedel and Newton Raphson approach. System frequency dynamics and control: load characteristics and yearly variation, maintenance, planning and generation. Power frequency dynamics: automatic generation, interconnection. Economics of power supply: Kelvins law, p.f. correction, tariffs. Insulators: testing, voltage distribution, pollution flashover, HVDC systems: inverter and converter operation and analysis, equivalent circuits, interaction and control, comparison with AC transmission, HVDC, links.


Class Contact Three hours per week based on two hours per week of lecture and tutorial and one hour per week of laboratory exercises.

Assessment Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEP4004 DISTRIBUTION SYSTEMS 4.2

Campus Footscray Park

Prerequisite(s) EEP3002 Power Systems 3.2.


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on one hour per week of lecture, one hour per week of tutorial and one hour per week of laboratory exercises.

Assessment Test, assignments and project, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

EEP2001 MULTIMEDIA PROGRAM PRODUCTION 2.1

Campus Footscray Park/ St Albans

Prerequisite(s) Nil


Required Reading Notes on each topic are provided. These notes should be supplemented by using the texts mentioned in the recommended reading.


Class Contact Three hours per week for one semester based on one hour per week of lecture and two hours per week of workshop and laboratory exercises.

Assessment Assignments and tests 50%, project 50%. A pass in each component is required for a subject pass.

EEP2002 COMMUNICATION SYSTEM 2.2

Campus Footscray Park

Prerequisite(s) SMA1202 Mathematics 1AQ


Class Contact Three hours per week for one semester based on two hours per week of lecture, one hour per week of tutorial/laboratory exercises.

Assessment Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EEP2101 MULTIMEDIA TECHNIQUES 2.1

Campus Footscray Park

Prerequisite(s) EEC1002 Programming Structures

Content Introduction to the methods processing and transmission of image and video data. The architecture of Digital Video Broadcasting (DVB) systems including terrestrial, cable and satellite methods. Digital image and video camera technology and standard data file formats. Basic steps in image and video compression as employed in the JPEG and MPEG standards including motion estimation and motion compensation in video compression. Techniques for internet and wireless transmission of images and video and problems of congestion and packet loss.

Required Reading Notes on each topic are provided.


Class Contact Three hours per week for one semester based on one hour per week of lecture and one hour per week of laboratory.

Assessment Examination, 50%; test, assignment and laboratory exercises 50%.
EET2602 COMPUTER COMMUNICATIONS D

Campus Footscray Park
Prerequisite(s) Nil.

Content Overview of computer communication systems. Electrical signals and signal analysis. Transmission media. Transmission line theory, wave equation, VSWR, Smith chart, characteristic impedance, coaxial cable, waveguide, microstrip line, stub matching techniques, Maxwell equations, TE, TM and TEM modes, antenna and free space propagations, microwave devices.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour laboratory exercises.

Assessment Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component is required for a subject pass.

EET2603 MULTIMEDIA COMMUNICATION NETWORKS 3.2

Campus Footscray Park
Prerequisite(s) EET2002 Communication Systems A.


Required Reading To be advised.

Recommended Reading Stallings, W., 1992, ISDN and Broadband ISDN, 2nd edn, MacMillan.

Class Contact Three hours per week for one semester based on two hours per week of lecture and one hour per week of laboratory exercises.

Assessment Test, assignment and laboratory exercises 30%, examination 70%. A pass in each component of assessment is required for a subject pass.

EET3001 COMMUNICATION ENGINEERING 3.1

Campus Footscray Park
Prerequisite(s) EET2002 Communication Systems 2.2.

Content Transmission line theory, wave equation, VSWR, Smith chart, characteristic impedance, coaxial cable, waveguide, microstrip line, stub matching techniques, Maxwell equations, TE, TM and TEM modes, antenna and free space propagations, microwave devices.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EET3102 COMMUNICATION ENGINEERING 3.2

Campus Footscray Park
Prerequisite(s) EET3101 Communication Engineering 3.1

Content Spectral analysis of random signals, auto-correlation and cross-correlation functions of non-deterministic communication signals, line coding techniques, pseudo-random sequences and their application, gaussian noise, noise temperature, performance of baseband data communication systems in noise, bit-error rate (BER) calculation, signal to noise analysis of DSB, SSB and FM modulations.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EET3501 COMPUTER COMMUNICATIONS 3.1

Campus Footscray Park
Prerequisite(s) EET2502 Computer Communications 2.2 or EET2002 Communication Systems 2.2


Class Contact: Three hours per week for one semester, based on two hours of lecture and tutorial, and one hour of laboratory.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

**EET4001 SIGNAL PROCESSING 4.1**

Content: Application of DFT, discrete convolution, spectrum estimation, windows; DSP building blocks, matched filters, multirate systems; adaptive systems, LMS algorithm; examples. Low sensitivity filter structures.


Class Contact: Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment: Project, laboratory exercises and assignment, 50%; examination, 50%. A pass in each component of assessment is required for a subject pass.

**EET4002 SIGNAL PROCESSING 4.2**

Prerequisite(s): EET4001 Signal Processing 4.1

Content: Introduction to Digital Filters


Class Contact: Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

Assessment: Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

**EET5002 COMPUTER COMMUNICATIONS 3.2**

Campus: Footscray Park

Prerequisite(s): EET3501 Computer Communications 3.1.


Class Contact: Three hours per week for one semester, based on two hours of lecture and tutorial, and one hour of laboratory.

Assessment: Test, assignment and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

**EET4104 SATELLITE COMMUNICATION 4.1**

Campus: Footscray Park

Prerequisite(s): EET3102 Communication Engineering 3.2


Required Reading: Nil


Class Contact: Three hours per week for one semester based on two hours per week of lecture and one hour per week of tutorial and design practice.

Assessment: Practical work and assignments, 50%; examination, 50%. A pass in each component of assessment is required for a subject pass.

**EET4204 COMMUNICATION SYSTEMS DESIGN 4.2**

Campus: Footscray Park

Prerequisite(s): EET3102 Communication Engineering 3.2

Content: In this unit students are guided in the design of actual communication systems and management of telecommunications networks. The principles of communication systems design are introduced through a series of design assignments using modern communications systems and networks, including: optical fibre, ATM and broadband networks, mobile radio and data communications. The emphasis is placed on technical performance as well as economics and human engineering considerations. Students are also introduced to OSI network management and telecommunications management network standards.

EET4302 MULTIMEDIA SYSTEMS DESIGN 4.2

Campus Footscray Park
Prerequisite(s) EET3102 Communication Engineering 3.2

Content In this subject students are guided in the design of communication systems. The principles of communications systems design are introduced through a series of designs in key areas, such as multimedia user interface systems and fibre optic networks. Emphasis is placed on the technical performance as well as economic and human engineering considerations of the overall systems. International standards are introduced wherever applicable.

Required Reading To be advised.


Class Contact Three hours per week for one semester based on two hours per week of lecture and one hour per week of laboratory exercises.

Assessment Exercises and design assignments 70%, test 30%. A pass in each component of assessment is required for a subject pass.

EET4401 MOBILE COMMUNICATION SYSTEMS 4.1

Campus Footscray Park
Prerequisite(s) EET3102 Communication Engineering 3.2


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lecture and one hour per week of tutorial/seminar.

Assessment Examination 70%, assignments 30%.

EET4402 TELETRAFFIC ENGINEERING 4.2

Campus Footscray Park
Prerequisite(s) EET3102 Communication Engineering 3.2


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours lecture and one hour of laboratory.

Assessment Examination 70%, laboratory/assignments 30%. A satisfactory level of assessment for each component is required for a subject pass.

EET4501 BROAD BAND ISDN 4.1

Campus Footscray Park
Prerequisite(s) EET3102 Communication Engineering 3.2


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours per week of lecture and one hour per week of laboratory exercises.

Assessment Test, assignment and laboratory exercises 30%; examination 70%. A pass in each component of assessment is required for a subject pass.

EET4701 COMMUNICATION SYSTEMS 4.1

Campus Footscray Park
Prerequisite(s) EET3102 Communication Engineering 3.2


**Required Reading** To be advised by the lecturer.


**Class Contact** Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

**Assessment** Assignments, project and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

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**EET4702 COMMUNICATION SYSTEMS 4.2**

**Campus** Footscray Park

**Prerequisite(s)** EET4701 Communication Systems 4.1


**Required Reading** To be advised by the lecturer.


**Class Contact** Three hours per week for one semester based on two hours per week of lecture/tutorial and one hour per week of laboratory exercises.

**Assessment** Assignments, project and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

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**EEY1002 COMPUTER TECHNOLOGY**

**Campus** Footscray Park

**Prerequisite(s)** SCM1111 Introduction to Computer Systems 1, SCM1311 Programming 1, SPH1100 Electronics 1.

**Content** Introduction to MC68HC11 microcomputer architecture. Memory devices and map. Assembler and simulator. Instruction set and addressing modes. Data transfer, arithmetic and logical instructions. Object codes and post bytes. Stack and jump instructions. Simple subroutines.

**Required Reading** Students may select one of the following as an appropriate textbook for this subject. The others may then be considered as appropriate Recommended Reading.


Tocci, R.J., et al., *Microprocessors and Microcomputers*, Prentice Hall

Greenfield, J.D., *The 68HC11 Microcontroller*,

**Class Contact** Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory.

**Assessment** Test, assignment, tutorials and laboratory, 35%; examination, 65%. Satisfactory performance in each component of assessment is required for a subject pass. Students must also attend a minimum of 80% of all laboratories and tutorials.

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**EEY2001 COMPUTER SYSTEMS 2.1**

**Campus** Footscray Park

**Prerequisite(s)** EEC1002 Programming Structures or ETC1112 Introduction to Computing 1.2

**Content** Problem solving and programming. Analysis, design and implementation of abstract data types and classes. Input and output streams. Introduction to numerical methods.


**Recommended Reading** Dietel, H.M. and Dietel, P.J., 1998, *C++ How to Program.*

**Class Contact** Three hours per week for one semester based on two hours per week of lecture, and one hour per week of tutorial/laboratory exercises.

**Assessment** Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

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**EEY2002 COMPUTER SYSTEMS 2.2**

**Campus** Footscray Park

**Prerequisite(s)** EEE2001 Computer Systems 2.1

**Content** Introduction to 80x86 architectures and CPU register operations. Computer instruction types including arithmetic, logical, stack and jump instructions. Memory addressing modes including indirect addressing. Assembly-level and mixed language programming techniques. Use of the stack for passing parameters between assembly and C-language procedures. Source code and machine level debugging techniques. Use of software interrupts to access ROMBIOS functions.


**Class Contact** Three hours per week for one semester based on two hours per week of lecture, and one hour per week of tutorial/laboratory exercises.

**Assessment** Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

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**EEY4002 MULTIMEDIA NETWORK MANAGEMENT 4.2**

**Campus** Footscray Park

**Prerequisite(s)** EET3102 Communication Engineering 3.2 and EEE3202 Computer and Digital Design 3.2


**Required Reading** To be advised.

EEY401 COMPUTER SYSTEMS 4.1

Campus Footscray Park

Prerequisite(s) EEC3001 Software Systems 3.1, EEH3201 Computer and Digital Systems 3.1

Content Human machine interface: Design principles. Development of an engineering computer system by integration of operating systems, application software and I/O driver design. Database: Introduction to concept of databases and to a commercial database package. Real time software design: Requirements and functionality of real time software and real time operating systems.

Required Reading To be advised.


Class Contact Three hours per week for one semester based on two hours per week of lecture/seminar and one hour per week of laboratory exercises.

Assessment Tests, assignments and laboratory exercises, 50%; examination, 50%. A pass in each component of assessment is required for a subject pass.

EEY402 COMPUTER SYSTEMS 4.2

Campus Footscray Park

Prerequisite(s) EEY4101 Computer Systems 4.1


Required Reading To be advised.


Class Contact Three hours per week for one semester based on two hours per week of lecture/seminar and one hour per week of laboratory exercises.

Assessment Tests, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

EMC2112 ENGINEERING COMPUTATIONS A

Campus Footscray Park

Prerequisite(s) BCO1101 Computer Applications

Corequisite(s) Nil

Content Use of programmable software package and/or programming language to solve scientific and engineering problems. Visual programming environment using Visual Basic.


Class Contact Three hours per week for two semesters based on one hour lecture, two hours tutorial/laboratory session.

Assessment Assignments, tests, and laboratory exercises: 40%, laboratory examination: 60% for both semesters.

EMC2112 ENGINEERING COMPUTATIONS B

Campus Footscray Park

Prerequisite(s) EMC2112 Engineering Computations A; SMA1201 Mathematics IAP, SMA1202 Mathematics I AQ.


Required Reading Lecture notes and class notes.


Class Contact Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory sessions.

Assessment Laboratory examination, 50%; practical computing assignments, 50%.

EMC3111 ENGINEERING COMPUTATIONS C

Campus Footscray Park

Prerequisite(s) EMC2122 Engineering Computations B; SMA 2201 Mathematics B.


Required Reading Lecture notes and class notes. Online Help.


Class Contact Four hours per week for one semester based on two one hour lectures and one two hour tutorial/laboratory session.

Assessment Assignments, tests, 50%; Examination, 50%.

EMD2302 COMPUTER AIDED DRAFTING

Campus Footscray Park
Prerequisite(s) Nil.

Content The aim of this subject is to introduce the student to the discipline of Engineering Drawing. Although the subject is conducted on Autocad Computer Aided Facilities, the student will gain thorough knowledge of the fundamentals of drawing to Australian Standard. On completion, the student will be able to produce and understand what is required of Engineering Drawings in industry. The subject is based on the following topics: drawing of standard entities, lines, circles etc; use of layers and colour; use of editing facilities for fast production of drawings; dimensioning routines; use of blocks and multiple entry of entities; isometric drawing; three dimensional representation; solids modelling; demonstration of internal and external programming facilities; use of DXF and database files. Students will use a 'hands on' approach to carry out exercises in software familiarisation; producing assembly and detail drawings of optical instruments and associated equipment; flowcharting; three dimensional modelling.


Class Contact Two hours per week for two semesters. Attendance is compulsory.

Assessment Assessment is based on the overall performance on assignments, periodic progress checks and attendance. Final mark is based on 80% for assignments and 20% for attendance. Supplementary assessment will not normally be available.

EMD2310 MECHANICAL DESIGN A

Campus Footscray Park

Prerequisite(s) EZS1210 Solid Mechanics A; EZD1310 Graphic Communication.


Class Contact Three hours per week for two semesters based on one hour lecture and two hour tutorial/laboratory sessions.

Assessment Tests, assignments and laboratory exercises, 60%; examination at the end of semester two, 40%.

EMD2401 INTRODUCTION TO ENGINEERING DESIGN

Campus Footscray Park

Prerequisite(s) Nil.

Content The aim of this subject is to introduce students to design methods. The subject includes: introduction to designing; the role of the designer and the design cycle; case studies of product development; modelling and ergonomics; introduction to standards and codes of practice; decision making and morphological analysis techniques; human factors in design; properties of materials and statistical nature of factor of safety; reliability.


Class Contact Four hours per week for two semesters, comprising one two-hour lecture and one one-hour tutorial.

Assessment Assignments and/or project work, 50%. Supplementary examination will not normally be available.

EMD3310 MECHANICAL DESIGN B

Campus Footscray Park

Prerequisite(s) EMD2211 Solid Mechanics B; EMD2310 Mechanical Design A.


Class Contact Three hours per week for two semesters based on one hour lecture and two hour tutorial/laboratory sessions.

Assessment Tests, assignments and laboratory exercises, 50%; examination at the end of semester two, 50%.

EMD4320 MECHANICAL DESIGN C

Campus Footscray Park

Prerequisite(s) EMD3310 Mechanical Design B.


Recommended Reading Australian Standards where required.

Class Contact Four hours per week for two semesters based on two hour lectures and two hour tutorial/laboratory sessions.

Assessment Assignments, tests and project work, 50%; examination at the end of semester two, 50%.
EMF3212 FLUID MECHANICS B

Campus Footscray Park

Prerequisite(s) EZS1210 Fluid Mechanics A.


Required Reading To be advised by lecturer.

Recommended Reading Shapiro, A.H. 1953, The Dynamics and Thermodynamics of Compressible Fluid Flow vol 1, Wiley.

Class Contact Three hours per week for one semester based on two hours of lectures and one hour tutorial/laboratory session.

Assessment Assignments 5%; tests 35%; laboratory reports 10%; examination, 50%.

EMF4411 FLUID MECHANICS C

Campus Footscray Park

Prerequisite(s) EMF3212 Fluid Mechanics B.


Required Reading To be advised by lecturer.

Recommended Reading Shapiro, A.H. 1953, The Dynamics and Thermodynamics of Compressible Fluid Flow vol 1, Wiley.

Class Contact Three hours per week for one semester based on two hours of lectures and one hour tutorial/laboratory session.

Assessment Assignments, tests and laboratory work, 30%; examination, 70%.

EMS2211 SOLID MECHANICS B

Campus Footscray Park

Prerequisite(s) EZS 1210 Solid Mechanics A.

Content Thin cylinders and shells. Bending stresses in beams, composite beams, reinforced concrete beams. Torsion, uniform circular shafts, springs, non-uniform circular shafts. Stress/strain transformation, equations, Mohr's circle. Three-dimensional force systems.

Required Reading Lecture notes and handouts.


Class Contact Three hours per week for one semester based on one hour of lecture and two hours tutorial/laboratory sessions.

Assessment Test, assignment and laboratory exercises, 30%; examination, 70%.

EMF3230 STRESS ANALYSIS

Campus Footscray Park

Prerequisite(s) EMS2211 Solid Mechanics B.


Required Reading Danh Tran, Stress Analysis A and Stress Analysis B, Lecture Notes.


Class Contact Three hours per week for two semesters based on two hours of lectures and one hour tutorial/laboratory session.

Assessment Assignments, 30%; examinations, 70%.

EMS4402 FRACTURE MECHANICS

Campus Footscray Park

Prerequisite(s) EMF3210 Stress Analysis; EMY4411 Computational Mechanics.


Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester based on two hours of lectures and one hour tutorial/laboratory session.

Assessment Assignments, tests and laboratory work, 40%; examination, 60%.

EMT2211 THERMODYNAMICS A

Campus Footscray Park

Prerequisite(s) SPH1601 Physics 1SA and SPH1602 Physics 1SB.

Content Extensive and intensive thermodynamics properties. Properties of a pure, simple compressible substance; the state principle, the p-v-T relation, thermodynamic property data, the p-v-T relation for gases, ideal gas model. Thermodynamics systems, state, process and equilibrium. First law of thermodynamics: mechanical concepts of energy, energy transfer by work, energy of system, energy transfer by heat. Control volume energy analysis; conservation of mass for a control volume, conservation of energy for a control volume, analysis of control volumes at steady state, transient analysis. First law analysis of open and closed systems, cycles. The second law and reversibility, corollaries of the second law, temperature-entropy diagram. Gas mixtures, partial pressure, Dalton's law and the Gibbs-Dalton law. Volumetric and gravimetric analysis of a gas mixture, properties of a gas mixture, mixtures of gas and vapour. Steam condensers.


Class Contact Three hours per week for one semester based on two hour lectures and one hour tutorial/laboratory session.

Assessment Assignments, tests and laboratory reports, 30%; examination, 70%.

**EMT230 BUILDING THERMODYNAMICS**

Campus Footscray Park

Prerequisite(s) SPH1601 Physics 1SA and SPH1602 Physics 1SB


Class Contact Two hours per week for two semesters based on one hour per week of lecture and one hour per week tutorial/laboratory session.

Assessment Assignments, tests, laboratory work, 35%; examinations, 65%.

**EMT321 THERMODYNAMICS B**

Campus Footscray Park

Prerequisite(s) EMT2211 Thermodynamics A.

Content Heat engine, expanders and positive displacement compressors, heat engine cycles, Carnot air standard cycles, internal combustion engines, vapour power cycles, Rankine cycle and its modifications, modern boiler plant, steam turbines, characteristics of performance of engine, compressors and turbine, gas turbine cycles, isentropic efficiency, modification to the basic cycle, combustion, basic chemistry, fuels, combustion equations, stoichiometric air/fuel ratio, exhaust and flue gas analysis. Heat pump and refrigeration cycles, psychrometry and thermodynamic properties of moist air, specific and relative humidity, percentage saturation, measurement of relative humidity, psychometric chart – A.I.R.A.H. chart, processes on psychrometric chart, air-conditioning systems, summer and winter air-conditioning, cooling towers.


Class Contact Three hours per week for one semester based on two hour lectures and one hour tutorial/laboratory session.

Assessment Assignment, test, laboratory report, 30%; examination, 70%.

**EMT4212 HEAT TRANSFER**

Campus Footscray Park

Prerequisite(s) EMT3211 Thermodynamics B.


Class Contact Three hours per week for one semester based on two hours of lecture and one hour tutorial/laboratory session.

Assessment Assignments, tests, project work, 30%; examination, 70%.

**EMT4412 HEATING AND AIR-CONDITIONING**

Campus Footscray Park

Prerequisite(s) EMT3211 Thermodynamics B.


Class Contact Three hours per week for one semester based on two hours of lecture and one hour tutorial.

Assessment Assignments, 65%; examination, 35%.

**EMT4421 AUTOMOTIVE ENGINEERING**

Campus Footscray Park

Prerequisite(s) EMT3211 Thermodynamics B.

Content Design and analysis of piston-type internal combustion engines: thermodynamic analysis of fuel-air cycle, piston engine mechanics, design and stress analysis of piston, connecting rod
and crankshaft, piston engine balance and flywheel, flow loss in manifolds and valve openings, heat energy distribution and dissipation, mechanics of combustion, diesel injection and combustion chambers. Design and analysis of automotive chassis components: movement of momentum analysis through torque converter elements, ratio changing, torque reaction and transmission for gearing, clutching, banding of planetary transmissions, hydraulic control of ratio changing, mechanics of braking systems, suspension and steering, mechanics of understeer for handling by computer analysis.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on one hour of lecture and two hour tutorial/laboratory sessions.

**Assessment** Assignments, laboratory reports, 70%; examination, 30%.

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**EMU4401 TRANSPORTATION DYNAMICS**

**Campus** Footscray Park

**Prerequisite(s)** Nil


**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on one hour of lecture and two hours tutorial/laboratory sessions.

**Assessment** Assignments, 30%; examination, 70%.

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**EMU4402 DESIGN AND TESTING OF CONTAINERS**

**Campus** Footscray Park

**Prerequisite(s)** EMU4401 Transportation Dynamics.

**Content** Cushioning and transmissibility curves. Design of packages based on materials properties. Environmental hazards data and product damage fragility. Compressive strength of boxes. Performance testing of shipping containers and systems using ASTM D4160 standard.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on one hour of lecture and two hours tutorial/laboratory sessions.

**Assessment** Assignments, 30%; examination, 70%.

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**EMV2212 DYNAMICS A**

**Campus** Footscray Park

**Prerequisite(s)** SPH1601 Physics 1SA, SPH1602 Physics 1SB; SMA1201 Mathematics 1AP, SMA1202 Mathematics 1AQ.

**Content** Kinematics of a particle: rectilinear motion, curvilinear motion (rectangular co-ordinates), motion of a projectile, constrained motion of connected particles, graphical solutions. Kinetics of a particle: Newton’s laws of motion, the equation of motion, rectilinear motion, curvilinear motion, system of particles, gravitational force, work, work of a force, work of a spring force, potential and kinetic energy, principle of work and energy, system of particles, conservation of energy, linear impulse and linear momentum, principle of impulse and momentum, impact.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on two hour lectures and one hour tutorial/laboratory session.

**Assessment** Tests, assignments, laboratory sessions 30%; examination, 70%.

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**EMV3210 DYNAMICS B**

**Campus** Footscray Park

**Prerequisite(s)** EMV2212 Dynamics A.


**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for two semesters based on two hours lecture and one hour laboratory/tutorial session.

**Assessment** Tests, assignments and laboratory exercises, 40%; examination at the end of each semester, 60%.

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**EMV4410 DYNAMICS OF SYSTEMS**

**Campus** Footscray Park

**Prerequisite(s)** EMV3210 Dynamics B. EMC3111, Engineering Computation.

**Content** *Semester one*: System equations and terminology; transfer functions; block diagrams and their applications to systems; time and frequency response of first and second order systems; Bode plots; root locus construction; Stability. *Semester two*: Open loop feedback and feedforward control; on-off control; closed loop feedback and feedforward control; dynamic response.
compensation; PID control; Frequency compensation design; pole placement design.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for two semesters based on two hour lectures and one hour tutorial/laboratory session.

**Assessment** Tests, assignments and laboratory exercises, 40%; examination at the end of semester, 60%.

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**EMV4411 VIBRATION AND MODAL ANALYSIS**

**Campus** Footscray Park

**Prerequisite(s)** EMV3210 Dynamics B; EMY3412 Measurement and Signal Analysis.

**Content** Philosophy of modal analysis; fundamentals of modal analysis; modal analysis in modern industries; theoretical basis of modal analysis; frequency response function measurement; modal analysis identification methods; applications of modal analysis; use of modal analysis software packages.


**Class Contact** Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory sessions.

**Assessment** Assignments, tests and laboratory work, 40%; examination at the end of semester, 60%.

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**EMW2001 MATERIALS**

**Campus** Footscray Park

**Prerequisite(s)** SPH1601 Physics 1A, SPH1602 Physics 1B.


**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on two hours per week of lecture and one hour per week of tutorial/laboratory exercises.

**Assessment** Test, assignments and laboratory exercises, 35%; examination, 65%. A pass in each component of assessment is required for a subject pass.

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**EMW3110 ENGINEERING MATERIALS**

**Campus** Footscray Park

**Prerequisite(s)** EZW2210 Principles of Material Science.


**Required Reading** Lecture notes and published papers.


**Class Contact** Three hours per week for two semesters based on two hours of lectures and one hour tutorial/laboratory session.

**Assessment** Assignments, tests and laboratory work, 35%; examination, 65%.

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**EMW4401 POLYMER PROCESSES**

**Campus** Footscray Park

**Prerequisite(s)** EMW3110 Engineering Materials.


**Class Contact** Three hours per week for one semester based on two hours of lectures and one hour tutorial/laboratory session.

**Assessment** Assignments, tests, 40%; examination, 60%.

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**EMW4402 COMPOSITE MATERIALS**

**Campus** Footscray Park

**Prerequisite(s)** EMW3110 Engineering Materials; EMS3210 Stress Analysis.


**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on two hours of lecture and one hour tutorial/laboratory session.

**Assessment** Assignments, tests, project, 30%; examination, 70%.
EMY1612 MECHANICAL ENGINEERING PRACTICE

Campus Footscray Park

Prerequisite(s) Nil

Corequisite(s) Nil

Content Introduction to Mechanical Engineering, the role of the profession in contemporary Australian Society, brief history of Mechanical Engineering. The responsibilities of Mechanical Engineers, ethics, occupational health and safety, handling of dangerous goods and noise. The education and training of Mechanical Engineers, and the role of I.E. Aust. Familiarisation with common Mechanical Engineering tools such as energy conversion devices and manufacturing processes.

Required Reading To be advised by lecturer.

Recommended Reading Carroll, B., 1988, The Engineers: 200 Years at Work for Australia, LE, Aust.


Class Contact Two hours per week for one semester, on the average, one hour lecture and one hour tutorial.

Assessment Term work (including assignments, progress reports, mid-semester and final reports and presentations on the project, mid-term examination), 75%; final examination, 25%.

EMY3100 COST ENGINEERING

Campus Footscray Park

Prerequisite(s) EMD2310 Mechanical Design A.

Content Semester one: Project engineering: plant layout, project planning, economic viability, cost evaluation, specification writing and tendering, estimating. Semester two: Time value of money and interest relationships. Methods of making economic studies; use of internal rate of return and present value concepts in making selection. Impact of inflation, taxation and depreciation on rate of return. The influence of the following factors on cost: purchasing, production, distribution, research and development, maintenance, control of personnel.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for two semesters based on one hour lecture and two hours tutorial/laboratory session.

Assessment Tests, assignments and laboratory exercises, 50%; examination at end of second semester, 50%.

EMY3412 MEASUREMENT AND SIGNAL ANALYSIS

Campus Footscray Park

Prerequisite(s) EMC2122 Engineering Computations 2.


Required Reading Printed course materials and class handouts.


Class Contact Four hours per week for one semester based on two hour lectures and two hour laboratory/tutorial sessions.

Assessment Assignments, tests and laboratory work, 40%; examination, 60%.

EMY4410 PROJECT

Campus Footscray Park

Prerequisite(s) Completion of Year 3.

Content The subject content requires each student to carry out and report on a preliminary investigation of an engineering related problem incorporating a literature review, a critical analysis of the problem, and a proposed solution. The student is expected to work in collaboration with technical support staff and fellow students and may be required to work, construct and test prototypes of the proposed solution, and report and appraisal of the entire project.

Required Reading To be advised by supervisor.


Class Contact Three hours per week for two semesters.

Assessment Major report, 80%; Progress report, 10%; Oral presentation, 10%.

EMY4411 COMPUTATIONAL MECHANICS

Campus Footscray Park

Prerequisite(s) ESM3210 Stress Analysis.


Required Reading Danh Tran, Finite Element Analysis, lecture notes.


Class Contact Three hours per week for one semester based on two hours of lecture and one hour tutorial/laboratory session.

Assessment Assignments, 30%; three hour open book examination, solving engineering problem by Finite Element Software, 70%.

EMY4412 ENERGY AND ENVIRONMENT

Campus Footscray Park

Prerequisite(s) EM3211 Thermodynamics B; EMF3212 Fluid Mechanics B; EMV3210 Dynamics B; EMY3412 Measurement and Signal Analysis.


**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester based on two hours of lecture and one hour tutorial/laboratory session.

**Assessment** Assignments, tests, and laboratory work, 40%; examination, 60%.

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**ETC1111 INTRODUCTION TO COMPUTING 1.1**

**Campus** Footscray Park

**Prerequisite(s)** Nil


**Required Reading** Lewis, J. and Loftus, W., 1999, Java Software Solutions, Addison Wesley.

**Class Contact** Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory.

**Assessment** Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

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**ETC1112 INTRODUCTION TO COMPUTING 1.2**

**Campus** Footscray Park

**Prerequisite(s)** ETC1111 Introduction to Computing 1.1


**Required Reading** Lewis, J. and Loftus, W., 1999, Java Software Solutions, Addison Wesley.

**Class Contact** Three hours per week for one semester based on one hour lecture and two hours tutorial/laboratory.

**Assessment** Test, assignment and laboratory exercises, 40%; examination, 60%. A pass in each component of assessment is required for a subject pass.

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**EZD1310 GRAPHIC COMMUNICATION**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** Drawing Practice: Linework, lettering, symbols, projections and views, dimensioning, conventional representation, preparation of layout, assembly and detail drawings, sketching – orthographic, isometric. Structural, architectural and survey design drawings. Computer Aided Drawing: Introduction to CAD software, methods of drawing entities (lines, circles, etc.), drawing aids, editing capabilities, creating and using layers, colours and line types, cross hatching, dimensioning, speed drawing. Emphasis will be placed on the preparation and use of drawings as a means of communicating design and production information. Students will be required to use a hands-on approach to create a portfolio of engineering drawings covering the range of engineering disciplines.

**Required Reading** Class notes. Horasan, M.B.N. 1998, Introduction to Autocad.


**Class Contact** Three hours per week for two semesters based on lecture, tutorial and seminar format.

**Assessment** Written tests, 10%; CAD tests, 20%; assignments, 70%. A minimum of 80% attendance at all classes is required.

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**EZF2210 BUILDING FLUID MECHANICS**

**Campus** Footscray Park

**Prerequisite(s)** SPH1601 Physics 1SA and SPH1602 Physics 1SB.

**Content** Fluid properties, pressure & its measurement. Fluid statics – forces on submerged plane and curved surfaces. Buoyancy. Fluid dynamics – fluid flow, integral equations of continuity and conservation of linear momentary applications to flow measurement and basic thermodynamic concepts – work, heat, losses, general energy equation and applications. Dimensional analysis – Buckingham PI theory, dimensionless numbers, introduction to basic principles of modelling Bernoulli equation, pipe flow-pipe friction, velocity distributions, Moody diagram, energy/hydraulic grade lines, local losses. Conservation of angular momentum and turbo machinery, pumps, turbines, affinity laws and/or open channel flow – pressure/velocity distribution, energy and momentum considerations, rapidly varied flow, control and transitions, flow measurement – weirs, flumes.


**Class Contact** Three hours per week for two semesters based on two hour lectures and one hour tutorial/laboratory session.

**Assessment** Assignments 5%, tests 35%, laboratory reports 10%; examination 50%.

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**EZF2210 BUILDING FLUID MECHANICS**

**Campus** Footscray Park

**Prerequisite(s)** SPH1601 Physics 1SA and SPH1602 Physics 1SB.


Class Contact Two hours per week for two semesters based on one hour of lecture and one hour of laboratory/tutorial session.

Assessment Assignments, tests and laboratory work, 40%; examinations, 60%.

EZW2110 PRINCIPLES OF MATERIAL SCIENCE

Campus Footscray Park

Prerequisite(s) Nil

Corequisite(s) Nil


Class Contact Two hours per week for one semester based on one hour of lecture and one hour of tutorial.

Assessment Assignments, 45% seminars, 15% examination, 40%.

EZX1410 EXPERIMENTAL STUDIES

Campus Footscray Park

Prerequisite(s) Nil

Content Students are introduced to the practice of engineering by means of a series of diverse and stimulating experimental and practical studies drawn from the major engineering discipline areas. In addition to introducing some basic engineering principles and design considerations, the experimental studies are structured to promote the acquisition of skills and knowledge related to the following: small and large scale measurement, use of instrumentation, processing and presentation of results, engineering calculations, preparing and following instructions, laboratory and work-place safety, and general experimental techniques. There is an important link between this subject and the subject Engineering Communication, in that the experimental and practical studies provide much of the content material on which the instruction in report writing, communication and presentation skills is based.

Required Reading To be advised by lecturer.

Recommended Reading Kirkup, Les 1994, Experimental Methods – An Introduction to the Analysis and Presentation of Data, Wiley.

Class Contact Two hours per week (average) for two semesters, based on an integrated approach comprising mostly laboratory sessions, but also occasional lectures and tutorials.
Assessment: Class tests and short reports, 70%; assignments 30%.

**HHN1220 NURSING 2 - COMMUNICATION IN HEALTH**

Campus: St. Albans  
Prerequisite(s): Nil  
Co-requisite(s): Nil  
Content: This subject fosters students' understanding of factors influencing communication and facilitates the development of interpersonal communication skills relevant to a variety of settings. Topics include: conceptualising communication – the self, the dyad and the group; interpersonal communication in the health care context, non-verbal communication; communication skills – a study of communication skills in an experiential learning context including the helping skills: attending, listening and responding with empathy; beginning skills in interviewing and facilitating groups; conflict and negotiation; organisational communication in health care and other settings.  
Required Reading: To be advised by lecturer.  
Class Contact: Two hours per week for 1 semester comprising 1 one hour lecture and 1 one hour workshop.  
Assessment: Journal 30%, audiotape interview 70%.

**JCB0100 BIOLOGY**

Campus: Footscray Park, St Albans  
Prerequisite(s): Nil  
Content: This subject aims to investigate scientifically living organisms and their survival in their natural environment, developing an understanding of the biological principles involved. Develop skills necessary for the critical analysis and design of the experimental techniques, which characterise scientific enquiry. Develop the capacity to communicate biological concepts logically and effectively.  
Class Contact: Six hours per week for two semesters, including two hours of laboratory work per fortnight.  
Assessment: Semester one examination, 30%; Class work, 40%; Semester two examination, 30%.

**JCB0110 CHEMISTRY**

Campus: Footscray Park, St Albans  
Prerequisite(s): Nil  
Content: This subject investigates scientifically living organisms and their survival in their natural environment, developing an understanding of the biological principles involved. Develop skills necessary for the critical analysis and design of the experimental techniques, which characterise scientific enquiry. Develop the capacity to communicate biological concepts logically and effectively.  
Class Contact: Six hours per week for two semesters, including two hours of laboratory work per fortnight.  
Assessment: Semester one examination, 30%; Class work, 40%; Semester two examination, 30%.

**JCM0100 INFORMATION TECHNOLOGY**

Campus: Footscray Park  
Prerequisite(s): Nil  
Content: Algorithms – Algorithms in the world. Techniques used to design and represent algorithms. Examples of important algorithms. Basic problem-solving concepts (e.g. selection, iteration, recursion). Programming Languages – Introduction to specific computer language. Concept of sequence, selection and repetition. Levels of computer languages. Operating Systems and User Support – Command language and its use. Files and disk management. Telecommunications, local and wide area networks. Computer Architecture – Basic computer model (e.g. CPU, memory, I/O). Basic data representation: number us. Characters, ascii us.non ascii. Social, Ethical and Professional Context – Impact of technology on today's society. Ethics in an electronic community. Team solution of problems. Computer Applications – Computer-aided design/computer-aided manufacture. Computer speech, music synthesis and art. Database systems. Electronic mail and bulletin boards. Multimedia Presentation graphics, Scientific analysis (e.g. Mathematica, Matlab). Spreadsheets and data analysis. Work processing and desktop publishing. Additional Topics – Artificial intelligence (e.g. games, expert systems, robotics, knowledge representation). Computational science (e.g. scientific visualization, modelling). Graphics (e.g. image generation, 2 and 3D animation). Simulation and virtual reality. Software engineering (e.g. system development, software development cycle, modelling and diagramming).  
Class Contact: Six hours per week for two semesters.  
Assessment: Semester one examination, 30%; Class work, 40%; Semester two examination, 30%.

**JCM0110 MATHEMATICS**

Campus: Footscray Park, St Albans  
Prerequisite(s): Year 11 Mathematics or equivalent  
Content:  
Semester Two: Introductory Calculus: Co-ordinate geometry of the straight line. Limits and continuity. Differentiation from first principles. Derivatives of algebraic, logarithmic exponential and trigonometric functions. Product quotient and chain rules. Applications of differentiation: tangents and normals, maxima and minima, rates of change, etc. Basic rules of integration: algebraic, trigonometric and exponential functions. Integration as a process of summation. Applications. Statistics and Probability: Introductory probability including independent, mutually exclusive events, conditional probability. Data analysis. Discrete and continuous probability distributions e.g. binomial, poison, geometric normal distributions. Each topic will emphasis problem solving involving the formulation and solving of real world problems including definition of variables, writing down equations and relevant identities.  
Class Contact: Six hours per week for two semesters.  
Assessment: Semester one examination, 30%; Class work, 40%; Semester two examination, 30%.
ENGLISH LANGUAGE AND COMMUNICATION SKILLS

Campus Footscray Park, St Albans
Prerequisite(s) Nil
Content The aim of this subject is to provide students with a familiarity with and skills necessary to communicate effectively in English. The attainment of verbal and written skills will be of a high priority. Skills gained will assist students in general English communication as well as their participation in formal academic contexts. Subject content will include: verbal exchanges, development of vocabulary, grammatical structures, written communication skills, effective listening skills, reading skills, self-evaluation of communication skills and strategies for language learning.

Class Contact Six hours per week for two semesters.
Assessment Semester one examination, 30%; Class work, 40%; Semester two examination, 30%.

PHYSICS

Campus Footscray Park
Prerequisite(s) Year 11 Mathematics or equivalent

Class Contact Six hours per week for two semesters including two hours of laboratory classes per fortnight.
Assessment Semester one examination, 30%; Class work, 40%; Semester two examination, 30%.

INTRODUCTORY MANAGEMENT SKILLS

Campus Werribee
Prerequisite(s) Nil
Content The aim of this subject is to develop or improve personal skills and individuals to assist them to operate as effective managers in the modern Australian meat industry. Personal aspects covered include self awareness and life plans; analysis and management of stress, personal health and fitness and time management. A communications skills program will cover communications theory, problem solving writing, report planning, organisational communication and giving presentation skills. Skills in computing sill be developed to include an understanding of PC operations, software packages, with an emphasis on Microsoft Word and Excel, OH&S topics.

Required Reading To be advised by lecturer.
Class Contact Twelve hours per week for a five week period comprising workshops, seminars, lectures and practicals.
Assessment There is no formal examination. Performance will be assessed on assignments, report presentations, demonstration of computing skills, class participation and examinations, 50%.

THE AUSTRALIAN MEAT INDUSTRY

Campus Werribee
Prerequisite(s) Nil
Content The aim of this subject is to provide students with a working knowledge of the Australian Meat Industry in terms of an organisational structure, supply of raw material, processing capability and participation in various markets. Topics will cover three main areas. Firstly, the production of meat animals in Australia, farm management techniques, variations according to location, feed production, breed and species. Aspects of yield and quality of production is included. Secondly, the nature and structure of markets for various products locally and overseas will be examined and thirdly, the size, location, diversity and ownership of the processing sector will be covered with overseas competitors. This section also includes a coverage of the main organisations servicing the Australian Meat Industry.

Class Contact Twelve hours per week for a five week period comprising lectures, seminars and a field visit.
Assessment Assignments, case studies, 40%; reports, 20%; examination 40%.

MANAGEMENT OF EMPLOYEES

Campus Werribee
Prerequisite(s) SBF0111 Introductory Management Skills.
Content This subject is an introduction to the task of managing people on the job. It focuses on an understanding of the industrial environment and the best way of maximising performance in an acceptable and harmonious way. Topics covered include organisation, structure and development. Job analysis, position descriptions, recruitment, selection and induction of staff; performance planning and appraisal; leadership styles and interpersonal skills; participative management and conducting meetings; awards, unions and industrial relations. Advanced Computing covering the use of Powerpoint, databases, the internet and introduction to processing related software.

Required Reading To be advised by the lecturer.
Class Contact Eight to ten hours per week of lectures, case studies, workshops and laboratory work over a five week period.
Assessment Assignments, 30%; presentations, 20%; competency tests, 20%; final examination, 30%.

INDUSTRY PROJECT

Campus Werribee
Prerequisite(s) Year 1 of the Diploma of Meat Management.
Content The aim of this project is to provide an opportunity for students to apply some of the knowledge and skills learnt in the first year of the course to work-based situations. This is the first in a series of three projects which will be done in between years of the course. The first project will cover the organisation and structure of the company and its business interest; personnel and job profiles; meat supply and processing operations; products and markets etc.

Required Reading Not applicable.
Class Contact Fifteen hours on introduction, consultation and presentation of 1500-word report.
Assessment Report, 75%; oral presentation, 25%.
SBF1111 INTRODUCTORY MEAT TECHNOLOGY

Campus Werribee

Prerequisite(s) Nil.

Content The aim of this subject is to provide an understanding of the basic sciences which explain the nature of meat and meat products and changes which take place during the production, processing and storage phases. Topics covered will be drawn from three main areas. Basic Science: The nature and structure of chemical substances; chemical reactions of solids, liquids, gases; acids bases (alkalis), salts; proteins; carbohydrates (sugars) fats and alcohols; water supplies and chlorination; chemical nature of odours, smells. Laboratory exercises on the above including analyses on meat, meat products and chemicals used in meatworks. Microbiology: Nature and structure of bacteria, yeasts/moulds, and viruses; growth, reproduction and counting of micro-organisms, nutritional requirements and control of micro-organisms; groups of micro-organisms important to the meat industry; introduction to food and water-borne pathogens. Animal Biology: Classification of animals, structure of meat animals; components of animal foodstuffs; intake of food and factors affecting quantity and growth rate; the structure and functioning of the digestive system, muscles and bones; the nature and significance of fat and skin tissue; reproductive system; coordination of body functions; respiratory and cardiovascular (blood) system; metabolic processes in meat animals.


Class Contact For Microbiology and Animal Biology four hours of lectures plus six hours practical for each section weekly for a five week period. Basic Science will be four hours of lectures plus six hours of practical per week for the same period.

Assessment Assignments, 40%; practical reports, 20%; final examination, 40%.

SBF1120 MEATWORKS ENGINEERING SERVICES

Campus Werribee

Prerequisite(s) Nil.

Content Services and operations which relate to the engineering department of a meat processing works have a major influence either directly or indirectly on unit costs of production. This subject provides an introduction to basic engineering principles to help students interface better with professional engineers. It will also form the basis for further studies in meat processing and storage phases. Topics covered will include physical properties, practical applications of steam, electricity and water supply; pumping and flow measurements, machines, electrical motors, power supply, heat transfer, process flow diagrams, mass balances.

Required Reading To be advised by lecturer.

Class Contact Six hours of lectures and three hours of practicals, demonstrations, and plant visits per week for five weeks.

Assessment Assignments, 30%; practical reports, 30%; final examination, 40%.

SBF1130 INTRODUCTORY FOOD SCIENCE AND TECHNOLOGY

Campus Werribee

Prerequisite(s) Nil.

Content The aim of this subject is to provide an introduction to the Food Industry, its components and organisation, both in Australia and internationally; the composition of foods, food safety and the preservation and processing of fruits and vegetables, grains and oilseeds, dairy products, meat, poultry, fish and beverages.


Class Contact Two hours per week comprising lectures/tutorials for two semesters.

Assessment Assignments, 40%; final examinations (two), 60%.

SBF1140 NUTRITION AND SOCIETY

Campus Werribee

Prerequisite(s) Nil.

Content This subject provides a brief introduction to the principles of nutrition, food composition and the significance of food in health.

Required Reading To be advised by lecturer.


Class Contact Three hours per week comprising lectures/tutorials for one semester.

Assessment Assignments, 40%; final examination, 60%.

SBF1150 BIOLOGY 1

Campus St Albans, Werribee.

Prerequisite(s) Nil.

Content Biology of the cell. Mammalian biology with particular reference to the structure and function of various human physiological systems.

Required Reading To be advised by lecturer.


Class Contact Six hours per week for one semester comprising three hours of lectures and three hours of practical work.

Assessment Assignments, 10%; practical work, 40%; final examination, 50%.

SBF1160 BIOLOGY 2

Campus St Albans, Werribee.

Prerequisite(s) Nil.


Required Reading To be advised by lecturer.

SBF1749 BIOCHEMISTRY I (OSTEOPATHY)
Campus Footscray City, St Albans
Prerequisite(s) Normal entry requirements into the Osteopathy course.

Content Revision of basic concepts in biology and chemistry (body tissues, cells and organelles; molecules and chemical bonds, pH, redox chemistry, functional groups). Introduction to biochemistry; structure and function of molecules of life (carbohydrates, proteins, lipids, nucleic acids); vitamins – dietary requirements and their role in metabolism; effects of vitamin deficiencies; energy and nutritional requirements of the body; biochemistry of the skeletal-muscular system. Specific biochemical systems that will be studied in the first year include glycolysis, Kreb's cycle, oxidative phosphorylation, gluconeogenesis, the pentose phosphate pathway, glycogen metabolism, lipid metabolism, cholesterol transport through lipoproteins, its metabolism and role in atherosclerosis will also be discussed.

Required Reading To be advised by lecturer.


Class Contact Two semesters comprising 26 hours of lectures/tutorials plus 39 hours of practicals/workshops.

Assessment Examinations (theory and practical), 50%; tutorial participation, 10%; assignments and practical reports, 40%.

SBF2120 MEAT PROCESSING
Campus Werribee
Prerequisite(s) SBF1120 Meatworks Engineering Services. Relevant Australian Meat Courses – highly desirable.

Content This subject examines the basis for good processing practices and considers current options available for this purpose. Topics covered include: general comparison of meat processing systems locally and overseas; pre-slaughter handling and operations; animal welfare; slaughter techniques; electrical stimulation; dressing operations; carcass and offal quality assessment procedures; boning room operations; packaging, chilling (carcass and carrioned meat products). An introduction to the recognition and pathogenesis of relevant diseases and parasites in livestock. Common problems in quality of output from a works: standards, specifications and legislative requirements (AQIS, Aus Meat etc.).


Class Contact Eight hours per week for a five week period comprising lectures, plant visits and workshops.

Assessment Project, 40%; assignments and reports, 30%; final examination, 30%.
biological waste treatment. Mutagens, genetic and strain improvement.


**Class Contact** Two hours of lecture and three hours of practical work per week for one semester.

**Assessment** Based upon short tests, practical reports and an end-of-semester examination.

### SBF2210 FOOD INTERACTIONS

**Campus** Werribee

**Prerequisite(s)** SBF2410 Food Components

**Content** The aim of this subject is to provide an integrated study of food components, their interactions and the manipulation of these to enhance texture and other food attributes which influence consumer acceptance of products. Topics covered include: changes occurring during food processing; food additives; processing aids; oxidative deterioration and rancidity; anti-oxidants; colour measurement, pigments; browning reactions; natural and synthetic colourants and flavouring agents and other additives; gels, colloids, foams and emulsions; food rheology; texture modification.


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments, 40%; final examination, 60%.

### SBF2220 PRINCIPLES OF INSTRUMENTAL ANALYSIS

**Campus** Werribee

**Prerequisite(s)** SCS1003 Chemistry 1E.

**Content** This subject deals with the analysis of foods and other biological materials particularly by instrumental techniques. Topics covered include: proximate analysis of foods; food rheology, texture, viscosity and colour measurement; applications of enzyme technology in analysis; high performance liquid chromatography, gas chromatography, mass spectrometry, UV/Visible and InfraRed Spectroscopy and other advanced instrumentation.


**Class Contact** Three hours per week comprising laboratory sessions for one semester.

**Assessment** Practical skills 20%, team involvement 10%, assignments 20%, laboratory reports 50%.

### SBF2230 MEAT (BIOLOGICAL) QUALITY

**Campus** Werribee

**Prerequisite(s)** SBF1111 Introductory Meat Technology.

**Content** This subject concentrates on factors affecting the microbiological quality of meat, and considers the sources of pathogenes and contamination of public health significance. An introduction to the recognition of relevant meat safety aspects; microbial contamination of meats and sources; microbiological examination of meat, line surveys; food-borne diseases related to meat and meat products; control mechanisms and the effect of chilling/freezing; microbiology of cured meats and by-products; sampling schemes. Cleaning and sanitation; personal hygiene.

**Required Reading** To be advised by lecturer.

**Class Contact** Fifteen hours per week of lectures, practicals and demonstrations for a three-week period.

**Assessment** Assignments, 30%; practicals, 30%; final examination, 40%.

### SBF2300 MICROBIOLOGY 1

**Campus** Werribee.

**Prerequisite(s)** SBF1310 Biology 1.


**Required Reading** To be advised by lecturer.

**Class Contact** Six hours per week comprising three hours of lectures and three hours of practical for one semester.

**Assessment** Assignments, 20%; practical work, 30%; final examination, 50%.

### SBF2310 MICROBIOLOGY 2

**Campus** Werribee

**Prerequisite(s)** SBF2300 Microbiology 1.

**Content** This subject aims to build on material covered in SBF2300 Microbiology 1 to further develop the student's knowledge of microbiology. Topics include: introduction to microbial ecology, evolutionary and ecological aspects of interactions between microbes and higher organisms, microbiota associated with selected animals and plants, non-specific host defences in a range of plants and animals, entry of pathogens into a range of plant and animal hosts, pathogenic effects in a range of plant and animal hosts, clinical and diagnostic microbiology, basic principles of public health microbiology.

**Required Reading** To be advised by lecturer.
Class Contact: Six hours per week comprising two hours of lectures, three hours of laboratory work and one one-hour tutorial for one semester.
Assessment: Assignments, 20%; practical work, 30%; final examination, 50%.

SBF2311 ECOSYSTEMS
Campus: St Albans
Prerequisite(s): SBF1310 Biology 1, SBF1320 Biology 2
Content: History of ecology and systems theory. Evolutionary theory in ecology including specification, co-evolution, and kin and group selection. Population biology, including demographies and interactions between individuals (e.g. competition, predation, mutualism and parasitism). Habitat and niche. Community ecology (synchronology), including succession and individualistic models, and the definition, origins and maintenance of diversity. Ecosystem structure and function, trophic levels and biogeochemical cycles. Biomes and major life forms. Palaeoecology.
Class Contact: Five hours per week for one semester, comprising two hours of lectures, one hour of tutorial and two hours of practical, including field excursions.
Assessment: Field studies and practicals, 40%; examination, 60%.

SBF2330 CELL BIOLOGY
Campus: St Albans, Werribee.
Prerequisite(s): SBF1310 Biology 1 or equivalent.
Content: This unit complements units in Biochemistry and provides a strong foundation for students moving into areas such as: biotechnology, molecular biology, medical sciences and environmental sciences. Topics covered include: Eukaryotic cell organisation (covering all of the major organelles) and compartmentalisation; membranes and transport mechanisms; the cell surface; intracellular targeting of proteins including co-translational and post translational pathways; transport and docking of vesicles; motor proteins, movement and the cytoskeleton; communication between cells including receptors and signal transduction pathways; cell cycle and its regulation; apoptosis; the molecular basis of cancer.
Required Reading: To be advised by lecturer.
Class Contact: Four hours per week for one semester based on 3 hours of lectures and 1 hour of tutorial.
Assessment: Assignments, 40%; examination, 60%.

SBF2331 MICROBIOLOGY
Campus: St Albans
Prerequisite(s): SBF1310 Biology 1 or equivalent.
Content: This subject provides an introduction to microbiology, concentrating on the bacteria. Topics covered include: principles of microscopy; history of microbiology; structure of bacterial cells; bacterial evolution and classification; bacterial diversity; algal and protozoan diversity; viruses; bacterial growth and the factors controlling it; bacterial physiology.
Required Reading: To be advised by lecturer.

SBF2364 CONSERVATION BIOLOGY
Campus: St Albans
Prerequisite(s): SBF1310 Biology 1, SBF1320 Biology 2, SBF2311 Ecosystems, or at the discretion of the subject co-ordinator.
Content: Biodiversity definitions and status – Australian and world-wide, measurements of biodiversity presence, density, abundance, plants – practical methods of assessment including sampling and statistics, animals – practical methods of assessment including statistics, community assessment – diversity, complexity patchiness, other methods – biotech., indicator species, rapid assessment, interpretation of assessments, reliability of data, levels of significance and protective legislation, conservation of biodiversity: PHVAs action statements, historical biogeography, current biodiversity status and trends in Australia and overseas community, perceptions of biodiversity, impacts on biodiversity including social and economic factors, use of biodiversity, approaches to conserving biodiversity.
Required Reading: Class handouts and tutorial reading sheets.
Class Contact: Five hours per week for one semester, comprising three hours of lectures and two hours of practical work. A number of practical sessions will be organised into more extended field excursions.
Assessment: Practical work, 50%; examination, 50%.

SBF2372 ETHOLOGY
Campus: St Albans
Prerequisite(s): SBF1310 Biology 1 or equivalent
Required Reading: To be advised by lecturer.
Class Contact: Four hours of lectures/tutorials per week for one semester.
Assessment: Assignments, 60%; examination, 40%.

SBF2390 MOLECULAR GENETICS
Campus: Werribee
Prerequisites: SBF2520 Biochemistry 1, SBF2330 Cell Biology.
Content: Introduction to developments at the forefront of molecular biology of gene structure and function and molecular genetics. The subject will build on material covered in Biochemistry 1 and Cell Biology and strengthen the foundations for the unit 'Genetic Engineering' in the final year of the degree program. Main topics include: organisation of eukaryotic genomes including repetitive and nonrepetitive DNA sequences, multigene families, pseudogenes; organisation of prokaryotic genomes; genomic rearrangements including transposable genetic elements, retroviruses and other mechanisms, genetic rearrangements in the immune system, replication of DNA,
telomers and telomerases, methylation and imprinting of DNA, mutations and repair mechanisms, regulation of gene expression, specialised genetic systems including genes in early development, genes responsive to hormones and heat shock.

**Required Reading** To be advised by the lecturer.

**Class Contact** Four hours per week, comprising three hours of lectures and one hour tutorial, for one semester.

**Assessment** Assignment work, 40%; examination, 60%.

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**SBF2410 FOOD COMPONENTS**

**Campus** Werribee

**Prerequisite(s)** SCS1003 Chemistry 1E

**Content** The aim of this subject is to provide an integrated study of food components as a basis for further studies in nutrition and food processing. Topics covered include: food composition and classification of constituents; water in foods; structure, chemistry, stability and functional properties of proteins, carbohydrates, fats and oils, vitamins and minerals. Function of nutrients, proximate analysis of foods; the use of food composition tables.


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments, 40%; final examination, 60%.

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**SBF2420 ENVIRONMENTAL ISSUES**

**Campus** St Albans

**Prerequisite(s)** Nil

**Content** Environmental issues of population, pollution and resource depletion are viewed from local, national and global perspectives. Links between social justice and environmental issues are addressed with particular reference to developing countries. Other content includes a selection from: Environmental groups and their work. Matter, energy and ecosystems. Human population dynamics, distribution and control. Resource use and depletion, including food, energy, water, soil and minerals. Air pollution, water pollution and noise pollution. Environmental assessment techniques. Economics and environment.


**Class Contact** Five hours per week in one semester comprising lectures and tutorials.

**Assessment** Assignments, 50%; examinations, 50%.

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**SBF2432 ENVIRONMENTAL SCIENCE**

**Campus** St Albans

**Prerequisite(s)** Nil

**Content** Atmospheric Science: basic principles of atmospheric chemistry, physics and meteorology. Geoscience: fundamentals of geochemistry, geology and hydrology. Aquatic Science: freshwater and marine chemistry, aquatic systems, basic oceanography, marine/freshwater interface. Interrelationships between aquatic, atmospheric and geo-sciences.


**Class Contact** Five hours per week for one semester, comprising lectures, tutorials and practicals. The practical work for this subject is field based and will involve two half-day field trips. These are normally conducted on weekends.

**Assessment** Assignments and practical work, 40%; examination, 60%.

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**SBF2432 ENVIRONMENTAL BIOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBF1320 Biology 2, SBF2311 Ecosystems, SBF1342 Biological Diversity or at the discretion of the subject co-ordinator.

**Content** Ecophysiology and environmental biology of plants and animals (autoecology) with an emphasis on Australian ecosystems. Character and adaptations of Australian plants and animals in rainforests, sclerophyllous forests, woodlands, shrublands, grasslands, deserts, alpine and freshwater ecosystems, including soil infertility and fire. Environmental history of global change. Impact of human activities on ecosystems, including agriculture, the biodiversity crisis, endangered species, introduced species, and green house effect.

**Required Reading** Groves R.H. 1994 *Australian Vegetation*, 2nd Edition, Cambridge University Press and as advised by lecturer(s)


**Class Contact** Five hours per week for one semester comprising two hours of lectures, one hour of tutorial and two hours of practical, including field excursions.

**Assessment** Field studies (including overnight camp) and practicals, 40%; examination, 60%.

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**SBF2460 ANIMAL BIOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBF1310 Biology 1, SBF1320 Biology 2.

**Content** What is an animal? Origin of animal diversity: classification and evolutionary history. The major groups of invertebrates and vertebrates, including their structure, physiology, behaviour, ecology and developmental biology, with an emphasis on Australian examples. Basic laboratory techniques in animal biology.


**Recommended Reading** As advised by the lecturer.

**Class Contact** Five hours per week for one semester, comprising three hours of lectures and two hours of practical.

**Assessment** Assignments, 20%; practicals, 30%; final examination, 50%.

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**SBF2470 PLANT BIOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBF1310 Biology 1, SBF1320 Biology 2.

**Content** Introduction to plant physiology and anatomy, including photosynthesis, gas exchange, nutrition, xylem and phloem function, stomatal function, primary and secondary growth, meristems, hormone function and action, and cell differentiation in plant tissues. Diversity of plant life and systematic botany, including classification and phylogeny of plants, taxonomy and biological nomenclature. The major groups of algae, bryophytes, simple vascular plants, ferns, gymnosperms, and angiosperms, including their basic biology, morphological
SBF2520 BIOCHEMISTRY 1

Campus St Albans, Werribee.

Prerequisite(s) SBF1310 Biology 1; SCS1003 Chemistry 1E or equivalent.

Content This subject aims to provide a general introduction to biochemistry and includes: structure and functions of carbohydrates, lipids, proteins and nucleic acids. Biological membranes. Enzymes: kinetics and regulatory enzymes. Metabolism: bioenergetics, glycolysis, citric acid cycle, chemiosmosis, gluconeogenesis, amino acid metabolism, fatty acid metabolism, photosynthesis. DNA: structure, replication, expression, and basic gene cloning.

Required Reading To be advised by lecturer.

Class Contact Seven hours per week, comprising three hours of lectures, three hours of laboratory, and one hour of tutorial work for one semester.

Assessment Practical work, 30%; final examination, 60%; assignment, 10%.

SBF2530 BIOCHEMISTRY 2

Campus Werribee

Prerequisite(s) SBF2520 Biochemistry 1.

Content The aim of this subject is to expand on material covered in Biochemistry 1, and complement the Molecular Cell Biology and Microbiology subjects. Along with Biochemistry 1, this subject will provide a solid foundation in biochemical principles, reactions and applications. Topics covered include bioenergetics, the pentose phosphate pathway, amino acid and nucleotide metabolism, photosynthesis, aspects of plant metabolism and biochemistry of neurotransmitters. Other topics covered will include the structure and function of biological molecules, ligand binding and conformational changes, mechanisms of enzyme action, advanced enzyme kinetics, regulation of biochemical systems such as hormonal and transcriptional control. Applied aspects of biochemistry will also be considered.

Required Reading To be advised by lecturer.

Class Contact Seven hours per week, comprising three hours of lectures, three hours of laboratory work and one hour tutorial for one semester.

Assessment Tutorials and assignments, 25%; practical work (including test), 30%; final examination 45%.

SBF2740 PRINCIPLES OF FOOD PRESERVATION

Campus Werribee

Prerequisite(s) SBF1130 Introductory Food Science and Technology.


Required Reading To be advised by lecturer.


Class Contact Four hours per week comprising lectures/tutorials for one semester.

Assessment Assignments and tests, 30%; final examination, 70%.

SBF2922 SCIENCE AND SOCIETY

Campus St Albans, Werribee.

Prerequisite(s) Nil.

Content The subject aims to encourage students to appreciate modern scientific culture as an historically unique phenomenon, and thus to enable them to analyse specific developments and events in modern society. The subject looks at the failure of philosophical attempts to establish a scientific method, and explores the view that science is fantastically creative rather than ‘dull-but-honest’. Two case-studies are used: the development of Darwinism, and the transition from Newton’s theory of gravitation to Einstein’s theory of general relativity. The development of modern scientific culture is analysed in the following case studies in particular: China and Japan’s divergent
responses to confrontation with Western culture, technological developments in Nazi Germany and Stalinist Russia, the structure and funding of American basic research, and the development of the nuclear industry. The teaching of science subject and popular perceptions of science will also be looked at.


**Class Contact** Four hours per week for one semester, comprising one two-hour lecture and one two-hour tutorial.

**Assessment** Assignments, 50%; semester examination, 50%. A satisfactory assessment will require satisfactory attendance (80%) at tutorials.

**SBF3120 PRODUCT AND PROCESS DEVELOPMENT**

**Campus** Werribee

**Prerequisite(s)** Successful completion of Years 1 and 2 of the Diploma of Meat Management.

**Content** This subject looks at the value adding process for meat and meat products. It considers existing and future opportunities for new products and processes. Topics include introduction to marketing; the product development process; sensory evaluation of foods; production of smallgoods, restructured meats, cured meats; canned meats; packaging materials, systems, costs and selection criteria; meat products as ingredients for the food and pharmaceutical industries; advanced processing techniques, programmable and computer control systems; robotics (FutureTech).

**Required Reading** To be advised by lecturer.

**Class Contact** Eight hours per week for ten weeks comprising lectures, practicals and projects.

**Assessment** Assignments, 30%; projects, 50%; progressive assessments, 20%. Selection of projects will be made by students after successful completion of Year 2, and submitted for assessment and approval prior to starting Year 3.

**SBF3130 INDUSTRY PROJECT**

**Campus** Werribee

**Prerequisite(s)** Year 3 of the Diploma of Meat Management.

**Content** This subject requires students to prepare a confidential report on a new initiative or development for the Company. Alternatively, a generic assignment which relates to the industry will be advised by lecturer. Report to be finalised prior to graduation.

**Required Reading** To be advised by lecturer.

**Class Contact** Fifteen hours on introduction, consultation and presentation of a 1500–2000 word report.

**Assessment** Report, 75%; oral presentation, 25%.

**SBF3131 PLANT AND PROCESS DESIGN**

**Campus** Werribee

**Prerequisite(s)** SBF2130 Meatsworks Plant Operations.

**Content** This is a project based subject involving aspects of design, construction, equipping, costing and layout for a meatsworks or smallgoods operation. Topics include master planning; site selection and layout; building materials selection criteria, plant layout, equipment design and materials of construction; ventilation and air conditioning; design and construction of cold stores; corrosion in buildings and plant; costs and project management – critical path network; basic drafting, and use of computer aided design software; legislative requirements.

**Required Reading** SCARM, *Construction of Premises for Processing Meat for Human Consumption*, CSIRO. AQIS Construction Guidelines for Export Meatsworks, AQIS.

**Class Contact** Six hours per week for ten weeks comprising lectures, plant visits, and project work.

**Assessment** Written project, 60%; oral presentation, 20%; assignments, 20%. A choice of project will be made following successful completion of Year 2 and submitted for approval prior to starting Year 3.

**SBF3140 MANUFACTURING MANAGEMENT**

**Campus** Werribee

**Prerequisite(s)** SBF0213 Management of Employees.

**Content** The subject provides a thorough grounding in analytical techniques and financial methods required for effective management of a manufacturing process. Topics include strategic development of companies; capital budgeting and decision making; cost analysis and control options; financial management and profit; production planning and control, logistics and distribution; data capture and management information systems; computer integrated manufacture.


**Class Contact** Nine hours per week for ten weeks comprising lectures, workshops and projects.

**Assessment** Assignments, exercises, 60%; final examination, 40%.

**SBF3210 ADVANCED NUTRITION**

**Campus** Werribee

**Prerequisite(s)** SBFM2750 Nutrition or equivalent

**Content** This subject provides a study at an advanced level of the diet; energy supply and activity; nutrition throughout the lifespan and nutrition for athletes and other particular groups.


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments, 40%; examination, 60%.

**SBF3220 INDIGENOUS FOODS**

**Campus** Werribee

**Prerequisite(s)** SBF2410 Food Components

**Content** This subject discusses indigenous foods and Australian bush foods, including their potential for commercial production; as sources of anti-microbial and other functional food ingredients, their role in health and development of new applications.


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments, 40%; final examination, 60%.

**SBF3230 NUTRITION AND HEALTH**

**Campus** Werribee
Prerequisite(s) SBM2750 Nutrition or equivalent

Content This subject demonstrates the relationship between diet and human health, nutrition deficiencies, obesity, metabolism of carbohydrates, lipids and protein; role of vitamins and minerals; food allergies and intolerance.


Class Contact Three hours per week comprising lectures/tutorials for one semester.

Assessment Assignments, 40%; examination, 60%.

SBF3240 FUNCTIONAL FOODS

Campus Werribee

Prerequisite(s) SBM2750 Nutrition

Content This subject examines the role and potential of functional ingredients and foods in human nutrition; natural antimicrobial substances in human nutrition; the role of intestinal flora in human health; prebiotics, probiotics, probiotic bacteria and symbiosis.


Class Contact Three hours per week comprising lectures/tutorials for one semester.

Assessment Assignments, 40%; final examination, 60%.

SBF3250 QUALITY MANAGEMENT

Campus Werribee

Prerequisite(s) Successful completion of Years 1 and 2 of the Diploma of Meat Management.

Content This subject covers the organisational and operational aspects required for implementing a total quality management program in the meat industry. Topics include quality improvement programs, role of senior management; principles of quality assurance, statistical process control; quality standards; problem solving techniques; quality costs; preparation of quality manuals, hazard analysis (HACCP); computer software for quality assurance, statistical process control; quality standards; improvement programs, role of senior management; principles of process engineering introduced in SCS2250 Process Engineering 1, with particular reference to traditional and modern food processing operations, and to introduce students to the design and construction concepts and principles for plant and factory operation. The subject includes: evaporation; drying of goods for medical, agricultural and other uses.


Class Contact Six hours per week for ten weeks comprising lectures, workshops, and practical exercises.

Assessment Preparation of a quality manual, 40%; assignments and tests, 20%; final examination, 40%.

SBF3251 BIOPROCESSING TECHNOLOGY 1

Campus Werribee

Prerequisites SBF2300 Microbiology 1; SBF2520 Biochemistry 1; or equivalents

Content This unit focuses on the application of microbiology to the production of goods for medical, agricultural and other uses. Topics covered include principles of biochemical engineering; fermentation technologies: batch and continuous; bioreactor design and applications; scale-up in bioprocessing technologies; harvesting and purification of bioproducts; filtration systems; downstream processing.

Required Reading To be advised by lecturer.

Class Contact Eight hours per week comprising 3 hours of lectures and 5 hours of laboratory/tutorial work for one semester.

Assessment Assignments, 20%; practical work, 30%; final examination, 50%.

SBF3252 BIOPROCESSING TECHNOLOGY 2

Campus Werribee

Prerequisite(s) SBF2300 Microbiology 1.

Co-requisite(s) SBF2520 Biochemistry 1.

Content The aim of this subject is to provide further studies in bioprocessing technology and will include: tissue and cell culture, plant products, monoclonal antibodies and their uses in biotechnology, enzyme engineering, use of immobilised cell and enzyme systems, biomass conversion and fuel production, algal biotechnology, quality assurance.

Required Reading To be advised by lecturer.

Class Contact Eight hours per week, comprising three hours of lectures and five hours of laboratory/tutorial work for one semester.

Assessment Assignments, 20%, practical work, 30%; final examination, 50%.

SBF3260 PROCESS ENGINEERING 2

Campus Werribee

Prerequisite(s) SCS2250 Process Engineering 1.

Content The subject aims to develop and apply the physical principles of process engineering introduced in SCS2250 Process Engineering 1, with particular reference to traditional and modern food processing operations, and to introduce students to the design and construction concepts and principles for plant and factory operation. The subject includes: evaporation; drying of liquids and particulates; thermal processing; membrane filtration; electrodialysis; ion exchange; freezing and freeze concentration; plant and factory design and construction; materials and services; cleaning, disinfection and sterilisation; water and effluent treatment; costing.

Required Reading To be advised by lecturer.


Class Contact Six hours per week for one semester comprising lectures and tutorials.

Assessment Assignments, 40%; final examination, 60%.

SBF3320 REHABILITATION AND RESTORATION

ECOLOGY

Campus St Albans

Prerequisite(s) SBF2311 Ecosystems, SBF 2452 Environmental Biology, SBF2311 Microbiology

Content Current conservation status of bioregions and their representations in parks and reserves, principles & practices of recovery of species and communities, effects of fragmentation; ways of viewing fragmented communities, weed growth and control – problems & opportunities, freshwater & wetland communities – establishment, recovery & management, succession, three type strategists & competition theory - ways of viewing change during restoration, ecological models & strategies
for managing remnant populations and communities, long-term ecological change - effects on remnant & degraded communities, purposes and limitations of restoration ecology - including insights into how ecosystems function, future of restoration ecology.


**Class Contact** Six hours per week involving three hours of lectures and three hours of practical, including field excursions and practical workshops.

**Assessment** Field studies and practicals, 50%; examination, 50%.

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**SBF3321 RENEWABLE RESOURCE MANAGEMENT**

**Campus** St Albans

**Prerequisite(s)** SBF2311 Ecosystems

**Content** Renewable and non-renewable resources. Distributional pattern and supply of renewable resources. Agriculture and forestry management. Wildlife and rangeland management. Fisheries resources and aquaculture management. Conservation and endangered species. Remote sensing and Geographic Information Systems (GIS) and their use in renewable resources management.

**Required Reading** To be advised by lecturer.

**Class Contact** Four hours of lectures and tutorials per week for one semester and one whole day field excursion, which may be held on a weekend.

**Assessment** Assignments, 20%; final examination, 70%; excursion reports, 10%.

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**SBF3330 FOOD SCIENCE ETHICS**

**Campus** Werribee

**Prerequisite(s)** SBF1130 Introductory Food Science and Technology

**Content** This subject discusses the ethical issues relevant to food production, processing and marketing, including the conduct of research and development activities; competition and fraud in food production and marketing; toxicochemical evaluation of additives and ingredients.

**Required Reading** Nil


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments, 40%; final examination, 60%.

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**SBF3343 MARINE AND FRESHWATER ECOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBF1310 Biology 1; SBF1320 Biology 2; SBF1342 Biological Diversity; SBF2311 Ecosystems or at the discretion of the Course Co-ordinator.

**Content** Physical and biological characteristics, classification and ecology of marine and freshwater systems. Classification, biology and ecology of aquatic organisms with an emphasis on community structure and the interaction between organisms/populations-communities and the physical environment. Dynamics of aquatic systems, food chains and the processing of organic material within such systems. Long-term effects of anthropogenic activities on aquatic systems. Management practices.


**Class Contact** Six hours per week involving three hours of lectures and three hours of practical, field work will constitute a major portion of the practical component, day and/or overnight.

**Assessment** Practicals and assignment work, 40%; examination, 60%.

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**SBF3382 INTRODUCTION TO MOLECULAR BIOLOGY AND BIOTECHNOLOGY**

**Campus** Footscray Park

**Prerequisite(s)** SBF2192 Applied Microbiology; SCS2381 Biochemistry I.

**Content** This subject will cover current knowledge about genes (what they are, how they work and how they are manipulated), and examine various techniques used to study and manipulate genes. Topics include: the function of genes, the chemical identification, structure and properties of genes, strategies used by nature or developed in the laboratory for manipulating genes and specific uses of laboratory based gene manipulation.

**Required Reading** To be advised by the lecturer.

**Class Contact** Two hours of lectures per week and two hours of practicals on alternate weeks.

**Assessment** Short tests, practical reports and end-of-semester examination.

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**SBF3400 MICROBIAL ECOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBF2331 Microbiology 1 or equivalent.

**Content** Diversity of environmental microbes (viruses, bacteria, algae, fungi); Ecological interactions among microbes; Ecological interaction of microbes with 'higher' organisms; Microbiology of ecosystems; Microbiology of sustainable development: microbiology and environmental pollution, novel approaches to pest control; microbiology of wastes.


**Class Contact** Four hours per week.

**Assessment** Assessment will be ongoing via three sets of activities. Essay and literature review, 20%; Report on field excursion, 20%; three tutorial assessments 60%.

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**SBF3455 ECOTOXICOLOGY & POLLUTION BIOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBF1310 Biology 1; SBF1320 Biology 2; Biometrics & Experimental Design; Core second year subjects; or at discretion of co-ordinator.
Content Basic principles and concepts in ecotoxicology; description and issues associated with hazardous and toxic substances in common use; sources of environmental contamination; symptoms and disorders resulting from exposure. Experimental methodology employed in evaluation of (eco)toxicity; methods and statistics used in quantification of toxic response. Mechanisms of organismic deputation and biotransformation. Ecosystem responses to pollution/toxicant exposure, fate and partitioning of exogenous compounds in the environment; pollution induced changes at organismic through ecosystem level. Population, community and ecosystem effects, transportation sequestering and accumulation in natural systems; biomagnification and trophic magnification. Tolerance and susceptibility of biological systems to pollutants; pollution monitoring; biological indicators of pollution induced environmental stress; case studies.


Class Contact Six hours per week for one semester, comprising three hours of lectures and three hours of practical per week. Some field work will be required in this subject.

Assessment Practical/field work, 40%; examination, 60%.

SBF3510 PREPARATIVE AND ANALYTICAL BIOCHEMISTRY

Campus Werribee
Prerequisite(s) SBF2520 Biochemistry 1.

Content This subject will further develop the students' biochemical skills and focus on preparative and analytical techniques including organ, tissue and cell preparation; choice of extraction medium including choice of buffer, cofactors, etc; centrifugation; analytical and preparative chromatography, electrophoresis; a broad range of preparative and analytical techniques including GC and HPLC; spectroscopy; qualitative and quantitative use of radioisotopes, scintillation counting, fluorography and autoradiography, use of physical biochemical techniques to determine protein structure; DNA profiling; techniques to determine differential gene expression, bioinformatics (use of computer databases and analysis of gene and protein sequences).

Required Reading To be advised by lecturer.

Class Contact Eight hours per week, comprising three hours of lectures and five hours of laboratory work for one semester.

Assessment Assignments 20%; practical work (including test), 40%; final examination 40%.

SBF3530 ENVIRONMENTAL PHILOSOPHY

Campus St Albans
Prerequisite(s) Nil.

Content Philosophy: a brief overview of Ancient, Medieval and Modern Western philosophy. Environmental Philosophy as the search for principles for guidance in conducting our lives in a practical way that is beneficial to the environment and as a spectrum of thought from Anthropocosmism to Ecocentrism. A focus on Ecocentrism, in particular what informs Deep (or Transpersonal) Ecology and the role of nature-based religions and patriarchy in the development of Ecofeminism.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester

Assessment Assignments, 50%; examination, 50%.

SBF3540 LEADERSHIP AND THE ENVIRONMENT

Campus St Albans
Prerequisite(s) Nil.

Content Three phases in the history of leadership studies: the characteristics or traits of leaders from studies done in the first half of this century; the thirty years of theories of what would lead to effective leader behaviour in certain situations; the 1980's and after when a broader picture of what might explain leader success began to develop. The current place of ethics, morals, values, feelings and power as sources of information regarding leader behaviour. Leadership as an art and as a service – as a weaving of relationships rather than an amassing of information. The strong links which exist between holistic environmentalism and emerging leadership theory. Case studies from business, government and environmental organisations of successful leaders who show evidence of wholeness, care and service for the other.

Required Reading To be advised by lecturer.

Class Contact Three hours per week.

Assessment Assignments, 50%; examination, 50%.

SBF3730 FOOD MICROBIOLOGY

Campus Werribee
Prerequisite(s) SBF2300 Microbiology 1.

Content The aim of this subject is to develop and increase the student's knowledge and skills in microbiology with particular reference to the role of micro-organisms in food processing, food spoilage and food-borne disease. Topics include: characteristics of major groups of micro-organisms of importance in foods; ecology of food spoilage. Microbial growth in foods; microbial fermentation and fermented products; biomass; waste treatment; food-borne infections and food poisoning; control and prevention of food-borne disease; hygiene and sanitation; mycotoxins; legislation and standards will be covered.


Class Contact Six hours per week for one semester comprising lectures, tutorials and practical work.

Assessment Assignments, 15%; practical work, 25%; final examination, 60%.

SBF3731 ANIMAL FOOD PROCESSING

Campus Werribee
Prerequisite(s) SBF2410 Food Components, SBF2210 Food Interactions

Content World animal food resources: nature, distribution and production. Meat and Meat Products: muscle composition, structure and conversion to meat, post mortem glycolysis and meat quality, nutritional and sensory properties, chilling, freezing, curing and processing. Marine products: composition, structure, quality, spoilage, preservation and processing including chilling, freezing, salting, drying, smoking and fermenting. Milk and Milk Products: composition, chemical and physical properties of milk processing of milk including butter, powdered, fermented and fractionated product manufacture, by-product utilisation. Egg
and Poultry Products: structure and composition of egg, storage and preservation of eggs, egg products, poultry processing and poultry products.


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments and tests, 40%; final examination, 60%.

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**SBF3732 PLANT FOOD PROCESSING**

**Campus** Werribee

**Prerequisite(s)** SBF2410 Food Components; SBF2210 Food Interactions


**Class Contact** Three hours per week comprising lectures/tutorials for one semester.

**Assessment** Assignments and tests, 40%; final examination, 60%.

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**SBF3733 ANIMAL FOOD PROCESSING LABORATORY**

**Campus** Werribee

**Prerequisite(s)** SBF3731 Animal Food Processing

**Content** A program of laboratory and pilot plant exercises and industry visits designed to illustrate the principles and procedures of plant food processing and preservation and to investigate the factors that affect the quality of food during handling, processing and storage.

**Required Reading** There are no prescribed texts for this subject.

**Class Contact** Four hours per fortnight of practical work and industry visits for one semester.

**Assessment** Practical skills 20%, team involvement 10%, practical work and industry visits 70%.
SBF3770 BUSINESS ENVIRONMENT STUDIES

Campus Werribee

Prerequisite(s) Nil.

Content This subject aims to introduce students to some fundamental aspects of organisations and the business environment, in particular to enhance their understanding of accounting, marketing and organisational structures and behaviour. This subject covers: accounting and costing; analysis and interpretation of financial statements; elements of costs; cost behaviour; cost analysis; costs and decision making; budgeting; capital budgeting. Management: types of organisations; management theories; motivation; individual, inter-personal and group dynamics; industrial relations case studies. Marketing: the marketing concept; business environment and marketing; marketing research; marketing strategies; elements of marketing mix; evaluation processes; contemporary issues and business ethics; case studies.

Required Reading To be advised by lecturer.

Class Contact Six hours per week for one semester comprising lectures and tutorials.

Assessment Class presentation, 10%; syndicate exercise, 20%; report, 20%; final examination, 50%.

SBF3900 PROJECT - FOOD TECHNOLOGY

Campus Werribee

Prerequisite(s) Students would normally be expected to have successfully completed all Year 1 and 2 subjects.

Content The subject aims to enable students to become competent in applying research methodology to a specific problem and to enable them to develop an area of personal interest relevant to their degree specialisation. This subject covers project methodology, experimental design and analysis, and research plan preparation. The project will be, as far as is possible, concerned with a real problem and will require the presentation of an oral and written report and may form all or part of a research publication. The project will be chosen by the student in consultation with staff members.

Required Reading There are no prescribed texts for this subject.

Class Contact Eight hours per week for one semester comprising lectures, tutorials and practical work.

Assessment A choice of research project will be made halfway through semester five and an assignment concerned with establishing the methodology for this project will be assessed and will contribute 20% to the overall assessment of the project. The written project will contribute 60% and the oral presentation will contribute 20% to the overall assessment.

SBF3910 PROJECT - BIOTECHNOLOGY

Campus Werribee

Prerequisite(s) Successful completion of Years 1 and 2 is normally required.

Content This subject provides students with the opportunity to develop skills in applying research methodology to a specific problem and enabling them to develop an area of personal interest relevant to the degree specialisation. The subject covers project methodology, experimental and analysis design and research plan preparation. A project will be selected by the student in consultation with staff members and will, as far as is possible, be concerned with solving a real-life problem. The project will require the presentation of an oral and written report and may form part of a research publication.

Required Reading To be advised by the lecturer.

Class Contact Eight hours per week for one semester comprising lectures, tutorials and laboratory work.

Assessment Assignment, 20%; oral presentation, 20%; project report, 60%.

SBF3920 BIO METRICS AND EXPERIMENTAL DESIGN

Campus St Albans

Prerequisite(s) SMA1110 Mathematics 1, SMA1120 Mathematics 2, Core second year subjects; or at discretion of subject co-ordinator.

Content Revision of statistical concepts and the significance of statistics/biometrics in biological/environmental analysis. Trend analysis and the use of correlation and regression in developing hypotheses; distributions and the nature of biological/environmental data. Sampling regimes and units, hypothesis testing, parametric versus non-parametric testing and assumptions; post-hoc testing. Experimental design for environmental surveys and experimental programs; type-I versus type II errors, statistical power and the use of power in experimental design; BACI designs and utilisation of adequate controls in experimental procedures; true replication versus pseudoreplication. Optimisation of experimental design for a given sampling unit and variance; confounding variables. Multiple factor design for a given sampling unit and variance; confounding variables. Multiple factor designs, univariate techniques versus multivariate techniques in environmental programs.

Required Reading To be advised by the lecturer.


Class Contact Six hours per week for one semester comprising three hours lectures and three hours practical or tutorial as indicated.

Assessment Practical/tutorial exercises, 40%; examination, 60%.

SBF4000 SCIENCE HONOURS

Campus St Albans, Werribee

Prerequisite(s) Satisfactory completion of an undergraduate degree program with a credit average in the final year.

Content The program will consist of a research project and a coursework component. The major focus of the course component is research methodology and subjects include experimental design, statistics in research, data analysis, computer applications and software, literature analysis and critical appraisal, ethics in research, scientific writing and data presentation. The research project will be undertaken in one of the research areas of the School and may, subject to approval, be undertaken at an external location.

Required Reading To be advised by the lecturer.

Class Contact An average of 20 hours per week for two semesters.

Assessment The nature of the coursework assessment will vary and may be based on written assignments, seminar presentations and a written examination. The research project assessment will consist of an oral presentation and submission of a thesis.
SBM1100 FOUNDATIONS IN BIOMEDICAL SCIENCE  
Campus St Albans  
Prerequisite(s) Nil.  
Content Introduces basic study principles and skills as they relate to Biomedical Sciences. In particular the role of mathematics, computing, statistics and laboratory exercises in biomedical sciences will be examined. Students will be encouraged to develop communicative, organisational, problem-solving and team-work skills and begin to formulate a skills portfolio for future employment.  
Required Reading The focus of this subject will be on enhancing life long learning skills in particular, student ability to use print based and electronic information systems to assist in solving problems.  
Class Contact The equivalent of six hours per week. Three hours of lectures and three hours of laboratory exercises.  
Assessment Progressive laboratory assessment tasks, 50%; one examination 50%.  

SBM1171 APPLIED NEUROMUSCULAR PHYSIOLOGY  
Campus Footscray Park  
Prerequisite(s) Nil.  
Content Students will gain an appreciation of those aspects of nerve and muscle function which form the basis of human movement. Topics will include: basic cell concepts, energy systems, physiology of the neuron, structure and function of muscle fibres control of muscle contraction; sensory mechanism, higher functions of the nervous system.  
Required Reading To be advised by the lecturer.  
Class Contact Two hours of lectures and two hours of laboratory class or tutorial per week for one semester.  
Assessment Tutorial preparation, topic tests and a final examination.  

SBM1172 INTRODUCTION TO HUMAN PHYSIOLOGY  
Campus Footscray Park/St Albans  
Prerequisite(s) Nil.  
Content The general aim of the subject is to give students an understanding of basic concepts in human physiology. The subject will comprise a description of basic cell structures and functions for generalised and specialised cells; outline co-ordinated body functions with specific applications to the cardiovascular, respiratory, musculo-skeletal, neural, alimentary and renal systems. In addition, basic concepts in organic metabolism and energy balance will be considered.  
Class Contact Three hours per week for one semester comprising 2 one-hour lectures per week and a two hour laboratory session every second week.  
Assessment Practical 20%; topic tests 20%; examination 60%  

SBM1510 HUMAN BIOSCIENCE 1A  
Campus St Albans  
Prerequisite(s) Nil  
Content This unit provides a basic knowledge and understanding of human cells, tissues and organ systems. It also introduces chemical and physical principles and relates these principles to the human body. Concepts of physiological regulation and homeostasis are discussed and applied to functions of body systems. This subject provides an overview of the structure and function of the human body.  
Required Reading To be advised by lecturers.  
Class Contact Eight hours per week comprising four hours lectures, two hours laboratory and two hours tutorial.  
Assessment Tests and examinations, 55%; laboratory reports, laboratory tests and assignments, 45%.  

SBM1514 FUNCTIONAL ANATOMY 1 (UPPER & LOWER LIMBS)  
Campus St Albans  
Prerequisite(s) Nil  
Content This subject introduces students to functional anatomy. After a brief introduction to the bones, joints, muscles, vessels and nerves of the body; students study gross anatomy using a regional approach. The following regions are studied in detail: pelvic girdle, gluteal region, hip, thigh, knee, leg, ankle and foot; pectoral girdle, shoulder, arm, elbow, forearm, wrist and hand. The relevance of functional anatomy to health and healing will be highlighted by introducing students to gross anatomy, using models and wet specimens, cross-sectional anatomy using x-rays and scans; surface anatomy; acupoint anatomy; kinesiology, gait analysis, posture, massage, muscle testing, exercise, stretching and awareness through movement and posture techniques. Topics studied in this subject may be interchanged with those of the subject Functional Anatomy 2.  
Class Contact Six hours per week for one semester; 3 hours lecture, 3 hours practical/tutorial  
Assessment Theory examination 55%, practical examination and oral examination 45%  

SBM1515 ANATOMY AND PHYSIOLOGY 1  
Campus St Albans  
Prerequisite(s) Nil  
Content The subject content includes the following: Biomedical Technology; Basic structure and organisation – cells and tissues, basic chemistry, organs; Homeostasis – fluid and electrolyte balance, chemical balance, metabolic balance; Skeletal System; Muscular system; Nervous system.  
Required Reading Van De Graff, K. and Fox, S., 1995, Concepts of Human Anatomy and Physiology, 4th edn, Wm C Brown, USA.  
Class Contact Four hours per week for one semester consisting of lectures, tutorials and laboratory work.  
Assessment Two examinations, 35% each; one assignment, 20%. A pass must be gained in each component of assessment.  

SBM1517 BIOSCIENCE I: THE HEALTHY HUMAN
BODY

Campus St Albans

Prerequisite(s) Nil.

Co-requisite(s) HHN1210 Nursing 1: Health Assessment; HHN1220 Nursing 2: Communication in Health.

Content In this subject the human biosciences will be introduced and placed in context with nursing. Anatomy, physiology and basic concepts in chemistry and microbiology will be taught in an integrated fashion. The bones, joints and muscles of the body are taught in an integrated way using a regional approach. Basic concepts in chemistry are covered, providing the groundwork to support an understanding of the various types of cells within the body and their functions. Students are also introduced to microbiology which is placed in context with infection control. The importance of homeostasis and the role of the neuro-endocrine system in maintaining equilibrium within the body is emphasised. The nervous system and endocrine system are introduced in an integrated way to highlight their regulatory role for control, co-ordination and communication. Homeostasis via sensations, integration and response to changes, both within the body and in the outside environment. The physiology of nerve cells will be introduced. This will be followed by a discussion of special senses, in particular sight, hearing and balance. Topics studied in this subject may be interchanged with those of SBM1527 Bioscience 2: The Healthy Human Body.


Class Contact Seven hours per week (four hours of lectures and three hours of practical/tutorial class) for eleven weeks

Assessment Practical test, 30%; assignment and practical reports, 20%; test and examination, 50%.

SBM1518 HUMAN PHYSIOLOGY 1

Campus St Albans

Prerequisite(s) Nil.

Content The importance of homeostasis and the role of the neuro-endocrine system in maintaining equilibrium within the body is emphasised. The nervous system and endocrine system are introduced in an integrated way to highlight their regulatory role for control, co-ordination and communication. The nervous system will be represented as the body’s most rapid means of maintaining homeostasis via sensations, integration and response to changes, both within the body and in the outside environment. The physiology of nerve cells will be used to introduce bioelectrical concepts. This will be followed by a discussion of special senses, in particular sight, hearing and balance. This subject introduces students to neurotransmitters, agonists and antagonists. Basic concepts in chemistry are covered. This provides the groundwork to support an understanding of the various types of cells within the body and their functions. The musculoskeletal system is covered. Topics covered in this subject may vary slightly, depending on electives taken by students from the three biomedical streams. Topics studied in this subject may be interchanged with those of SBM1528 Physiology 2.


Class Contact Six hours per week for one semester, comprising four hours of lectures and two hours of practical/tutorial class per week.

Assessment Practical reports/test and assignment/worksheets, 45%; test/examination, 55%.

SBM1520 HUMAN BIOSCIENCE 2A

Campus St Albans, Werribee

Prerequisite(s) Students would normally be expected to successfully complete SBM1510 Human Bioscience 1A.

Content This subject aims to enable the students to extend theoretical knowledge of normal human structure and function developed in SBM1510 Human Bioscience 1A by examining more complex integrated functioning of the various systems in health and comparing these with selected deviations from health. Students will be introduced to fluid and electrolyte dynamics, the role of membrane structures and capillary dynamics, and integration of the neural, endocrine, circulatory, respiratory, and renal sub-systems in maintaining fluid, electrolyte and acid-base balance. Metabolism, body temperature control and nutrition are examined. Microbiology is introduced.

Required Reading To be advised by lecturer.

Class Contact Seven hours per week comprising three hours of lectures, two hours of laboratory and two hours of tutorials for one semester.

Assessment Test and examination, 55%; laboratory reports and assignments, 45%.

SBM1524 FUNCTIONAL ANATOMY 2 (HEAD, NECK AND TRUNK)

Campus St Albans

Prerequisite(s) SBM1514 or equivalent

Content The following regions are studied in detail: skull and cranial cavity, scalp and face, eye and ear, nasal and oral cavities, major structures of the neck, deep and superficial structures of the back, thoracic wall, cavity and contents, abdominopelvic wall, cavity and contents. As with Functional Anatomy 1, the relevance of anatomy to health and healing will be highlighted. Topics studied in this subject may be interchanged with those of the subject Functional Anatomy 1.


Class Contact Six hours per week for one semester; 3 hours lecture, 3 hours practical/tutorial

Assessment Theory examination 55%, practical examination and oral examination 45%.

SBM1525 ANATOMY AND PHYSIOLOGY 2

Campus St Albans

Prerequisite(s) SBM1515 Anatomy and Physiology 1

Content The aim of this subject is to build upon the introductory knowledge of human structure and function covered in ‘Anatomy and Physiology 1’ in order for students to gain an integrated understanding of human organs and body systems. The subject content includes the following:- Endocrine system; Cardiovascular system; Lymphatic system; Respiratory system; Digestive system; Urinary system; Reproductive system; Immune system.

Required Reading Van De Graaff, K. and Fox, S., 1995, Concepts of Human Anatomy and Physiology, 4th edn, Wm C Brown, USA.
of how homeostatic mechanisms regulate variables such as blood pressure, blood gas status, acid-base balance, fluid and electrolyte balance and blood glucose. The provision of nutrients to the body by the gastrointestinal system is integrated with the study of biochemistry and metabolism. An introduction to basic concepts of inheritance is followed by the study of the male and female reproductive systems. Topics studied in this subject may be interchanged with those of SBF1518 Physiology 1.

**Recommended Reading**

**Class Contact**
- Six hours per week for one semester, comprising four hours of lectures and two hours of practical/tutorial class.

**Assessment**
- Practical reports/test and assignment/worksheets, 45%; test/examination, 55%.

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**SBM1529 INTRODUCTION TO PLANT SCIENCE**

**Campus** St Albans

**Prerequisite(s)** Nil.

**Content**
- Plant morphology and internal anatomy of stem, root and leaves; cell structures and contents; parts of flowers and fruits and their variations; Basic taxonomy, orders and families of selected Chinese medicinal plants; Basics of the origin and distribution of primary and secondary metabolites.

**Required Reading**

**Recommended Reading**

**Class Contact**
- The equivalent of 40 hours for one semester comprising lectures, tutorials, laboratory sessions and field trips.

**Assessment**
- Lab reports, 10%; Field Trip report, 10%; Practical examination, 20%; Final examination, 60%. A pass must be gained in each component of assessment.

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**SBM1570 BIOLOGY 1**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content**
- The importance of homeostasis and the role of the neuro-endocrine system in maintaining equilibrium within the body is emphasised. The nervous system and endocrine system are introduced in an integrated way to highlight their regulatory role for control, co-ordination and communication. The nervous system will be represented as the body’s most rapid means of response to changes, both within the body and in the outside environment. The physiology of nerve cells will be used to introduce bioelectrical concepts. This will be followed by a discussion of special senses, in particular sight, hearing and balance. This subject introduces students to neurotransmitters, agonists and antagonists. This provides the groundwork to support an understanding of the various types of cells within the body and their functions. The musculoskeletal system is covered, The subject continues with the study of the structure and functions of the body, using homeostatic regulation of the internal environment as the ongoing theme. The cardiovascular,
respiratory, urinary, gastrointestinal and reproductive systems are placed in context with their overall regulation and co-ordination via the neuro-endocrine system. This provides an understanding of how homeostatic mechanisms regulate variables such as blood pressure, blood gas status, acid-base balance, fluid and electrolyte balance and blood glucose. The provision of nutrients to the body by the gastrointestinal system is integrated with the study of biochemistry and metabolism. An introduction to basic concepts of inheritance is followed by the study of the male and female reproductive systems.


**Class Contact** Four hours per week for two semesters, comprising three hours of lectures per week and two hours of practical/tutorial class every second week.

**Assessment** Practical reports/test and assignment/worksheets, 45%; test/examination, 55%.

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**SBM1572 BODY CONTROL MECHANISMS**

**Campus** St Albans

**Prerequisites** SBM1514 Functional Anatomy 1 (Acupuncture) and SBM1524 Functional Anatomy 2 (Acupuncture)

**Content** The importance of homeostasis and the role of the neuro-endocrine system in maintaining equilibrium within the body is emphasised. The nervous system and endocrine system are introduced in an integrated way to highlight their regulatory role for control, coordination and communication. The cardiovascular, respiratory and urinary systems are placed in context with their overall regulation and coordination via the neuro-endocrine system. This provides an understanding of how homeostatic mechanisms regulate variables such as blood pressure, blood gas status, acid-base balance, fluid and electrolyte balance and blood glucose. This subject introduces students to basic principles in pharmacology.


**Class Contact** Three hours per week for two semesters.

**Assessment** Examination/test 75%; test/assignment/worksheets 25%.

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**SBM2260 DIET AND NUTRITION**

**Campus** St Albans

**Prerequisite(s)** SBM1528 Human Physiology 2 or equivalent

**Content** This subject will demonstrate the relationships between gastrointestinal function, diet and human health. The subject examines the gastrointestinal structure and function, body composition, anthropometry, chemical nature of the nutrients, and their roles in body structure and function, energy intake and regulation, metabolism of nutrients, nutritional requirements under various environmental and physiological states, diet and disease, dietary guidelines, hormonal control of digestion, vitamins as antioxidants, nutrition and prevention of disease, role of intestinal flora in nutrition.

**Required Reading** To be advised by lecturer.

**Class Contact** Six hours per week for one semester comprising three hours lecture, two hours laboratory and one hour tutorial.

**Assessment** Tests, 20%; laboratory reports, 30%; final examination, 50%.

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**SBM2360 INTRODUCTION TO MICROBIOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBM1524 Functional Anatomy 2 or SBM1520 Human Bioscience A or equivalent

**Content** Topics include: nature and classification of microorganisms and their growth requirements; normal flora; host defence mechanisms, immunoreponse, host microbe interaction, infection, sterilisation, disinfection, asepsis, antisepsis; sources and mode of transfer of infectious agents and the compromised host, principles of safe clinical practice, antibiotics, epidemiology, analytical methods and food safety. To investigate application of micro organisms in industry and biological work products.


**Class Contact** Three hours per week for one semester, 1-2h lectures, 1-2h tutorial/laboratory

**Assessment** Assignments and laboratory reports 40%; end of semester examination 60%.

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**SBM2361 EPIDEMIOLOGY**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** This unit will introduce basic concepts of epidemiology. It will describe types of epidemiological study, the research design and the advantages and disadvantages of each study type and covers the measurement of indicators of disease. Other topics covered include reviewing studies that show the causative factors relating to specific diseases; measurement of the association between causative factors and disease; the advantages and disadvantages of different types of epidemiological study; epidemiological findings to show the degree of risk associated with exposure to specific hazards in industry; and the impact of chance, bias and confounding on findings of epidemiological studies.


**Class Contact** One hour per week for one semester.
Assessment Assignments, 40%; case study, 60%.

**SBM2515 FUNCTIONAL ANATOMY**

**Campus** St Albans  
**Prerequisite(s)** SBM1525 Anatomy and Physiology 2  
**Content** The revision of the gross anatomy of areas considered ‘dangerous to needle’; the functional dimension of the musculoskeletal system; the role of other physiological systems in the maintenance and performance of the musculoskeletal system. In understanding the relevance of functional anatomy to health and healing students will also be introduced to kinesiology, biomechanics, muscle testing, and posture awareness through Feldenkrais and Alexander techniques.


**Class Contact** The equivalent of two hours per week over two semesters consisting of lectures, tutorials and workshops.

**Assessment** One workshop report, 50%; and one examination, 50% for each of the two semesters over which the subject will run.

**SBM2516 BIOSCIENCE 3: DEVIATION FROM HEALTH**

**Campus** St Albans  
**Prerequisite(s)** SBM1527 Bioscience 2: The Healthy Human Body.

**Content** The presentation of major concepts and principles of pathophysiology illustrating their relationship to a range of common/important acute and chronic illness. This subject supports the topics in concurrent nursing units by providing a scientific basis for understanding disease processes such as cellular injury, inflammation, infection, and shock; by elucidating the underlying mechanisms which results in clinical manifestations; and by presenting the rationale for therapeutic interventions. Pharmacological concepts such as route of administration, distribution, metabolism and excretion of drugs will be discussed. The main classes of therapeutic drugs and their mode of action will be outlined. Microbiology will be discussed with reference to the growth and physiology of micro-organisms, their pathogenic potential, infection control and antibiotic treatment. The pathophysiological principles underlying disorders of major body systems and subsystems will be discussed; for example, in cardiovascular pathophysiology, shock, cardiac failure, hypertension and atherosclerosis will be examined. Other topics covered may include haematology, the respiratory system, renal system, and fluid and electrolyte imbalances, however specific systems in this subject may be interchanged with those in the fourth semester subject as appropriate.


**Class Contact** Five hours per week (3 hours of lectures and two-hours of tutorial/laboratory) for eleven weeks.

Assessment Assignment and tutorial/laboratory reports, 40%; examination, 60%.

**SBM2524 FUNCTIONAL ANATOMY 3**

**Campus** St Albans  
**Prerequisite(s)** SBM1524.

**Content** The relevance of functional anatomy to health and healing will be highlighted by studying to clinical anatomy, kinesiology, biomechanics, gait analysis, posture, massage, muscle testing, exercise, stretching, basic soft tissue techniques, and awareness through movement and posture. There will be a particular emphasis on muscle testing and surface anatomy. Topics studied in this subject may be interchanged with those of the subject SBM1514 Functional Anatomy 1 and SBM1524 Functional Anatomy 2.


**Class Contact** Sixteen hours for one semester.

**Assessment** Theory examination 55%, practical examination and oral examination 45%.

**SBM2526 BIOSCIENCE 4: DEVIATION FROM HEALTH**

**Campus** St Albans  
**Prerequisite(s)** SBM2516 Bioscience 3

**Content** This subject further the understanding of pathophysiological principles and disease processes introduced in SBM2516 Bioscience 3: Deviation from Health. These will include neoplasia, the adaptive immune response (immunisation, hypersensitivity, immune deficiency, auto-immunity), and endocrine disorders such as diabetes mellitus. Further pathophysiology, and musculoskeletal pathophysiology of specific systems will be discussed, for example, neurological disorders and gastric intestinal tract. But this content may be interchanged with systems listed in the third semester subject. Disorders of the reproductive tract including infertility will be presented. The normal functioning of the reproductive system in pregnancy will be discussed together with embryological development. Important genetic disorders such as cystic fibrosis and their modes of inheritance will be examined.


**Class Contact** Five hours per week (3 hours of lectures and two hours of tutorial/laboratory) for eleven weeks.

**Assessment** Assignment and tutorial/laboratory reports, 40%; examination, 60%.

**SBM2530 PATHOPHYSIOLOGY 1 (HUMAN BIOSCIENCE 3A)**

**Campus** St Albans, Werribee  
**Prerequisite(s)** SBM1520 or SBM1528 or equivalent

**Content** This subject aims to provide students with an understanding of the control and co-ordination of body systems and the effects of disturbances to body functions. The mental status and some psychosocial factors associated with these processes will be discussed. Students are introduced to major
pathologic processes which may affect all parts of the body. Topics include tissue injury, inflammation and repair, normal immune function and deviations from normal, cancer from the molecular level to the whole person, neural and endocrine dysfunction including impaired cognition such as dementia and impaired co-ordination and control. In the laboratory, students will be introduced to basic laboratory techniques and apply scientific principles to the assessment of dysfunction in humans. Students are also introduced to the research literature, research techniques and the communication of scientific information by a series of presentations. There may be some interchange of topic material relating to specific body systems between SBM2530 and SBM2540 and the specific diseases chosen to illustrate major processes may vary as appropriate.


**Class Contact** Seven hours per week comprising three hours of lectures, three hours of laboratory and one one-hour tutorial for one semester.

**Assessment**
- Test and examinations, 65%; practical and tutorial work, 35%. Students are required to obtain a satisfactory grade in all components of the assessment to obtain a pass grade.
- **SBM2540 PATHOPHYSIOLOGY 2 (HUMAN BIOSCIENCE 4A)**
  - **Campus** St Albans, Werribee
  - **Prerequisite(s)** SBM2530 Human Bioscience 3A or equivalent
  - **Content** This subject primarily examines the effects of dysfunction in particular human body systems, drawing on the knowledge of basic pathological processes and overall regulation of the human body discussed in SBM2530. Overall organ and system dysfunction such as hepatic, renal, cardiovascular and respiratory failure will be discussed. Major disease types and processes such as circulatory shock, obstructive airways disorders, atherosclerosis, disorders of acid-base balance and sexually transmitted diseases will be examined and the psychosocial effects of such disorders will be included. Specific diseases will be chosen to illustrate the major concepts as appropriate. Sexuality will be discussed with respect to its physiological and psychosocial aspects. Students are introduced to further techniques for assessment of disorders, which may include the role and practice of molecular biology. There may be some interchange of topic material relating to specific body systems between SBM2530 and SBM2540 and the specific diseases chosen to illustrate major processes may vary as appropriate.

**SBM2540 MEDICAL BIOCHEMISTRY**
- **Campus** St Albans
- **Prerequisite(s)** SBI1310 Biology 1, SCS1100 Chemistry for Biomedical Sciences.
- **Content** The aim of this subject is provide a foundation in biochemical principles with special emphasis on medical conditions and applications. Firstly, foundations of biochemistry will be covered, e.g. biological buffers, structures of amino acids, nucleotides, carbohydrates, lipids, protein and nucleic acids, vitamins and cofactors. The major biochemical pathways will be covered such as glycolysis, TCA cycle, oxidative phosphorylation, gluconeogenesis, lipid, amino acid and nucleotide metabolism. The biochemistry of diseases such as cystic fibrosis, phenylketonuria (PKU), myasthenia gravis, thalassemia, anorexia nervosa and heart disease will be examined. Other topics covered will be DNA replication, RNA transcription, gene regulation, genetic diseases and their diagnosis neurotransmitter metabolism, action and detoxification of drugs/toxins and hormonal regulation. Clinically measured enzymes for diseases will be studied and assayed.
- **Class Contact** Six hours per week, comprising three hours of lectures and three hours of practicals/tutorials for one semester.
- **Assessment** Tutorials and assignments, 25%; practical work (including tests), 25%; final examination 50%.

**SBM2570 PHYTOPHARMACEUTICS**
- **Campus** St Albans
- **Prerequisite(s)** SBM1529 Introduction to Plant Sciences; SBM1525 Anatomy and Physiology 2
- **Content** Basic phytochemistry and Phythopharmacology; Pharmacological Activities – Chinese natural drugs acting on the various body systems; Active Constituents of the Chinese pharmacy; Toxic dosages – LD 50 concept; toxic dosages of the Scheduled Poisons List – Chinese herbs; poisoning records and Chinese Medical antidotes.
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introduction to the evolution of humans and the evolution of society with particular reference to health and disease. There are prerequisite(s) SBM2580 ADVANCED FUNCTIONAL ANATOMY

Content The relevance of functional and clinical anatomy to health and healing will be highlighted through a detailed study of the mechanics and muscles affecting the movement of joints in the body. This information will be presented and highlighted through the study of a number of different areas including kinesiology, biomechanics, gait analysis, posture, massage, muscle testing, exercise, stretching, basic soft tissue techniques, and awareness through movement and posture. There will be a particular emphasis on muscle testing and surface anatomy. Topics included in the subject may be interchanged with those of the subject SBM 1514 Functional Anatomy 1 and SBM 1524 Functional Anatomy 2


Class Contact Six hours per week for one semester comprising three one-hour lectures and one three-hour tutorial/practical session

Assessment Theory examination 55%, practical examination 20%, written assignment 25%

SBM2590 FUNCTIONAL HISTOLOGY

Campus St Albans

Prerequisite(s) SBM1524 Functional Anatomy or SBM1528 Human Physiology or equivalent Content This subject aims to introduce students to light and electron microscopic study of the structure of cells and tissues. Students will develop skills in the identification of histological sections and electron micrographs. The subject provides necessary background for more advanced study in the area of molecular cell biology, in particular, the use of immunohistological and in situ hybridization techniques. After a brief revision of basic cell types, the histological appearance and associated functions of the following systems are studied: cardiovascular, respiratory, immune, gastrointestinal, urinary, reproductive, endocrine, nervous and musculoskeletal. The relevance of functional histology to health will be highlighted.


Class Contact Three hours per week for one semester, 1-3h lectures, 1-3h practicals

Assessment Theory examination 50%, practical examination 50%

SBM2610 BIOMEDICAL SCIENCES AND SOCIETY

Campus St Albans

Prerequisite(s) Nil

Content The subject examines images of the human body in society with particular reference to health and disease. There are three themes within this subject. The first theme provides a brief introduction to the evolution of humans and the evolution of consciousness, drawing upon Darwinian theory. Questions such as what it means to be human, what consciousness is and whether there is a biological role for men and women may be discussed. The second theme is the current image of the human body in society with respect to what is considered healthy. Topics which may be discussed here may include how disorders of body-image such as anorexia arise, and how parts or diseases of the human body are used as metaphors for society, for example, the heart, the limbs, the head, and cancer. The third theme examines how biomedical science defines health and disease, sanity and mental illness and influences our concepts of the human body.


Class Contact Four hours per week comprising two one hour lectures and one two hour tutorial/seminar session for one semester.

Assessment Two essays, 60%; one tutorial presentation, 25%; tutorial attendance and participation, 15%.

SBM2750 NUTRITION

Campus Werribee

Prerequisite(s) SBF1310 Biology 2 or equivalent. Students would be expected to have studied or undertake concurrent study in SBF2520 Biochemistry 1.

Content The subject aims to provide an introduction to the principles of human nutrition as a background for further studies in Food Technology (units SBF3731 and SBF3732), to enable students to appreciate the nutritional consequences and responsibilities associated with the provision, processing and development of food and food products. This subject examines: body composition and anthropometry; nutrient requirements and role in body structure and function; energy intake and expenditure; food and nutrient supply; nutritional requirements under different environmental and physiological states; diet and health; dietary guidelines; dietary requirements and special dietary foods.


Class Contact Four hours per week for one semester comprising three hours of lectures and one hour of tutorials.

Assessment Assignments, 30%; final examination, 70%.

SBM2800 CARDIORESPIRATORY AND RENAL PHYSIOLOGY

Campus Footscray Park

Prerequisite(s) SBM1518 Human Physiology 1 and SBM1528 Human Physiology 2.

Content This subject aims to provide students with an understanding of the function, control and co-ordination of the cardiovascular, respiratory and renal systems. The subject will examine cardiac, pulmonary and renal function and normal
circulatory, respiratory and renal dynamics. An overview of the co-ordination of these systems will be achieved through an examination of the mechanisms involved in maintaining fluid and electrolyte balance including the role of membrane structures and capillary dynamics, and the integration of neural, endocrine function in the control of cardiovascular, respiratory and renal systems. Homeostatic control of the cardiac, pulmonary and renal systems will also be examined by investigating their responses to stresses, including exercise, high altitude, increased temperature, spaceflight and aging.


**Class Contact** Six hours per week for one semester comprising three hours of lectures and three hours of practical and/or tutorial per week.

**Assessment** Semester examination, 60%; practical reports, 20%; assignment, 20%.

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**SBM2010 PHARMACOLOGY**

**Campus** Footscray Park, St Albans.

**Prerequisite(s)** SCSS100 Chemistry for Biological Sciences, SBM2560 Medical Biochemistry, SBM1518 and SBM1528 Human Physiology 1 and 2, or equivalent units.

**Content** The unit examines the pharmacodynamic processes of drug action, molecular pharmacology and specific drug therapies. Aspects relating to both medicinal chemistry, toxicity testing, clinical trials and requirements for the admission of new drugs are covered in topics that relate to new drug development. Pharmacokinetics, pharmacogenetics, sensitivity and resistance to drug therapies are further topics that address variation in drug outcomes. Social drug abuse and types of drug dependence are also discussed in this unit.


**Class Contact** Six hours per week over one semester based on two hours of lecture, one hour of tutorial and three hours of practical sessions.

**Assessment** Assignment 15%; practical reports 20%; end of semester examination 65%.

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**SBM3171 ENDOCRINOLOGY AND REPRODUCTION**

**Campus** Footscray Park, St Albans.

**Prerequisite(s)** SBM1528 Human Physiology 2 or equivalent units.

**Content** This subject examines the mechanisms by which hormones exert their effects on metabolism, renal function, reproductive function and growth. This subject encompasses the basic principles involved in understanding the mechanisms of hormone action and specifically concentrates on the following areas. Mechanisms of hormone action: peptide hormones and steroids; hormonal control of metabolism; the importance of renal function in maintaining homeostasis; reproductive endocrinology; growth and development; hormonal and metabolic control of growth.


**Class Contact** Two hours per week for one semester comprising 20 hours of lectures and 6 hours of practical work.

**Assessment** Based on assignments, practical reports and an end-of-semester examination.

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**SBM3264 ADVANCED NERVE AND MUSCLE**

**PHYSIOLOGY**

**Campus** Footscray Park

**Prerequisite(s)** SBM2800 Cardiorespiratory and Renal Physiology or equivalent.

**Content** The aim of the subject is to examine in detail the mechanisms of nerve and muscle function. Topics include: physico-chemical principles underlying nerve and muscle function; behaviour of excitable cells; mechanisms of muscle contraction; neural influences over muscles and muscle fibre types; muscle fibre recruitment; metabolic processes in active muscle; neuromuscular fatigue; co-ordinating motor activity, and diseases of the nervous and muscular systems. Research techniques in nerve and muscle physiology.


**Class Contact** Three hours of lectures, one one-hour tutorial and two hours of practical work each week for one semester.

**Assessment** Based on laboratory reports, tutorial assignments and an end-of-semester examination.

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**SBM3515 CLINICAL PHARMACOLOGY AND PATHOPHYSIOLOGY**

**Campus** St Albans

**Prerequisite(s)** SBM2570 Phytopharmaceutics

**Content** Fundamental pathophysiology, commonly used pharmaceuticals, and pertinent medical terminology with particular emphasis on understanding the actions of specific pharmaceuticals and the identification of potentially life-threatening conditions.


**Class Contact** The equivalent of six hours per week for one semester consisting of lectures, tutorials and clinical observation in appropriate health care settings.

**Assessment** One assignment, 25%; one examination, 50%; and one clinical report, 25%.

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**SBM3550 ADVANCED BIOSCIENCE 5A**

**Campus** St Albans, Werribee.

**Prerequisite(s)** SBM2540 Human Bioscience 4A.

**Content** This subject builds on the work of first and second year Human Bioscience. The overall concept to be studied is the process of human development and aging and the physiological and pathological changes that occur throughout the life cycle. This subject presents the major regulating systems of the body and thus involves advanced study in the areas of neurological, hormonal and reproductive changes. Life stages from the embryo to senescence will be studied and environmental and cultural influences will also be discussed. The subject allows exposure to a range of scientific techniques through the laboratory component and may include a minor project.

**Required Reading** To be advised by lecturer.
Class Contact Eight hours per week comprising three hours of lectures and five hours of laboratory for one semester.

Assessment Test, examination and project, 70%; practical work and tutorials, 30%. Students are required to obtain a satisfactory grade in all components of the assessment to obtain a pass grade.

SBM3554 CLINICAL PATHOPHYSIOLOGY

Campus St Albans

Prerequisite(s) SBM3515 Clinical Pharmacology and Pathophysiology

Content Development of material covered in ‘Clinical Pharmacology and Pathophysiology’ with particular emphasis on the identification of potentially life-threatening conditions. An understanding of the main pathology tests and diagnostic techniques; the development of skill in the use of the stethoscope, sphygmomanometer, otoscope, organ palpation and other basic procedures employed by the health care professionals; a CM understanding of the biomedical conditions studied.


Class Contact The equivalent of four hours per week for one semester consisting of lectures, tutorials and clinical observation in appropriate health care settings.

Assessment One assignment, 25%; one examination, 50%; and one practical assessment on the use of diagnostic equipment, 25%.

SBM3560 ADVANCED BIOSCIENCE 5A

Campus St Albans, Werribee.

Prerequisite(s) SBM3550 Advanced Bioscience 5A.

Content This subject continues on the theme of development and ageing and the physiological processes that occur, building on SBM3550 Advanced Bioscience 5A. This subject investigates specific areas of human physiology such as immunology, genetics, neoplasia and systems of the body. This includes the exploration of changes that occur throughout the life cycle and interaction with the environment. The subject allows exposure to a range of scientific techniques through the laboratory component and may include a minor project.

Required Reading To be advised by lecturer.

Class Contact Eight hours per week comprising three hours of lectures and five hours of laboratory work for one semester.

Assessment Test, examination and project, 70%; practical work and tutorials, 30%. Students are required to obtain a satisfactory grade in all components of the assessment to obtain a pass grade.

SBM3564 CLINICAL PHARMACOLOGY

Campus St Albans

Prerequisite(s) SBM2722 Human Biomedicine 4 and SBM2560 Botanical Pharmacaceutics or equivalent.

Corequisite SBM3554 Clinical Pathophysiology

Content An introduction to the mechanisms of drug action with particular reference to drugs prescribed in the hospital situation. From the subject it is expected that students will be able to identify the selective therapeutic and prophylactic effects of drugs. This is covered by describing the theory of drugs at a molecular level. With these constructs the students should be able to relate the advantages of a particular drug therapy, as well as its unwarranted side effects and drug-drug interactions. This unit is designed to run in conjunction with SBM3554 Clinical Pathophysiology.


Recommended Reading Society of Hospital Pharmacists of Australia, 1995, Pharmacology and Drug Information for Nurses, 4th edn, W.B. Saunders/Balliere Tindall.

Class Contact The equivalence of two hours per week for two semesters.

Assessment Two Assignments, 25% each; end of semester 1 examination 25%, end of semester 2 examination 25%.

SBM3570 TOXICOLOGY 2

Campus Footscray Park

Prerequisite(s) SC5371 Toxicology 1 or equivalent unit

Content The unit covers the possible adverse effects from exposure to hazardous chemicals in work environments. Topics include biotransformation and pharmacokinetics; biological monitoring and health surveillance; air pollutants and respiratory tract irritants; the deposition of particulates and fibres along in the ventilatory system; ecotoxicology; effects of various substances used in industry that have documented effects on the nervous, reproductive, cardiovascular, renal and hepatic system, genotoxins, mutagens and carcinogens. Food toxins, ionising radiation and electromagnetic field effects are also discussed.


Class Contact Two hours per week for two semesters.

Assessment Reports (60%) and assignment (40%)

SBM3590 ADVANCED HISTOLOGICAL TECHNIQUES

Campus St Albans

Prerequisite(s) All year 2 core units (SBM2800, SBM2260, SBM2530, SBM2540), SBM2590 Functional Histology and SBM2560 Medical Biochemistry.

Content This subject introduces students to a variety of histological techniques and the role they play in medical research. There will be a particular emphasis on students receiving practical skills in a histology laboratory setting. Students will obtain skills in tissue sampling, preparation of fixed and frozen sections for light and electron microscopy, basic tissue staining, immunohistochemistry and in situ hybridization. Students will be introduced to light microscopy, confocal microscopy, transmission and scanning electron microscopy, morphology and morphometry.


Class Contact Six hours per week for one semester comprising 3 hours of lectures and 3 hours of practicals

Assessment Theory examination 55%, practical examination/assignment 45%
SBM3610 BIOMEDICAL SCIENCE, ETHICS AND VALUES
Campus St Albans
Prerequisite(s) Successful completion of appropriate subject(s) in human biology or psychology at tertiary level.
Content This subject discusses, with examples, how scientists have investigated the functioning of the human body in health and disease: in-vitro experiments, forced or voluntary participation in experimentation, the use of animal models etc. The ethics of these practices are examined – how do we justify or choose the practices which elucidate the function of the human body? Who regulates the conduct of research? Can research into humans be objective and is objectivity a gendered concept? Issues arising from the practice of biomedical sciences will be examined, such as in-vitro fertilisation, the human genome project, genetic screening, competition and fraud, and toxicity testing. The selected topics may vary as appropriate.
Class Contact Four hours per week comprising two one hour lectures and one two hour tutorial/seminar session for one semester.
Assessment Two essays, 60%; one tutorial presentation, 25%; tutorial attendance and participation, 15%.

SBM3620 CHALLENGING THE SCIENTIFIC PARADIGM
Campus St Albans
Prerequisite(s) SBF2922 Science and Society or an appropriate unit from the health sciences or complementary therapies.
Content This subject examines how biomedical science in the twentieth century is under question. Alternative theories of the functioning of the human body will be explored – for example, from the complementary theories and from non-Western cultures. Critiques of complementary therapies from a biomedical sciences viewpoint and critiques of biomedical science from a complementary therapies viewpoint will be examined to address questions such as whether the two perspectives overlap and whether there can be an assimilation of biomedical science with aspects of complementary therapies. Environmental philosophy will be drawn upon to examine how humans perceive themselves in relation to the environment in general and other species in particular. Some human-centred versus eco-centric views will be explored.
Required Reading To be advised by lecturer.

Class Contact Four hours per week comprising two one-hour lectures and one two-hour tutorial/seminar session for one semester.
Assessment Two essays, 60%; one tutorial presentation, 25%; tutorial attendance and participation, 15%.

SBM3630 SCIENCE, MEDIA AND COMMUNICATION
Campus St Albans
Prerequisite(s) ACC1042 Communications A; ACC1043 Communications B or equivalent.
Content In this subject, students will be introduced to the forms by which information about biomedical sciences and health is communicated via the media. A critical understanding will be developed of the ways in which media information is used to persuade individuals about the value or otherwise of biomedical information to market products and influence behaviour will be examined with particular attention paid to the marketing of pharmaceutical products, medical practice, health education programs and complementary therapies. Students will examine materials such as newspapers, popular magazines concerned with health, health education material and examples of the scientific reports of public institutions concerned with the biomedical sciences.
Required Reading To be advised by lecturer.
Class Contact Four hours per week comprising two one-hour lectures and one two-hour seminar session for one semester.
Assessment Assignment, 40%; class presentation, 20%; media scrapbook and critical journal, 40%.

SBM3640 ADVANCED NEUROSCIENCES
Campus St Albans
Prerequisite(s) SBM2530 Pathophysiology (Bioscience 4A)
Content This subject aims to provide insights into the most important current ideas in the study of neuroanatomy, neurophysiology and developmental neurobiology. This subject provides an advanced series of lectures in specialised areas of neuroscience research. The content of the subject may vary with the expertise and research interests of the lecturing staff.
Required Reading Various scientific journals
Class Contact Three hours of lectures per week for one semester
Assessment Theory examination 55%, practical examination/assignment 45%

SBM3650 ADVANCED REPRODUCTION AND DEVELOPMENT
Campus St Albans
Prerequisite(s) SBM2530 Pathophysiology (Bioscience 4A)
Content This subject provides an advanced series of lectures examining current research questions in the area of reproduction and development. Topics include: maternal recognition of pregnancy via foetal signalling and the resultant maternal response during the period of implantation; development of the embryonic neural crest, including epithelial-mesenchymal transformation, migration, and contribution to mature differentiated cell types; the role of steroid hormones in placental function; the role of autoocrine and paracrine growth factors in the development of the foetal lung; the role of various extracellular matrix cytokines in the breakdown of the foetal membranes at birth. The content of this subject may vary with the expertise and research interests of the lecturing staff.
Required Reading Various scientific journals
SBM3660 HUMAN DEVELOPMENTAL AND CLINICAL GENETICS

Campus St Albans

Prerequisite(s) SBM 2560 Medical Biochemistry or equivalent, SBF 2330 Cell biology

Content The subject is designed to introduce students to developmental and clinical genetics with a specifically human focus. The major emphasis is on the importance of gene expression in normal development and variation, and the contribution of genetic abnormalities to disease.

Topics may include: The role of genes in development; differentiation and congenital malformation; human genetic principles such as assortment and segregation of genes, genetic variation and genetic defects, the importance of genetic heterogeneity, mendelian inheritance and gene frequencies in populations; diagnostic and classification of genetic disorders; prenatal screening and diagnosis; disorders with genetic and environmental associations.

Required Reading Research and review articles as appropriate

Assessment Three hours of lectures and three hours practical work for 1 semester

Class Contact Three hours of lectures and three hours practical work per week for one semester

Assessment Theory examination 55%, practical examination/assignment 45%

SBM3670 MOLECULAR PSYCHOLOGY

Campus St Albans

Prerequisite(s) SBM 1234 Advanced Bioscience 5A or equivalent

Content This subject explores the relationships between Molecular Biology, Psychology, Anatomy and Genetics and Human Behaviour and Emotions. These relationships will be discussed in light of current research findings and current literature. The lecture series will explore the current zeitgeist of the medical and scientific community with respect to Molecular psychology. e.g: Topics may include explanation of brain anatomy and psychology and anti-social behaviour patterns, e.g: violent criminal behaviour.

Required Reading Research and review articles as appropriate

Assessment Three hours of lectures 1 semester

Class Contact Three hours of lectures and three hours practical work per week for one semester

Assessment Theory examination 50%, assignments 50%

SBM3720 IMMUNOLOGY

Campus Werribee

Prerequisite(s) SBF2300 Microbiology 1 or SBM2530 Pathophysiology 2

Content The aims of this subject is to provide students with an understanding of theoretical and practical bases of immunology. Subject topics include: active and passive immunity, components of the immune system, the immune response, immunological techniques and their application, molecular diagnostics including the use of monoclonal antibodies. The subject will be explored as a basic science with applications in the agriculture industry, food science, environmental science and medical science.

Required Reading Roitt, I.M., Brostoff, J. and Male, D.K. 1993, Immunology, 3rd edn, Mosby, St Louis.

Class Contact Eight hours per week comprising three hours of lectures and five hours of laboratory/tutorial work for one semester.

Assessment Assignments, 20%; practical work, 30%; final examination, 50%.

SBM3810 WELLNESS 1

Campus St Albans

Prerequisite(s) SBM2530 and SBM2540 or equivalent, or SBM2800 Cardiorespiratory and Renal Physiology plus other relevant second year units at the discretion of the co-ordinator.

Content Module A: This unit introduces the concepts of mind, body and spirit. These areas are explored from psychological, physiological, philosophical and sociological perspectives. Current literature will be used to introduce the areas of psychophysiology and psychoneuroimmunology and their connections to the mind/body/spirit paradigm. The ethics of human research and evaluation will be discussed throughout the series of lectures. In addition, students will be introduced to basic methods of information gathering with respect to the mind-body-spirit paradigm including the evaluation of its status in individuals.

Module B: Students will be introduced to fundamental concepts of health and wellness. The difference between professional/scientific concepts and lay concepts will be explored. Wellness promotion will be presented primarily in the context of established public health approaches utilised in health education, promotion and prevention including medical, behavioural, educational, social and empowerment strategies. Some of the dilemmas and pitfalls in health promotion will be canvassed. Students will also be introduced to base concepts of occupational health and safety and workplace health promotion. Risk assessment, material safety, manual handling and relevant legislation will be discussed. Context will be provided by guest speakers from relevant organisations.


Class Contact Module A: Three hours per week for one semester, comprising two hours of lectures and one hour of tutorial. Module B: Three hours per week for one semester comprising one and a half hours of lectures and one and a half hours tutorial/seminar.

Assessment Assignment/tutorial work, 25%; examination, 25% for each of Module A and B.

Class Contact Eight hours per week comprising three hours of lectures and five hours of laboratory/tutorial work for one semester.

Assessment Assignments, 20%; practical work, 30%; final examination, 50%.

SBM3820 WELLNESS 2

Campus St Albans

Prerequisite(s) SBM3810 Wellness 1.

Content Module A: The subject extends the material covered with respect to Mind, Body and Spirit, exploring in greater depth, aspects of psychophysiology and psychoneuroimmunology such as stress and disease, sexuality and the impact of environment on the health of the mind, body and spirit. Techniques used to investigate and address these areas of health and lifestyle will be introduced, for example, needs assessment, relaxation, stress management. Current research literature in the area will be analysed. Module B: Students will be introduced to the systematic
planning of health and wellness education and promotion. Examples and discussion will be provided in the context of relevant issues, for example, community participation, the role of professionals, young people and STD's/AIDS, alcohol use, and the role of the media in health. Guest speakers from health-promoting organisations will be provided to explore health education and promotion issues. Examples include the local government planning process/healthy cities approach, Alzheimer's Disease, Eating disorders and the Quit campaign. Other relevant speakers/issues may be discussed as appropriate. An individual health promotion project within the unit requires students to assess their own health/wellness needs, then design, implement and evaluate an appropriate program for themselves over the semester. Students are further strongly encouraged to take the third year project in conjunction with this unit, and to apply their skills to the development of the project as a health promotion and education exercise oriented to the workplace or conducted within an organisation that promotes health.


**Class Contact** Module A: Three hours per week for one semester, comprising two hours of lectures and one hour of tutorial. Module B: Three hours per week for one semester comprising one and a half hours of lectures and one and a half hours tutorial/seminar.

**Assessment** Assignment/tutorial work, 25%; examination, 25% for each of Module A and B.

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**SBM3910 PROJECT**

**Campus** Footscray Park, St Albans, Werribee

**Prerequisite(s)** Successful completion of the second year of the Biomedical Sciences degree

**Content** Third year student projects provide students with an opportunity to select and undertake either (a) a brief research project in an area of interest with members of the Biomedical Sciences staff; or (b) a work-based placement in the industry he/she intends to enter. Both the research and work-based placements enable the student to undertake a structured work experience program as an integral part of their degree course. Gaining practical experience in their chosen field enables students to test interest and ability in these areas.

**Required Reading** Selected material as advised by the project supervisor

**Class Contact** Six hours per week for one semester comprising laboratory work or work-based placement

**Assessment** 20% project proposal; 80% final report

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**SBM4000 SCIENCE HONOURS**

**Campus** St Albans, Werribee, Footscray Park.

**Prerequisite(s)** Satisfactory completion of an undergraduate degree program with a credit average in the final year.

**Content** The Honours program consists of SBM4100 Honours Research Project, SBM4200 Honours Coursework and, if appropriate, a Research Design subject (HPG6010 or equivalent). The research project will be undertaken in one of the research areas of the School of Life Sciences and Technology and may, subject to approval, be undertaken at an external location. The Coursework and Research Design components cover a range of information including advanced areas of medical research, literature analysis and critical appraisal, ethics in research, scientific writing, oral presentation, methodological techniques, experimental design, statistics, data analysis, computer applications and software data presentation.

**Required Reading** To be advised by the supervisor.

**Class Contact** An average of 20 hours per week for two semesters.

**Assessment** The nature of the coursework assessment will vary and may be based on written assignments, seminar presentations and a written examination. The research project assessment will consist of an oral presentation and submission of a thesis.

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**SBM4100 HONOURS RESEARCH PROJECT**

**Campus** Footscray Park, St Albans, Werribee.

**Prerequisite(s)** Satisfactory completion of an undergraduate degree program with a credit average in the final year; or at the discretion of the Course Co-ordinator.

**Content** The aim of the project is to enable students to conduct a research project under supervision. The project will comprise a scientific investigation in an area of expertise of the project supervisor. The results of the project will be reported in an oral presentation and a written thesis, which will include an introduction, a description of methodology, results, a discussion of the results (including a critical appraisal of the results) and recommendations for further research in the area.

**Required Reading** To be advised by the supervisor.

**Class Contact** No formal contact hours, although a normal full-time load is considered 20 hours per week. Regular meetings with the supervisor are recommended.

**Assessment** The research project will be assessed on the basis of the literature review, the oral presentation and the quality of the research and its presentation in the thesis.

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**SBM4200 HONOURS COURSEWORK**

**Campus** Footscray Park, St Albans, Werribee.

**Prerequisite(s)** Satisfactory completion of an undergraduate degree program with a credit average in the final year; or at the discretion of the Course Co-ordinator.

**Content** There are two times of coursework associated with this enrolment code which will be chosen from a list provided by the Honours Co-ordinator. The form of each item will vary and may consist of formal lecture series, laboratory based practical program or prescribed reading. The deadline for the completion of the coursework will normally be the beginning of semester 2.

**Required Reading** To be advised by the relevant member of staff offering the unit.

**Class Contact** Coursework units will comprise 10 hours of lectures or the equivalent in prescribed reading.

**Assessment** The nature of the assessment will vary and may consist of a formal examination or written assignments.

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**SCA1100 INTRODUCTORY AERONAUTICS**

**Campus** Footscray Park, Flying Training at Moorabbin.

**Prerequisite(s)** SPH1601 Physics 1SA; SCM1711 Mathematical Foundations 1.

**Co-requisite(s)** SPH1602 Physics 1SB; SCM1712 Mathematical Foundations 2.
Content  Aeronautical concepts required to satisfy the theory requirements of the Civil Aviation Safety Authority (CASA) necessary before a student may be permitted to fly an aircraft solo.

Required Reading  To be advised by lecturer.

Class Contact  2 x 1 hour lectures per week for one semester.

Assessment  Internal examination as determined by subject leader.

SCA2000 PRACTICAL FLYING 1 (GFPT)

Location  Moorabbin

Prerequisite(s)  SCA1100 Introductory Aeronautics.

Content  Flying practice exercises and procedures necessary for a student to be permitted to undertake the General Flying Proficiency Test (GFPT) as required by the Civil Aviation Safety Authority (CASA) prior to students receiving practical navigational training.

Required Reading  To be advised by lecturer.

Class Contact  An average of two hours per week for one semester.

Assessment  Practical demonstration of flight skills as required by the subject leader to the level set by the Civil Aviation Authority.

SCA2100 RADIO TELEPHONY AND FLIGHT RULES

Campus  Footscray Park

Prerequisite(s)  SCA1100 Introductory Aeronautics.

Content  Principles and procedures surrounding operation of airborne communication and navigation equipment, and procedures followed in flight rules and the legislative rules governing aircraft operation.

Required Reading  To be advised by lecturer.

Class Contact  1 x one hour lecture per week for one semester.

Assessment  Internal examination determined by subject leader.

SCA2101 BASIC AERONAUTICS (AREA SOLO/BAK)

Campus  Footscray Park

Prerequisite(s)  SCA1100 Introductory Aeronautics.

Content  Aeronautical concepts required to satisfy the theory requirements of the Civil Aviation Authority necessary before a student may be permitted to attempt the General Flying Proficiency Test (GFPT).

Required Reading  To be advised.

Class Contact  2 x 1 hour lectures per week for one semester.

Assessment  Internal examination determined by lecturer in charge.

SCA2102 AIRCRAFT GENERAL KNOWLEDGE

Campus  Footscray Park

Prerequisite(s)  SCA1100 Introductory Aeronautics.

Content  Aspects of aircraft operations, limitations, and other performance characteristics required to meet the Civil Aviation Authority theory syllabus requirements for those aspects of the Private Pilot's Licence.

Required Reading  To be advised by lecturer.

Class Contact  3 x 1 hour lectures per week for one semester.

Assessment  Internal examination as determined by subject lecturer.

SCA2103 BASIC NAVIGATION

Campus  Footscray Park

Prerequisite(s)  SCA1100 Introductory Aeronautics.

Content  Introduction to the principles and practice of aerial navigation, meteorology and other aspects of cross country flight sufficient to meet the Civil Aviation Authority theory syllabus requirements for those aspects of the Private Pilot's Licence.

Required Reading  To be advised by lecturer.

Class Contact  2 x 1 hour lectures per week for one semester.

Assessment  Internal examination as determined by subject leader.

SCA2104 INTERMEDIATE AERONAUTICAL KNOWLEDGE

Campus  Footscray Park


Co-requisite(s)  SCA2103 Basic Navigation.

Content  Advanced flight principles, procedures, including navigation, aircraft operation and performance, meteorology and air legislation required to satisfy the theory requirements of the Civil Aviation Authority for the issue of a Commercial Pilot's Licence (CPL).

Required Reading  To be advised by lecturer.

Class Contact  6 x 2 hour lectures per week for one semester.

Assessment  Two three hour external examinations, held on the same day, as determined by the Civil Aviation Authority. Simultaneous passes are required for a pass in the subject.

SCA3000 PRACTICAL FLYING 2 (PPL)

Campus  Moorabbin

Prerequisite(s)  SCA2104 Intermediate Aeronautical Knowledge.

Content  An integrated program of practical flight instruction in preparation for Practical Flying 3, that would normally lead to the student demonstrating sufficient skill and knowledge to attain the Private Pilot's Licence (PPL).

Required Reading  To be advised by lecturer.

Class Contact  An average of 3 hours per week for one semester, delivered in suitable blocks as assessed by the subject leader.

Assessment  Practical demonstration of flight skills as required by the subject leader to the level set by the Civil Aviation Authority.

SCA3001 PRACTICAL FLYING 3

Campus  Moorabbin.

Prerequisite(s)  SCA3000 Practical Flying 2; SCA2104 Intermediate Aeronautical Knowledge.

Content  Practical aspects of flying and navigation sufficient to meet the standard of the Civil Aviation Safety Authority for the Issue of a Commercial Pilot's Licence (CPL) and Instrument Rating (IREX).

Required Reading  To be advised by lecturer.

Class Contact  An average of 8 hours per week for one semester, delivered in suitable blocks as assessed by the subject lecturer.
Assessment Practical demonstration of flight skills as required by the subject leader to the level set by the Civil Aviation Safety Authority.

SCA3100 INSTRUMENT NAVIGATION (IREX)
Campus Footscray Park
Prerequisite(s) SCA2104 Intermediate Aeronautical Knowledge.
Content Theory aspects of the use of the different navigation instruments available to a pilot, and their operation under instrument flight rules (IFR) sufficient to meet the theory requirements of the Civil Aviation Authority for the issue of a command instrument rating.
Required Reading To be advised by lecturer.
Class Contact 1 x 1 hour workshop per week for one semester.
Assessment One three-hour external examination.

SCA3101 ADVANCED AERONAUTICS 1
Campus Footscray Park
Prerequisite(s) SCA2104 Intermediate Aeronautical Knowledge.
Content Advanced aviation concepts sufficient to meet the theory requirements of the Civil Aviation Safety Authority Airline Public Transport licence examinations in: Performance and loading – Aeroplane; Aerodynamics and Aircraft Systems – Aeroplane; Air Law – Aeroplane.
Required Reading To be advised by lecturer.
Class Contact 1 x 3 hour lecture and 1 x 3 hour workshop per week for one semester.
Assessment Two examinations of two hours and thirty minutes and one examination of one hour and thirty minutes as determined by the Civil Aviation Safety Authority.

SCA3103 ADVANCED AERONAUTICS 2
Campus Footscray Park
Prerequisite(s) SCA2104 Intermediate Aeronautical Knowledge; SCA3101 Advanced Aeronautics 1.
Content Advanced aviation concepts sufficient to meet the theory requirements of the Civil Aviation Safety Authority Airline Public Transport licence examinations in: Flight Planning – Aeroplane; Navigation – Aeroplane; Meteorology – Aeroplane.
Required Reading To be advised by lecturer.
Class Contact 1 x 3 hour lecture and 1 x 3 hour workshop per week for one semester.
Assessment One three hour examination and two one and a half hour examinations as determined by the Civil Aviation Safety Authority.

SCA3104 HUMAN FACTORS
Campus Footscray Park
Prerequisite(s) SCA2104 Intermediate Aeronautical Knowledge.
Content Instruction in the limitations of human performance in regard to the operation of aircraft as required by the Civil Aviation Safety Authority (CASA).
Required Reading To be advised by lecturer.
Class Contact 1 x 1 hour workshop per week for one semester.
Assessment External examination as determined by the Civil Aviation Safety Authority.

SCM1111 INTRODUCTION TO COMPUTER SYSTEMS 1
Campus Footscray Park
Prerequisite(s) Nil
Co-requisite(s) Nil
Required Reading Nil
Recommended Reading Brooksheer, J.G., 2000, Computer Science: An Overview, 6th edn, Addison-Wesley.
Class Contact Three hours per week for one semester, comprising one hour lecture and two hour laboratory/tutorial.
Assessment Final examination 60%; assignment and tests 40%.

SCM1112 INTRODUCTION TO COMPUTER SYSTEMS 2
Campus Footscray Park, Hong Kong
Prerequisite(s) Nil.
Content Web site design, including usability, page layout, site organisation and navigation, standard. HTML, CSS, Javascript, image formats, ethical and legal issues.
Required Reading To be advised by lecturer.
Recommended Reading To be advised by the lecturer.
Class Contact Three hours per week for one semester, comprising one one-hour lecture and two one-hour laboratory/tutorials.
Assessment Final examination, 70%; assignment and tests, 30%.

SCM1113 COMPUTER ORGANISATION AND ARCHITECTURE
Campus Footscray Park, Hong Kong
Prerequisite(s) Nil.
Content Key milestones, concepts, and historical developments of computer systems. Computer peripherals and storage devices: Display units, printers, scanners, Magnetic storage devices, Optical storage devices, RAID, Multimedia and natural I/O.  Representation of Information in Computer Systems: Representing symbolic information, Representing multimedia data, Representing integers, Representing fractions and real numbers, Equivalence of number systems, Operations on numbers. System Architecture: Measures of performance efficiency, Chip manufacturing, logic gates, Memory hierarchy, Central processing unit and registers, Instruction execution processes and data structures, Machine instructions design, Assembly level programming, RISC vs CISC, Superscalar and superpipeline. Novel and emerging architectures: VLIW, Prediction and branch prediction, Parallel architectures.
Required Reading Nil.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>SCM1311</td>
<td>PROGRAMMING 1</td>
<td>Footeesray Park, Hong Kong</td>
<td>Nil</td>
<td>Required Reading To be advised by lecturer.</td>
<td>Lewis, J. and Loftus, W., 2001, <em>Java Software Solutions</em>, 2nd edn update, Addison-Wesley.</td>
<td>Four hours per week for one semester, comprising two hours of lectures and two hours of laboratory/tutorial.</td>
<td>Final examination, 70% assignment and tests, 30%.</td>
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<tr>
<td>SCM1312</td>
<td>PROGRAMMING 2</td>
<td>Footeesray Park, Hong Kong</td>
<td>Nil</td>
<td>Required Reading To be advised by lecturer.</td>
<td>Lewis, J. and Loftus, W., 2000, <em>Java Software Solutions</em>, 2nd edn, Addison-Wesley.</td>
<td>Four hours per week for one semester, comprising two hours of lectures and two hours of laboratory/tutorial.</td>
<td>Final examination, 70% assignment and tests, 30%.</td>
</tr>
<tr>
<td>SCM1612</td>
<td>APPLIED STATISTICS 2</td>
<td>Footeesray Park</td>
<td>SCM1611</td>
<td>Required Reading</td>
<td>Moore, D.S. and McCabe, G.P., 1998, <em>Introduction to the Practice of Statistics</em>, 3rd edn.</td>
<td>Three hours per week for one semester, comprising two one-hour lectures and one one-hour tutorial.</td>
<td>Final examination, 70% assignment and tests, 30%.</td>
</tr>
</tbody>
</table>
Recommended Reading  Beyda, W.J. 1995, *Data Communications: Basics to BroadBand*, Prentice Hall.

Class Contact  Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment  Final examination, 80%; assignment and tests, 20%.

**SCM2112 OPERATING SYSTEMS**

Campus  Footscray Park, Hong Kong

Prerequisite(s)  SCM1113 Computer Organisation and Architecture.


Class Contact  Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment  Final examination, 70%; assignment and tests, 30%.

**SCM221I DATABASE SYSTEMS 1**

Campus  Footscray Park, Hong Kong

Prerequisite(s)  SCM111 Introduction to Computer Systems 1; SCM1312 Programming 2.


Class Contact  Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment  Final examination, 70%; assignment and tests, 30%.

**SCM221B DATABASE SYSTEMS 2**

Campus  Footscray Park, Hong Kong, Malaysia

Prerequisite(s)  SCM2211 Database Systems 1.


Required Reading  To be advised by lecturer.


Class Contact  Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment  Final examination, 70%; assignment and tests, 30%.

**SCM231I OBJECT ORIENTED PROGRAMMING 1**

Campus  Footscray Park, Hong Kong, Malaysia

Prerequisite(s)  SCM3131 Programming 1; SCM3132 Programming 2.

Content  This subject covers the critical concepts and features that support object-oriented programming. Classes and data abstraction, graphical user interfaces, threads, streams and exceptions. Multimedia and networking applications. Mastery of these concepts provide the foundation to practice object-oriented programming in a productive way and the subsequent mastery of the finer points of object-oriented programming.

Required Reading  To be advised by lecturer.


Class Contact  Three hours per week for one semester, comprising two hours of lectures and one hour of laboratory/tutorial.

Assessment  Final examination, 80%; assignment and tests, 20%.

**SCM2312 SOFTWARE ENGINEERING 1**

Campus  Footscray Park, Hong Kong

Prerequisite(s)  SCM1111 Introduction to Computer Systems 1; SCM3131 Programming 1; SCM3132 Programming 2.

Content  This subject represents an introduction to traditional software development. It is designed to prepare students for final year computer projects. Topics to be covered include: software life cycle, requirements analysis and specification, structured design, programming languages, testing strategies, documentation of software systems.

Required Reading  To be advised by lecturer.

Recommended Reading  To be advised by lecturer.

Class Contact  Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment  Final examination, 75%; assignments: 25%.

**SCM2313 SOFTWARE DEVELOPMENT**

Campus  Footscray Park, Malaysia

Prerequisite(s)  SCM2312 Software Engineering 1.

Content  This subject will introduce students to a high level application development language which supports modern graphical interfaces. Students will be expected to develop simple multimedia and/or relational database applications. It is intended that this subject together with Software Engineering 1 will prepare students for final year computing projects. Software tools such as Visual Basic, Access, JAVA.

Required Reading  To be advised by lecturer.


Class Contact  Three hours per week for one semester, comprising one one-hour lecture and two one-hour laboratory/tutorial.
SCM2314 COBOL PROGRAMMING
Campus Footscray Park
Prerequisite(s) Nil.
Content Introduction to COBOL, procedure division, editing, arithmetic statements, selection and iteration, if and perform
statements. Structured program design. File processing: sequential and indexed. Program debugging and data validation.
Control break and reporting. Arrays: single-level and multi-level.
Programming, Prentice Hall.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour
laboratory/tutorial.
Assessment Final examination, 70%; project, 30%.

SCM2411 MATHEMATICAL ECONOMICS 1
Campus Footscray Park
Prerequisite(s) SCM1612 Applied Statistics 2.
Content Fundamental economic questions, basic element
concepts and assumptions of economic models. Sources of
economic information. Comparative advantage: General
principles of demand and supply analysis, determination of
market equilibrium. Distribution of tax burden. Elasticities. The
mathematical expression of basic microeconomic functions.
Firms as economic system. Free and constrained market systems,
supply and demand, and optimisation problems of producer and
consumer. Basic financial mathematics.
Required Reading McTaggart, D., Findlay, C. and Parkin, M.
1999, Microeconomics, 3rd edn, Addison-Wesley.
Recommended Reading Quayle, M., Robinson, T. and
McEachern, W. 1994, Microeconomics, A Contemporary Introduction,
Nelson.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour
laboratory/tutorial.
Assessment Final examination, 80% assignment and tests, 20%.

SCM2412 MATHEMATICAL ECONOMICS 2
Campus Footscray Park
Prerequisite(s) SCM2411 Mathematical Economics 1.
Content Long term and short term market equilibrium.
Indifference curve and consumer demand. Perfect and imperfect
competition. Determining the effect of interference with the free
market system. Graphical and mathematical treatment of
producer’s product, pricing and investment problems.
Constrained and unconstrained maximisation and minimisation.
The economics of information. Basics of international economics: resource endowments, comparative advantage, and
exchange rates. Financial assets, capital and investment.
Required Reading Pindyck, R.S. and Rubinfeld, D.U. 2000,
Microeconomics, 5th edn, Prentice Hall.
Recommended Reading Binger, B.R. and Hoffman, E. 1998,
Microeconomics with Calculus, 2nd edn, Addison Wesley.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour
laboratory/tutorial.
Assessment Final examination, 70%; assignment: 30%
models for seasonal and non-seasonal data. Applications using 'real' data with MINITAB and SIBYL.

**Required Reading** Nil.


**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 60%; project, 30%; laboratory assessment, 10%.

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### SCM263 SAMPLING AND DATA ANALYSIS

**Campus** Footscray Park

**Prerequisite(s)** SCM1612 Applied Statistics 2.

**Content** Survey design, Finite population estimation, Determining sample size; Sampling techniques; Non-parametric methods; Exploratory data analysis; Data presentation methods; Distributions, Parameter estimation, Large data sets.


**Recommended Reading** Kish, L. 1965, *Survey Sampling*, Wiley.

**Class Contact** Three hours per week for one semester, comprising one one-hour lecture, one one-hour tutorial/practical and one one-hour laboratory.

**Assessment** Final examination, 60%; assignment and test, 40%.

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### SCM271 DISCRETE MATHEMATICS

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** SCM1711 Mathematical Foundations 1.

**Content** Algorithms— worst case and asymptotic analysis, O, Ω and Θ notation. Algorithm design — greedy algorithms, divide and conquer, dynamic programming, backtracking, notation branch and bound heuristics. Comparisons and applications. Graph theory — definitions, terminology, adjacency, incidence, paths, cycles, multigraphs, digraphs, weighted graphs, Eulerian graphs and digraphs, Hamiltonian graphs and digraphs, path algorithms, trees, graph colouring, matching.

**Required Reading** Nil.


**Class Contact** Three hours per week for one semester, comprising two hours of lectures and one hour of laboratory/tutorial.

**Assessment** Final examination, 80%; tests, 20%.

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### SCM272 ANALYSIS OF CONTINUOUS PROCESSES

**Campus** Footscray Park

**Prerequisite(s)** SCM1712 Mathematical Foundations 2.


**Required Reading** Nil.


**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 80%; assignment and test, 20%.

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### SCM2911 LINEAR PROGRAMMING

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** Introduction to linear programming, model formulation, graphical solution, simplex methods for maximisation and minimisation problems, primal and dual problems, sensitivity analysis. Special linear programming models: transportation, transhipment and assignment problems. Pure and mixed integer linear programming, branch and bound techniques for solving ILP, Knapsack problems. Use of a computer package (LINDO/LINGO) for solving LP and ILP.


**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 80%; tests, 20%.

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### SCM2912 PRODUCTION SCHEDULING

**Campus** Footscray Park

**Prerequisite(s)** Pass in four electives (advisory).

**Content** Standard Flow and Job Shop Scheduling Techniques: Single machine case, Standard results for simple problems, heuristic algorithms for minimising mean tardiness, Willkerson-Irwin’s method, extensions of Johnson’s rule, Campbell, Dudek and Smith’s method; Branch and bound, travelling salesperson problem; Aker’s graphical method; Greedy algorithms for scheduling; LP formulations and solutions. CPM and PERT: Network models for scheduling, time/cost trade-offs, crashing and indirect costs; Time-charting and resource levelling. Introduction to Inventory Theory. Materials Requirement Planning: MRP I, Closed Loop MRP, MRP II. Just-in-time Scheduling. Current Trends in Scheduling: Artificial intelligence and heuristic algorithms in scheduling.

**Required Reading** Nil.


**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 80%; assignments, 20%.

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### SCM2913 OPTIMISATION METHODS 1

**Campus** Footscray Park

**Prerequisite(s)** SCM1611 Applied Statistics 1

**Content** Decision Theory and Games: Decisions under risk and uncertainty, decision trees; Two-person zero-sum games, pure


**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 70%; assignments and tests, 30%.

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**SCM3002 PROJECT 2**

**Campus** Footscray Park, Malaysia

**Prerequisite(s)** 10 Electives

**Content** This subject is based and involves projects with industry sponsors selected by the University. Students work in groups under the supervision of an Academic Staff member. For computing projects students are required to submit a specification document, a final project report and demonstrate the software. For non-computing projects students are required to submit a project specification and a final project report. In addition, all groups present progress and final oral presentations to other students, staff and industry partners.

**Required Reading** Nil.

**Recommended Reading** Nil

**Class Contact** 45 hours per week

**Assessment** Based on performance in the projects oral presentations and quality of final reports.

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**SCM111 DATA COMMUNICATIONS AND NETWORKS 2**

**Campus** Footscray Park

**Prerequisite(s)** SCM2111 Data Communications and Networks 1.


**Recommended Reading** Halsall, F., *Data Communications, Computer Networks and Open Systems*, 4th edn, Addison Wesley.

**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 80%; assignment and tests, 20%.

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**SCM312 USER INTERFACE DESIGN**

**Campus** Footscray Park, Hong Kong, Malaysia

**Prerequisite(s)** SCM1111 Introduction to Computer Systems 1, SCM1112 Introduction to Computer Systems 2, plus 8 electives.


**Required Reading** To be advised by the lecturer.


**Class Contact** Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

**Assessment** Final examination, 50%; assignment and tests, 50%.

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**SCM313 MULTIMEDIA SYSTEMS DESIGN**

**Campus** Footscray Park

**Prerequisite(s)** SCM1111 Introduction to Computer Systems 1; SCM1112 Introduction to Computer Systems 2.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 50% assignment and tests, 50%.

SCM314 PARALLEL PROCESSING

Campus Footscray Park

Prerequisite(s) SCM1111 Introduction to Computer Systems 1; SCM1113 Computer Organisation and Architecture.


Required Reading Nil.


Class Contact Three hours per week for one semester, comprising 2 one-hour lectures and 1 one-hour laboratory class.

Assessment Final examination, 70% assignment and tests, 30%.

SCM321 DATABASE SYSTEMS 3

Campus Footscray Park

Prerequisite(s) SCM2218 Database Systems 2.

Content A selection of the topics from the following: Distributed and parallel databases, multidatabases, internet, databases. Intelligent systems, Multimedia databases.

Required Reading Nil.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 70% assignment and tests, 30%.

SCM322 INFORMATION SYSTEMS

Campus Footscray Park

Prerequisite(s) SCM2218 Database Systems 2.


Required Reading Nil.

SCM3311 OBJECT ORIENTED ANALYSIS AND DESIGN

Campus Footscray Park
Prerequisite(s) EEC3601 Windows Programming or SCM3311 Object Oriented Programming 2.
Content This is an advanced subject in object oriented analysis and design. Topics will be selected from: Designing object-oriented systems; Use case approach; UML methodology; Differences between pure and non-pure object-oriented languages; Case studies.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester, based on two hours of lectures and one hour of laboratory/tutorial.
Assessment Test, assignment and laboratory exercises: 30%, examination: 70%. A pass in each component of assessment is required for a subject pass.

SCM3411 MATHEMATICAL ECONOMICS 3

Campus Footscray Park
Prerequisite(s) SCM2411 Mathematical Economics 1.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
Assessment Final examination, 70%; assignment and tests, 30%.

SCM3412 ECONOMETRICS

Campus Footscray Park
Prerequisite(s) SCM2411 Mathematical Economics 1; SCM1611 Applied Statistics 1; SCM1612 Applied Statistics 2.
Content Theoretical background. Practical issues in regression analysis with economic data. Different functional forms, dummy variables, logit, probit, tobit models, autoregressive and distributed lag models. Time series econometrics, unit roots, cointerpretation and error correction. ARCH models and serial correlation. Identification and estimation of simultaneous equations.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
Assessment Final examination, 70%; assignment and tests, 30%.

SCM3413 FINANCIAL MODELLING

Campus Footscray Park
Prerequisite(s) SCM1711 Mathematical Foundations 1; SCM1712 Mathematical Foundations 2. SCM2411 Mathematical Economics 1 (advisory).
Content Modelling the financial flows associated with investment in financial assets and other commercial projects. The riskless investment: Financial mathematics; compound interest and applications to the present-value and future-value of a sequence of dated cash flows; applications to annuities and mortgages or alternative financial products; internal rate-of-return. security pricing and Valuation of Financial Instruments: Bonds; interest rate risk, duration and convexity; shares, financial ‘arithmetic’ and the dividend discount model; derivative instruments (options and futures); the Black-Scholes model. Portfolio Theory and asset Classes: Risk reduction via diversification; the Markowitz mean-variance optimisation process and efficient portfolios; the Capital Asset Pricing Model and related topics; the principle of financial leverage. Derivative instruments, futures, markets, swaps and options.
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
Assessment Final examination, 60%; assignment and tests, 40%.

SCM3511 IMAGE PROCESSING 2

Campus Footscray Park
Prerequisite(s) SCM2511 Image Processing
Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
Assessment Final examination, 70%; assignment and tests, 30%.

SCM3512 MATHEMATICAL TECHNIQUES IN IMAGE PROCESSING

Campus Footscray Park
Prerequisite(s) SCM2511 Image Processing plus one of SCM2711 Discrete Mathematics or SCM2712 Analysis of Continuous Processes.
Content Image transforms – Fourier, Walsh, Hadamard, wavelet. Geometry and topology – distance transforms, metrics, paths,
SCM3611 REGRESSION ANALYSIS

Campus Footscray Park
Prerequisite(s) SCM2611 Linear Statistical Models.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one hour of problem solving using the computer package SPSS for Windows.

Assessment Final examination, 60%; assignment, 40%.

SCM3612 STATISTICS FOR MANAGING QUALITY 1

Campus Footscray Park
Prerequisite(s) SCM2611 Applied Statistics 1; SCM6122 Applied Statistics 2.

Content Fundamental 'quality' and 'quality' management issues. 'Quality' costs and the need for process control. Statistical methods for process control of discrete processes. Acceptance sampling.

Required Reading Nil.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 80%; assignment and tests, 20%.

SCM3613 TIME SERIES ANALYSIS

Campus Footscray Park
Prerequisite(s) SCM2612 Statistical Forecasting.


Required Reading Box, B. and O’Connell, R. 1993, Time Series Forecasting, 3rd edn, Duxbury.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 50%; project, 50%.

SCM3614 EXPERIMENTAL DESIGN 1

Campus Footscray Park
Prerequisite(s) SCM6112.

Content The differences between experiments and observational studies. Completely randomised and randomised block experiments. Two-level factorial and fractional factorial designs. Response Surface designs and analysis. An introduction to designs with factors at more than two levels. Taguchi methods.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester, comprising one one-hour lecture, one one-hour tutorial/practical class and one one-hour laboratory.

Assessment Final examination, 70%; assignment and tests, 30%.

SCM3615 MULTIVARIATE STATISTICS

Campus Footscray Park
Prerequisite(s) SCM2611 Linear Statistical Models, SCM2711 Discrete Mathematics.

Content A selection of topics from the following list will be covered: revision of univariate methods, classification methods, plotting and understanding multivariable datasets, multiple regression methods, weighted least squares, use of regression diagnostics, multivariate normal distribution, Hotellings T², confidence regions, discriminant analysis, principal components, tree based methods.


Class Contact Three hours per week for one semester, comprising two hours of lectures and one hour of laboratory/tutorial.

Assessment Final examination, 75%; assignments: 25%.

SCM3616 SYSTEM RELIABILITY AND MAINTENANCE

Campus Footscray Park
Prerequisite(s) SCM1612 Applied Statistics 2; SCM1711 Mathematical Foundations 1; SCM1712 Mathematical Foundations 2.


Required Reading Nil.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 80%; Assignment and tests, 20%.

SCM3713 DISCRETE MATHEMATICAL MODELLING

Campus Footscray Park

Prerequisite(s) SCM2711 Discrete Mathematics.

Content A selection from: Petri nets; Chaos and Fractals; z-transforms; Combinatorics; Data Compression and Transmission.

Required Reading Nil.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 80%; assignment and tests, 20%.

SCM3911 SIMULATION

Campus Footscray Park, Hong Kong

Prerequisite(s) Pass in eight electives (advisory). Students should have successfully completed second year.

Content On completion of the subject, students should be able to: understand the philosophy and concepts of simulation; have a good knowledge and understanding of a modern simulation language including principles of modelling; design, justify, and implement computer-based models of the operation of manufacturing and business systems.

Required Reading SCM3911 Lecture Notes.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 70%; assignment and tests, 30%.

SCM3912 OPTIMISATION METHODS 2

Campus Footscray Park

Prerequisite(s) SCM1611 Applied Statistics 1; SCM2911 Linear Programming

Content Review of LP and simplex, dual simplex; Introduction to Karmarkar’s interior-point algorithms; Multicriteria optimisation, goal programming. Introduction to nonlinear programming; Convex and concave functions; Golden Section search, method of steepest ascent/descent, Lagrange multipliers, Kuhn-Tucker conditions. Dynamic programming: model formulation, forward and backward recursions, dynamic programming and LP, deterministic and stochastic dynamic programming. Heuristic algorithms, introduction to modern methods of heuristic search.


Class Contact Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.

Assessment Final examination, 70%; assignment and tests, 30%.

SCS1000 COURSE OVERVIEW AND GUIDANCE

Campus Werribee

Prerequisite(s) Nil.

Content The subject will reinforce the students’ understanding of the course structure and clarify various options within the course. Possible career paths relating to the application of chemistry to medical and forensic science will be explored with the assistance of guest presentations by invited professionals working in relevant areas. The possibility of proceeding to Honours and Postgraduate Studies will also be discussed.

Required Reading To be advised.

Class Contact One hour of lectures/discussion groups over one semester. Attendance is compulsory.

Assessment Assignment, 80%; Oral presentation, 20%.

SCS1003 CHEMISTRY 1E

Campus Werribee

Prerequisite(s) Nil.

Content Topics will include chemistry methods and measurements; atomic theory and the periodic table; structures and properties of ionic and covalent compounds; chemical equation, reactions and solutions; states of matter; chemical and physical changes (energy, rate and equilibrium); Acids-bases and oxidation-reduction reactions; the nucleus, radioactivity and nuclear medicine; Organic chemistry-saturated and unsaturated hydrocarbons; alcohol phenols, thiols and ethers; aldehydes and ketones; carboxylic acids and their derivatives; amines and amidcs; biological chemistry.

Recommended Reading Denniston, Topping, Caret, General, Organic and Biochemistry, 3rd edn, McGraw-Hill. Laboratory manuals as directed.

Class Contact Seven hours per week for two semesters normally comprising of three hours per week lectures, one hour per week tutorial and three hours per week practical work.

Assessment Each semester will be assessed by examination, 75%, assignment, 10% and practical work 15%. The year grade will be a combination of the semester results.

SCS110 CHEMISTRY FOR BIOLOGICAL SCIENCES A

Campus St Albans

Prerequisite(s) Nil.

Content Chemistry relevant to biological sciences including the topics which follow: Matter and energy, Measurement, Atomic theory and the periodic table, Chemical and physical bonding, Chemical formulae, reactions and equations, Molecular structure and the state of matter, Solutions and aqueous chemistry.


Recommended Reading To be advised by lecturer.

Class Contact Six hours per week for one semester comprising three hours of lectures, one hour tutorial and two hour practical classes.

Assessment Assignment, 10%; Practical work, 20%; Examination, 70%.

SCS1120 CHEMISTRY FOR BIOLOGICAL SCIENCES B

Campus St Albans

Prerequisite(s) SCS1110 Chemistry for Biological Sciences A or equivalent.

Content Chemistry topics relevant to biological sciences and which incorporate specific reference to biological systems. Topics will include the following: Basic physical chemistry including chemical equilibrium and kinetics, acids and bases, Thermochemistry, Oxidation and reduction, Inorganic and nuclear chemistry with reference to selected elements of biological chemistry, Organic chemistry and biological chemistry.


Recommended Reading To be advised by lecturer.

Class Contact Six hours per week for one semester comprising three hours of lectures, one hour tutorial and two hour practical classes.

Assessment Assignment, 10%; Practical work, 20%; Examination, 70%.
SCS1500 CHEMISTRY AND BIOLOGY

Campus Footscray Park

Prerequisite(s) Nil.

Content Semester one: Fundamental concepts from general chemistry including: modern atomic theory and the periodic classification of elements; various types of chemical bonding between atoms; chemical reactions, equations, quantities and calculations using molar/equivalent entities and stoichiometric balances; the nature of solutions, solubility products, acid-base theory and reactions and the concept of pH; introduction to electrochemistry and oxidation-reduction reactions; reaction equilibrium constants and reaction kinetics; introduction to organic chemistry via polymer chemistry. Semester two: Characteristics of the living condition, the chemical and structural basis of life, cells and their environment, photosynthesis, respiration, cell energy and growth. The diversity of life. Basic biology of plants and animals, including their natural history, evolutionary history and phylogeny, systematics and taxonomy (including basic classification), structure and function, anatomy and physiology. Importance of maintenance of biological diversity and brief introduction to ecology.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for two semesters based on 1.5 hours lectures and 1.5 hours tutorials/laboratory sessions.

Assessment Assignments, laboratory reports and unit tests, 50%; end-of-semester examinations, 50%. A satisfactory level of assessment for each component is required for a subject pass.

SCS1501 MEDICAL, FORENSIC AND ANALYTICAL CHEMISTRY

Campus Footscray Park

Prerequisite(s) Nil.

Content Stoichiometry, chemical equations and solution chemistry. The mole concept. Chemical equilibrium. Introduction to chemical quantitation. Basic concepts relevant to the topic of chemical homeostasis medical conditions associated with the disturbance of chemical homeostasis. Methods of analysis used in medical/clinical chemistry. Students will also be introduced to the principles and methodology of forensic chemistry. The role of the forensic chemist in dealing with legal issues will be addressed including the presentation of evidence in a court of law.


Recommended Reading To be advised by lecturers.

Class Contact Two hours of lectures per week for two semesters.

Assessment A combination of assignments, short tests and semester examinations.

SCS2000 INDUSTRIAL EXPERIENCE 2

Credit Points 15 per semester for two semesters.

Campus Footscray Park

Prerequisite(s) Nil.

Content No formal content, but student will be required to provide evidence of appropriate industrial experience, acceptable to the Head of School. Students should consult with appropriate staff prior to commencing the subject to ensure this situation is acceptable to the School.

Class Contact No set contact hours.

Assessment Evidence of appropriate industrial experience in the form of a letter from the employer detailing the experience is required.

SCS2001 MINOR PROJECT

Campus Footscray Park

Prerequisite(s) Nil.

Content The subject aims to develop understanding and skills related to setting up, conducting and successfully completing, an occupational health and safety project. Methodologies; ergonomics, incident investigation, occupational hygiene, risk analysis, system safety. Problem formulation and problem definition, project management, publication of project outcomes, case studies.


Class Contact Three hours of lectures/tutorials per week for one semester.

Assessment Practical assignments (2 x 40%), 80%; oral class presentation, 20%.

SCS2071 BIOLOGICAL CHEMISTRY

Campus Footscray Park

Prerequisites Nil.

Content The aim of this unit is to cover chemical, biological and biochemical topics that have relevance to occupation health professionals. Initially this unit will review basic chemical concepts and aspects of physical and organic chemistry that relate to biological and health science studies. Where possible particular emphasis is placed on the functional characteristics of biological molecules. The later topics deal with the interaction of xenobiotics with biological molecules. This entails the description of hypotheses on the actions of volatiles on the neuron membrane, enzyme inhibition and drug-receptor theory. Aspects of pharmacogenetics, drug tolerance, substance abuse and allergies are also covered.


Class Contact Two hour lecture or tutorial per week for one semester.

Assessment Assignment (40%) and a case study (60%).

SCS2101 TASK ANALYSIS AND JOB DESIGN

Campus Footscray Park

Prerequisite(s) Nil.

Content Descriptive task analysis techniques, inferential task analysis techniques, the benefits of task analysis, the task analysis statement, history of job design, techniques of job design, measures of job design, the benefits of improved job design, who wants to know about job design?
SCS2250 PROCESS ENGINEERING 1
Campus Werribee
Prerequisite(s) Students would normally be expected to have successfully completed SPH1210 Physics 1F and SMA1110 Mathematics 1.
Content The subject aims to introduce students to basic engineering principles and to unit operations involved in food processing. Topics covered include: dimensions and units; material and energy balances; process flow diagrams; fluid flow theory and applications; heat transfer theory, applications and equipment; mechanical separation processes; instrumentation and control.
Required Reading To be advised by lecturer.
Class Contact Four hours per week comprising lectures and tutorials for one semester.
Assessment Assignments, 30%; final examination, 70%.

SCS2270 ENVIRONMENTAL SCIENCE A
Campus Footscray Park
Prerequisite(s) SCS1500 Chemistry and Biology (for Environmental Engineering students only)
Co-requisite(s) EZW2110 Principles of Material Science (for Civil Engineering students only)
Content Semester One: Overview of man made and natural environmental problems. Materials and energy balances. Introduction to climate, meteorology, atmospheric phenomena and a hydrologic cycle. Measurement of precipitation, evaporation and stream flow. Basic principles of ecology; ecosystem structure and biomes, trophic level and productivity, chemical cycling, ecological niches, changes in ecosystems, land carry capacity, urban systems vs natural ecosystems.
Semester two: Review of important concepts from general chemistry. Introduction to organic chemistry and organic waste materials. Key parameters in water chemistry and review of solubility considerations and precipitation. Basic concepts on colloids, Fundamentals of soil chemistry, soil solutions, importance and availability of key elements, soil pH. The major gases and introduction to air chemistry. Microbiology major microbial groups conditions for growth and population dynamics, effects of microbes on the environment, role in disease transmission and epidemiology.
Class Contact Three hours per week for two semesters based on two hours lectures and one hour laboratory/tutorial sessions.
Assessment Assignments and laboratory work, 30%; end of semester examinations, 70%. A satisfactory level of assessment for each component is required for a subject pass.

SCS2301 STUDY DESIGN
Campus Footscray Park
Prerequisite(s) Nil.

SCS2372 TOXICOLOGY 1A
Campus Footscray Park
Prerequisites SCS1051 Chemistry for Occupational Health and Safety and SBM1270 Human Biology or equivalent units
Content The dose determines if a chemical produces a toxic or no toxic response and this is the basic tenet of this unit. Topics will introduce students to principles applied to studying dose and toxic responses attributable to substances. This can be sectioned into four modules. These are toxicology and society; thresholds and the dose response effects; toxicokinetics and biotransformation; and mechanisms of toxicity. The unit also covers sources of chemical and toxicological information and how to approach the assessment of a problem involving a chemical hazard that will cause toxic injury. On completion of the unit, students are expected to be familiar with mechanisms of toxicity and the way that sensitive cells can be affected by specific substances as well as recognising the ways that the body process xenobiotics.
Class Contact Two hour lectures or tutorials for one semester.
Assessment Assignments (65%) and a case study (35%)

SCS2373 TOXICOLOGY 1B
Campus Footscray Park
Prerequisites SCS2372 Toxicology 1A
Content The unit covers the possible adverse effects from exposure to hazardous chemicals in work environments. Topics include the description of adverse outcomes such as neurotoxicity, hepatotoxicity and carcinogenicity that follow exposure to specific substances. In covering these and other toxic outcomes the student will recognise various substances that have documented effects on the nervous, reproductive, cardiovascular, renal and hepatic systems, or are listed as genotoxins, mutagens or carcinogens. On completion of the unit, students are expected to be familiar with substances that show specific toxicological effects and recognise the mechanism of toxicity for specific drugs, solvents, metals and pesticides. Additional topics discussed in this subject are biological monitoring, health surveillance, ecotoxicology; effects of food toxins, and ionising radiation and electromagnetic field effects. Part of the unit assessment involves reviewing toxicology and occupational medicine journal articles.
Class Contact Two hour lectures or tutorials for one semester.
Assessment Assignment (65%) and a case study (35%)

SCS2381 BIOCHEMISTRY 1
Campus Footscray Park

SCS2301 STUDY DESIGN
Campus Footscray Park
Prerequisite(s) Nil.
Prerequisite(s) SCS1501 Medical Forensic and Analytical Chemistry 1, SCS1006 Chemistry 1.

Content This subject aims to give an overview of the bases of biochemical analysis. Topics covered include enzymes; bioenergetics; metabolism; hormone action and hormonal regulation of blood glucose. The practical component of this subject emphasises the application of analytical techniques in biochemistry.

Required Reading To be advised by the lecturer.

Class Contact Two hours of lectures and one three-hour laboratory session.

Assessment Based upon practical reports, a practical examination, short tests and an end-of-semester examination.

SCS2431 ENVIRONMENTAL MEASUREMENT & ANALYSIS 1

Campus Footscray Park.

Prerequisite(s) SCS1006 Chemistry 1, SBM1518 Human Physiology 1.

Co-requisite(s) Nil.

Content To familiarise students with the fundamental concepts and methods of environmental measurement and analysis (EMA) and to provide practical experience in some of the more widely used methods. Overview of the environmental and environmental sampling procedures. Transport of pollutants in the environment. Techniques and equipment used in environmental sampling and measurement. Experimental designs in EMA including controls and blanks, introductory random sampling, field data manipulation, optimal sample size, introduction to factorial designs and latin squares. Selected experimental methods used in EMA. [NOTE: This subject is a revised version of the existing subject SCS2421 Environmental Measurement and Analysis, and is deemed to be equivalent in content to the latter.]


Class Contact Six hours per week for one semester comprising two hours of lectures, one one-hour tutorial and one three-hour laboratory session.

Assessment Practical work 40%, final examination 60%.

SCS246I RISK MANAGEMENT

Campus Footscray Park

Prerequisite(s) Nil.

Content Testing risk analysis data, single risk or total risk?, risk management plans or action plans, financial plans, vulnerability; financial, legal, public relations, counting the cost, responsibility for risk management.


Class Contact Two hours of lectures/tutorials per week for one semester.

Assessment Written assignments (30%, 30% and 40%), 100%.

SCS2502 MEDICAL CHEMISTRY 2

Campus Footscray Park

Prerequisite(s) SCS1006 Chemistry 1, SCS1501 Medical, Forensic and Analytical Chemistry 1


Recommended Reading To be advised by lecturer

Class Contact Two hours of lectures and three hours of practical classes per week for one semester.

Assessment A combination of assignments, practical work, short tests and a final examination.

SCS2503 FORENSIC CHEMISTRY 2

Campus Footscray Park

Prerequisite(s) SCS1006 Chemistry 1; SCS1501 Medical, Forensic and Analytical Chemistry 1

Content This subject draws upon real life investigations to introduce students to forensic chemical techniques. Modern methods of analysis and materials identification will be studied as applied to crimes against property such as arson, burglary, vehicle accidents and theft; crimes against the person such as assault, sexual offences and murder; and crimes involving the possession, illicit manufacture and distribution of drugs of abuse.

Required Reading To be advised by lecturer.

Class Contact Two hours of lectures and three hours of practical classes per week for one semester.

Assessment A combination of assignments, practical work, short tests and a final examination.

SCS2510 ANALYTICAL CHEMISTRY 2

Campus Footscray Park

Prerequisite(s) SCS1006 Chemistry 1


Required Reading To be advised by lecturer.

### Class Contact
Two hours per week of lectures/tutorials over two semesters and three hours of laboratory classes per week. Students are expected to attend all scheduled classes.

### Assessment
Students will be assessed on the basis of assignments, laboratory work and examination of both the practical work and lecture material. Satisfactory practical work is a co-requisite for passing the subject. An N1 or N2 result will mean that the subject has to be repeated; it is not possible to set aside a fail result in SCS2510 through stage completion by compensation.

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#### SCS2521 APPLIED CHEMISTRY 2 - ORGANIC

<table>
<thead>
<tr>
<th>Campus</th>
<th>Footscray Park</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>SCS1006 Chemistry 1</td>
</tr>
<tr>
<td>Content</td>
<td>The aims of this subject are to introduce students to fundamental aspects of synthetic organic chemistry, organic reaction mechanisms along with applications of spectroscopy to organic chemistry. Aromaticity. Electrophilic and nucleophilic aromatic substitution – use in synthesis. Physical, organic chemistry, spectroscopy, including UV, IR, NMR and mass spectroscopy. Chemistry of carbanions – applications in synthesis. The chemistry of free radicals. The chemistry of carbocations. Organic synthesis, particular emphasis will be placed on the relationship of this chemistry to industrial chemistry. Practical exercises providing substantial 'hands-on' experience with chromatographic and spectroscopic instrumentation will complement the lecture material.</td>
</tr>
<tr>
<td>Class Contact</td>
<td>Five hours per week for 2 semesters, comprising two hours of lectures and three hours of practical work.</td>
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<tr>
<td>Assessment</td>
<td>End-of-semester examination, 60%; practical work 20% and two assignments 20%.</td>
</tr>
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#### SCS2562 ENVIRONMENTAL CHEMISTRY

<table>
<thead>
<tr>
<th>Campus</th>
<th>St Albans</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>SCS1531/1542 Chemistry 1B/2B or SCS1511/1522, Chemistry 1A/2A.</td>
</tr>
<tr>
<td>Content</td>
<td>Basic principles of environmental chemistry. The chemistry of the air, water and land, and the relationship between them. Sources of pollution including industry and agriculture.</td>
</tr>
<tr>
<td>Required Reading</td>
<td>Manahan, S.E., Environmental Chemistry, Lewis Publishers.</td>
</tr>
<tr>
<td>Class Contact</td>
<td>Four hours of lectures per week for 1 semester.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Assignments, 40%; final examination, 60%.</td>
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</tbody>
</table>

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#### SCS2580 CHEMISTRY 4F

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<thead>
<tr>
<th>Campus</th>
<th>Werribee</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>SCS1003 Chemistry 1E</td>
</tr>
<tr>
<td>Content</td>
<td>The mathematical basis of physical chemistry. Aspects of thermodynamics, kinetics, electrochemistry and surface chemistry which are applicable to the food industry, and are of environmental, biological and industrial importance. Bonding theories as they apply to inorganic and organometallic systems. Spectroscopy in inorganic chemistry. Inorganic and organometallic reaction mechanisms. Inorganic and organometallic chemistry in industry. Bioinorganic chemistry including the essential trace elements, chemical speciation, trace element toxicity, metalloproteins and metalloenzymes, the biochemistry of iron and other metals, biological electron transfer, bioinorganic modelling, alkali and alkaline earths in biological systems, metal complexes as chemotherapeutic agents.</td>
</tr>
<tr>
<td>Class Contact</td>
<td>Three hours per week for one semester, comprising three hours of lectures tutorials. Plus twelve hours of laboratory comprising four laboratories of three hours.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Study guides, 10%; assignments and practical work, 30%; final examination, 60%.</td>
</tr>
</tbody>
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#### SCS2610 PLASTICS IN THE ENVIRONMENT

<table>
<thead>
<tr>
<th>Campus</th>
<th>Footscray Park</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>Nil.</td>
</tr>
<tr>
<td>Co-requisite(s)</td>
<td>Nil.</td>
</tr>
<tr>
<td>Content</td>
<td>The aim of this subject is to identify the common synthetic polymers that are used by our society and to consider how the mechanical properties, and hence the service lives, of these are influenced by the environmental factors of heat, light and biological activity. Topics to be covered include: the identities and chemical structures of the commercially important synthetic polymers; an introduction to the principles of thermal and photochemical degradation and stabilisation of synthetic polymers; biological degradation of some synthetic polymers such as polyethylene; the benefits and disadvantages to the environment of polymer degradation and stabilisation; techniques for measuring rates of degradation; accelerated degradation.</td>
</tr>
<tr>
<td>Class Contact</td>
<td>Six hours per week for one semester comprising one two-hour lecture, one one-hour tutorial and one three-hour laboratory session.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Practical work 40%, final examination 60%.</td>
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#### SCS2620 INDOOR AIR QUALITY

<table>
<thead>
<tr>
<th>Campus</th>
<th>Footscray Park</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>SCS1003 Chemistry 1E</td>
</tr>
<tr>
<td>Co-requisite(s)</td>
<td>Nil.</td>
</tr>
<tr>
<td>Content</td>
<td>To provide an understanding of the concepts and important techniques used in the assessment and control of indoor air quality. Topics covered in the course will include: the importance of indoor air quality (IAQ) in modern society; types of volatile organic compounds (VOCs) in indoor air; sources and sinks of VOCs; techniques of measuring VOCs; sick building syndrome; other considerations in IAQ analysis – microbiological organisms and dust particulates; methods of reducing VOCs in indoor air.</td>
</tr>
<tr>
<td>Class Contact</td>
<td>Two hours of lectures per week for one semester.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Final examination 80%; assignments and written work 20%.</td>
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<tr>
<td>Course Code</td>
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<td>SCS3301</td>
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<td>SCS3361</td>
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SCS301 OCCUPATIONAL HEALTH AND SAFETY
BEST PRACTICE
Campus Footscray Park
Prerequisite(s) Nil.
Content The subject will provide an understanding of occupational health and safety practices which are effective in corporate settings; the occupational health and safety practices which are effective in consulting settings; and the occupational health and safety practices which are effective in governmental settings. The content will also cover the evaluation of the setting and selection of occupational health and safety practices which will be appropriate, including the selection of occupational health and safety practices with which the student can be comfortable.
Required Reading Kuhn, M. 1993, How to Select and Use Consultants, ILO, Geneva. (No.51 in the Management Development series.)
Class Contact Two hours of lecture/tutorials per week for one semester.
Assessment The assessment will be two take home assignments. One of these involves evaluation of a consultant’s proposal (1500 words – 30%) and the other is a practical exercise, a final report on a safety case study (3000 words – 70%).

SCS341 ENVIRONMENTAL LEGISLATION
Campus St Albans
Prerequisite(s) Nil.
Required Reading To be advised by lecturer.
Class Contact Four hours of lectures per week for one semester.
Assessment Fieldwork and assignments, 40%; examinations, 60%.

SCS341I ENVIRONMENTAL MEASUREMENT & ANALYSIS 2
Campus Footscray Park
Prerequisite(s) SCS1003 Chemistry 1E, SBF1310 Biology 1
Co-requisite(s) Nil.
Content To provide an understanding of important techniques and instrumental methods used in environmental measurement and analysis (EMA) and to provide practical experience in some of the more widely used methods. A detailed discussion of selected instrumental methods commonly used in modern EMA programs will be presented and illustrated by accompanying laboratory exercises. The methods will be drawn from a list which includes: fluorimetry, UV-visible spectrophotometry, chromatography, conductivity, electrochemical analysis and atomic absorption spectrophotometry. Emphasis will be placed on the analytical protocols and the use of modern instrumentation as analytical tools in EMA rather than theory of instrumental operation. [This subject can be undertaken as an extension to the material presented in SCS2431 Environmental Measurement and Analysis 1. However, the subject focuses more on the application of modern instrumental methods to EMA and, as such, is considered to be a separate subject.]
Class Contact Six hours per week for one semester comprising two hours of lectures, one-hour tutorial and one three-hour laboratory session.
Assessment Practical work 40%, final examination 60%.

SCS3481 LIQUID AND SOLID WASTES
Campus St Albans
Prerequisite(s) SCS2413 Introduction to the Environment; SCS2432 Environmental Science.
Content Liquid Wastes Nature and treatment; domestic and industrial; preliminary and non-biological treatments; biological treatment processes; disposal; water reclamation and use; legal considerations. Solid Wastes Nature and treatment; collection strategies; disposal methods; recycling; waste minimisation; the handling and disposal of hazardous and toxic wastes; legislative aspects.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for two semesters.
Assessment Practical work and assignments, 30%; examination, 70%.

SCS3492 AIR QUALITY MANAGEMENT
Campus St Albans
Prerequisite(s) SCS2413 Introduction to the Environment; SCS2432 Environmental Science.
Content Nature, measurement and control; monitoring, sampling and analytical techniques of air pollutants; engineering aspects; design and optimisation of air pollution monitoring and control equipment; legal considerations.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester.
Assessment Assignments, practical work, 30%; final examination, 70%.

SCS3502 MEDICAL CHEMISTRY 3
Campus Footscray Park
Prerequisite(s) SCS2502 Medical Chemistry 2, SCS2381 Biochemistry 1
Content The chemistry of body secretions (urine, saliva, tears), blood and blood borne effectors of cellular function (hormones, neurotransmitters). The chemistry of complex interactions between biomolecules. Advanced physico-chemical and biochemical methods of body fluid analysis for diagnosing diseases of various organ systems. 3-D drug design. Chemical synthesis of drugs and compounds mimicking natural molecules. Methods used to assess the purity of synthetically generated products. Methods for bioassaying chemically synthesized compounds.
Required Reading To be advised by lecturer.
Class Contact Two hours of lectures and four hours of practical classes per week for two semesters.
Assessment A combination of assignments, practical work, short tests and a final examination.
SCS3503 FORENSIC METHODS 3  
Campus Footscray Park  
Prerequisite(s) SCS2501 Analytical Chemistry 2, SCS2503 Forensic Chemistry 2  
Content Following on from Forensic Chemistry 2, Forensic Methods 3 provides training in sophisticated methods of analysis as currently applied to the examination of materials that have in some way been associated with crime.  
Recommended Reading To be advised by lecturer  
Class Contact Two hours of lectures and three hours of practical classes per week for two semesters  
Assessment A combination of assignments, practical work, short tests and a final examination.

SCS3510 APPLIED CHEMISTRY 3 - ANALYTICAL  
Campus Footscray Park  
Prerequisite(s) SCS2510 Analytical Chemistry 2  
Content The aims of this subject are to introduce students to advanced analytical and organic chemistry including low level analyses of real samples, the application of sophisticated spectrscopic techniques and the role of chemistry in an industrial environment. Absorption and emission spectroscopy, principles, instrumentation, interferences, techniques, applications, flameless AAS. Electrochemical methods: Ion-selective, electrodes, modern polarography, stripping voltametry. Flow injection analysis. Capillary electrophoresis. Chemical literature and the use of library resources; modern trends in chemical analysis; review of analytical methodologies; an operational model for analytical chemistry; evaluation and the criticism of analytical results; development of new analytical methods and trends in analytical research; project planning; selection and purchase of analytical equipment and apparatus; optimisation of analysis; specialised techniques of analysis including thermal methods, FTIR and techniques for surface analysis. Applications of advanced spectroscopy to organic analysis and structure elucidation. Study of carbohydrates, lipids, terpenes, steroids, heterocycles and proteins. Toxicology. Reaction mechanisms in photochemistry and molecular reactions. Practical work providing substantial ‘hands-on’ experience will complement the lecture material.  
Recommended Reading Students will be referred to various texts and journals during the subject and will be expected to read widely from them.  
Class Contact Six hours per week for two semesters, comprising three hours of lectures and three hours of practical work.  
Assessment End-of-semester examination 60%; practical work 20% and assignments (2), 20%.

SCS3570 INDIGENOUS SOCIETY AND ENVIRONMENTAL MANAGEMENT  
Campus St Albans  
Prerequisite(s) Nil.  
Required Reading To be advised by lecturer.  
Class Contact One two-hour lecture per week for one semester.  
Assessment Assignments and class participation.

SCS3913 PROJECT - ENVIRONMENTAL MANAGEMENT  
Campus St Albans  
Prerequisite(s) Successful completion of years 1 and 2 is normally required.  
Content Project Methodology Problem formulation. Statement of experiment. Literature searching. The null hypothesis. Experimental design. Analysis design. Research plan preparation. Project A variety of projects will be offered. The project will be concerned with a real problem and will require the presentation of an oral and written report and may form all or part of a research publication. The nature of the project will be chosen by the student in consultation with staff members.  
Required Reading To be advised by lecturer.  
Class Contact Two hours lecture per week for one semester (project methodology), and six hours practical work per week for a second semester (project).  
Assessment A choice of research project will be made and an assignment concerned with establishing the methodology for this project will be assessed and will contribute 10% to the overall assessment of the project. The written project will contribute 70% and the oral presentation will contribute 20% to the overall assessment.

SCS4000 HONOURS RESEARCH PROJECT  
Campus Footscray Park, St Albans, Werribee.  
Prerequisite(s) Satisfactory completion of an undergraduate degree program with a credit average in the final year; or at the discretion of the Course Co-ordinator.
Content The aim of the project is to enable students to conduct a research project under supervision. The project will comprise a scientific investigation in an area of expertise of the project supervisor. The results of the project will be reported in an oral presentation and a written thesis, which will include an introduction, a description of methodology, results, a discussion of the results (including a critical appraisal of the results) and recommendations for further research in the area.

Required Reading To be advised by the supervisor.

Class Contact No formal contact hours, although a normal fulltime load is considered 20 hours per week. Regular meetings with the supervisor are recommended.

Assessment The research project will be assessed on the basis of the literature review, the oral presentation and the quality of the research and its presentation in the thesis.

SCS4201 HONOURS COURSEWORK

Campus Footscray Park

Prerequisite(s) Satisfactory completion of an appropriate undergraduate degree program.

Content This subject, the aim of which is to enable students to competently research an area of study utilising knowledge and skills gained in previous studies, consists of a project carried out by students on an individual basis. The project is expected to be a scientific investigation of an approved topic, followed by the submission of a suitably formatted thesis in which the topic is introduced and formulated; the scientific investigation described in detail; results and conclusions from the study are elaborated; and an extended discussion presented.

Required Reading To be advised by supervisor.

Class Contact No formal Class Contact. However, there will be regular meetings with the students’ supervisors. As a guide, the load associated with each element of SCS4201 will be similar to that of a one-semester subject involving 1-2 hours of contact each week.

Assessment The assessment of each piece of coursework will be carried out by the staff member concerned.

SCS4600 HONOURS RESEARCH PROJECT

Campus Footscray Park

Prerequisite(s) Satisfactory completion of an appropriate undergraduate degree program.

Content This subject, the aim of which is to enable students to competently research an area of study utilising knowledge and skills gained in previous studies, consists of a project carried out by students on an individual basis. The project is expected to be a scientific investigation of an approved topic, followed by the submission of a suitably formatted thesis in which the topic is introduced and formulated; the scientific investigation described in detail; results and conclusions from the study are elaborated; and an extended discussion presented.

Required Reading To be advised by supervisor.

Class Contact No formal Class Contact. However, there will be regular meetings with the students’ supervisors.

Assessment The thesis will constitute 54% of the overall assessment and will be assessed by at least three academics from an appropriate area of expertise. Two oral presentations will contribute 10% of the overall assessment.

SMA1010 INTRODUCTORY MATHEMATICS

Campus Footscray Park

Prerequisite(s) Nil.


Required Reading To be advised by lecturer.

Recommended Reading Heffernan, J. et al. 1995, Mathematical Methods, V.C.E. Units 3 & 4, Jacaranda.

Class Contact Four hours per week for two semesters based on two hour lectures and two hour tutorial sessions.

Assessment Tests and assignments, 40%; one three-hour examination at the end of each semester, 60%. A satisfactory level of assessment for each component is required for a subject pass.

SMA1071 MATHEMATICS 1 PART 1

Campus Footscray Park

Prerequisite(s) At least one VCE Levels 3 and 4 Mathematics.


Recommended Reading Victoria University publications as advised by the lecturer.

Class Contact Four hours per week for one semester comprising lecture and tutorial work.

Assessment Mid-semester test, 35%; end-of-semester examination, 65%.

SMA1081 MATHEMATICS 1 PART 2

Campus Footscray Park

Prerequisite(s) SMA1071 Mathematics 1 Part 1.


Recommended Reading Victoria University publications as advised by the lecturer.

Class Contact Four hours per week for one semester comprising lecture and tutorial work.

Assessment Mid-semester test, 35%; end-of-semester examination, 65%.
SMA1110 MATHEMATICS 1

Campus St Albans, Werribee

Prerequisite(s) Year 12 mathematics or equivalent recommended.

Content This subject aims to provide students with a good knowledge of the methods and applications of the calculus of single variable functions. The precalculus material will focus on a study of functions and their graphs including polynomial, reciprocal, rational, hybrid, modulus, implicit, exponential, logarithmic, circular, inverse circular and hyperbolic functions. Differential calculus will cover limits and continuity, differentiation from first principles, derivatives by rule, techniques of differentiation and applications of differentiation. Integral calculus will include antiderivatives, standard integrals, integration techniques, definite integrals, fundamental theorem of calculus and applications of integration. Ordinary differential equations will cover solutions of first and second order differential equations, verification of solutions to more complex differential equations and applications to physical problems.

Required Reading To be advised by lecturer.

Class Contact Four hours per week for one semester comprising lectures and tutorials.

Assessment Assignments, tests and final examination; relative weightings to be advised by lecturer.

SMA1120 MATHEMATICS 2

Campus St Albans, Werribee

Prerequisite(s) Year 12 mathematics or equivalent recommended.

Content The main aim of this subject is to provide science students with a good knowledge of statistics relevant to further studies in their field. It will also include a study of matrices and vectors. Matrices matrix arithmetic and elementary matrix algebra; determinant of an n x n matrix for n 2; matrix method of solving linear systems.

Vectors i j k unit vector representation; vector operations including dot product and vector product; elementary vector algebra; 2D and 3D graphical representation. Descriptive Statistics: frequency distribution and graphs; measures of central tendency, variation and position. Probability distributions: binomial and normal distributions; central limit theorem. Data production: sampling techniques; design of experiments. Inferential statistics: confidence intervals; hypothesis testing; correlation.

Required Reading To be advised by lecturer.

Class Contact Four hours per week for one semester comprising lectures and tutorials.

Assessment Assignments, tests and final examination; relative weightings to be advised by lecturer.

SMA1201 MATHEMATICS IAP

Campus Footscray Park, Werribee

Prerequisite(s) Nil

Corequisite Nil


Class Contact Four hours per week based on two hour lectures and two hour tutorial sessions.

Assessment Tests 35%, end of semester examination: 65%.

SMA1202 MATHEMATICS IAQ

Campus Footscray Park

Prerequisite(s) SMA1201 Mathematics IAP

Corequisite(s) Nil


Class Contact Four hours per week based on two hour lectures and two hour tutorial sessions.

Assessment Tests 35%; end of semester examination: 65%.

SMA2031 MATHEMATICS 2 PART 1

Campus Footscray Park

Prerequisite(s) SMA1071 Mathematics 1 Part 1 and SMA1081 Mathematics 1 Part 2.

Content Numerical methods, bisection and Newton-Raphson methods of solving equations; computer programming, using the BASIC language with personal computers; calculus, partial differentiation; Second order differential equations; statistics, probability distributions, sampling, linear regression, correlation.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester comprising lectures, tutorial and laboratory work.

Assessment End-of-semester examination.

SMA2051 MATHEMATICS 2 PART 2

Campus Footscray Park

Prerequisite(s) SMA1071 Mathematics 1 Part 1; SMA1081 Mathematics 1 Part 2; SMA2031 Mathematics 2 Part 1.

Content Numerical methods: approximate integration; solution of a system of linear algebraic equations. Calculus: integration-reduction formulae, improper integrals, double integrals; differential equations, applications or ay''+by'+cy=f(x), solution of simple partial differential equations. Simple operator theory.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester comprising lecture, tutorial and laboratory work.

Assessment End-of-semester examination.
SMA2091 MATHEMATICS 2D

Campus Footscray Park

Prerequisite(s) SMA1091 Mathematics 1D.


Required Reading To be advised by lecturer.

Class Contact Five hours per week for one semester comprising lectures and tutorials.

Assessment Mid-semester test, 35%; end-of-semester examination, 65%.

SMA2201 MATHEMATICS B

Campus Footscray Park, Werribee

Prerequisite(s) SMA1201 Mathematics 1AP, SMA1202 Mathematics 1AQ.


Required Reading To be advised by lecturer.

Recommended Reading Kreyszig, E., Advanced Engineering Mathematics, Wiley.

Class Contact Four hours per week for one semester based on two-hour lectures and two-hour tutorial sessions.

Assessment End-of-semester examination, 100%.

SMA2212 MATHMATICS C1

Campus Footscray Park, Werribee.

Prerequisite(s) SMA2201 Mathematics B.

Content The subject is comprised of two units: Linear Algebra and Complex Variables.

Linear Algebra

Vector spaces, linear independence, spanning sets, basis, eigenvalues and eigenvectors, Cayley-Hamilton theorem, factorisation, quadratic forms, selected applications.

Complex Variables

Locii in the z-plane, analytic functions, Cauchy-Riemann equations, Laplace’s equation and harmonic functions. Poles, zeros, Taylor and Laurent series contour integration, Cauchy’s theorem, path independence, work done, conservative fields.

Required Reading To be advised by lecturer.


Class Contact Two hours per week for one semester comprising one hour of lectures and one hour of tutorial/laboratory sessions.

Assessment One hour mid semester test 30%, two hour end of semester examination 70%.

SMA2222 MATHMATICS C2

Campus Footscray Park, Werribee.

Prerequisite(s) SMA2201 Mathematics B.

Content The subject is comprised of two units: Numerical Methods and Complex Variables.

Numerical Methods:
Errors, accuracy, significant digits, zeros of functions, finite differences, interpolation, splines, numerical quadrature, Runge-Kutta methods for ordinary differential equations, finite difference methods for partial differential equations.

Complex Variables

Locii in the z-plane, analytic functions, Cauchy-Riemann equations, Laplace’s equation and harmonic functions. Poles, zeros, Taylor and Laurent series contour integration, Cauchy’s theorem, path independence, work done, conservative fields.

Required Reading To be advised by lecturer.


Class Contact Two hours per week for one semester comprising one hour of lectures and one hour of tutorial/laboratory sessions.

Assessment One hour mid semester test 30%, two hour end of semester examination 70%.

SMA2242 STATISTICS FOR ENGINEERS

Campus Footscray Park

Prerequisite(s) SMA1201 Mathematics 1AP, SMA1202 Mathematics 1AQ.

Content The aim of this subject is to introduce a number of important probability and statistics tools useful for solving engineering problems. Descriptive statistics and exploratory data analysis. Probability and probability distributions including the binomial, poison and normal distribution. Distributions of sums and differences of distributions. Central limit theorem. Confidence intervals and hypothesis testing. Regression methods. Introduction to two-level factorial and fractional factorial designs.
The tutorial/practical classes, aimed at providing real experience in applying statistics to engineering problems, will complement the lecture material.


**Class Contact** Two hours per week for one semester comprising one hour of lectures and one hour of tutorial/laboratory sessions.

**Assessment** End of semester examination 80%, assignment/test 20%.

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**SMA2311 MATHEMATICS 2P**

**Campus** Footscray Park

**Prerequisite(s)** SMA1321 Mathematics 1Q.


**Class Contact** Four hours per week for one semester comprising lecture and tutorial work.

**Assessment** End-of-semester examination, 100%.

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**SMA2321 MATHEMATICS 2Q**

**Campus** Footscray Park

**Prerequisite(s)** SMA2311 Mathematics 2P.


**Required Reading** To be advised by lecturer.

**Class Contact** Four hours per week for one semester comprising lecture and tutorial work.

**Assessment** End-of-semester examination, 100%.

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**SMA3361 INTRODUCTION TO RESEARCH METHODOLOGY**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** Fundamental concepts of statistics. Basic statistical calculations. Introduction to research methodology.

**Required Reading** Hicks, C., *Research and Statistics*.

**Class Contact** Thirteen hours of lectures, tutorial and laboratory work during one semester.

**Assessment** Assignments, 20%; end-of-semester examination, 80%.

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**SMA3311 MATHEMATICS 3P**

**Campus** Footscray Park

**Prerequisite(s)** SMA2311 Mathematics 2P or SMA2211 Engineering Mathematics.

**Content** Functions defined by integrals – differentiation of gamma and beta functions. Second order linear differential equations – reduction of order, variation of parameters, Eulers equation, series solutions, Bessel equation, Bessel functions. Partial differential equations – Laplaces equation, the wave and heat equations, separation of variables in Cartesian and polar coordinates. Iteration – fixed point iteration, convergence/divergence, convergence rate, the logistic equation, bifurcation, chaos, the Mandelbrot set, Julia sets, Newton-Raphson iteration, basins of attraction, visualisation using computer graphics.


**Class Contact** Four hours per week for one semester comprising lecture and tutorial work.

**Assessment** End of semester examination, 90%; computer graphics assignment, 10%.

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**SMA4201 MATHEMATICS**

**Campus** Footscray Park

**Prerequisite(s)** SMA2211 Engineering Mathematics; SMA2231 Mathematics or equivalent.

**Content** Laplace Transforms: revision of the Heaviside unit-step function and the second shifting theorem; transforms of impulsive and periodic functions; initial-value and final-value theorems; transfer functions. Matrices: matrix representations, e.g. of a graph, of a transformation; linear dependence/independence of a set of vectors; eigenvalues and eigenvectors of a matrix. Stability of an autonomous system of ordinary differential equations (bief treatment). Numerical methods: solution of an equation using iterative methods with
special reference to the Newton-Raphson method; convergence and rate of convergence of iterations; Gaussian elimination and iterative solution of a system of linear equations; numerical integration using the trapezoidal rule, Simpson's rule, Newton-Cotes formulae; analysis of errors in numerical integration; numericals solution of equations of the form \( y = f(x,y) \) using Euler's method and the Runge-Kutta method (second-order and fourth-order processes). Computer applications using MATLAB to be based on a selection of the above topics.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester comprising lectures, tutorials and laboratory work.

**Assessment** End-of-semester examination, 70%; assignments and laboratory work, 30%.

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**SPH 1010 PHYSICS 1**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Co-requisite(s)** SMA1201 and/or SMA1202.

**Content** Semester one: SPH1011 Mechanics 1A; SPH1021 Waves, Sound and Optics; SPH1091 Physics Laboratory 1A. Semester two: SPH1012 Mechanics 1B; SPH1022 Electricity, Magnetism and Modern Physics; SPH1102 Physics Laboratory 1B.


**Class Contact** 65 hours of lectures/tutorials each semester, 26 hours of laboratory experiences in each semester.

**Assessment** End-of-semester examinations plus tests during the semester. Performance in experiments. End of semester laboratory test. Supplementary assessment will be granted at the discretion of the examination board.

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**SPH 1011 MECHANICS 1A**

**Campus** Footscray Park

**Prerequisite(s)** Nil.


**Class Contact** 20 hours of lectures/6 hours of tutorials.

**Assessment** End-of-semester examination, 80%; tests during the semester, 20%. Supplementary assessment will be granted at the discretion of the examination board.

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**SPH 1021 WAVES, SOUND AND OPTICS**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** Analytical representation of waves, wave energy and intensity, velocity of various mechanical waves, superposition of waves, Doppler effect. Acoustic waves, pressure and displacement, intensity and loudness, the decibel. Spherical mirrors, lenses, ray tracing, thin lens and mirror formulæ for image position, lateral magnification. Wave nature of light, interference and diffraction, resolving power. Polarisation.


**Class Contact** 32 hours of lectures/7 hours of tutorials.

**Assessment** End-of-semester examination, 80%; tests during the semester, 20%. Supplementary assessment will be granted at the discretion of the examination board.

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**SPH 1022 ELECTRICITY, MAGNETISM AND MODERN PHYSICS**

**Campus** Footscray Park

**Prerequisite(s)** Nil.


**Class Contact** 32 hours of lectures/7 hours of tutorials.

**Assessment** End-of-semester examination, 80%; tests during the semester, 20%. Supplementary assessment will be granted at the discretion of the examination board.
SPH 1091 PHYSICS LABORATORY 1A
Campus Footscray Park
Prerequisite(s) Nil.
Content A series of graded laboratory exercises designed to support and enhance the students’ understanding of physics through hands on experience of physical measurement and the limitations thereof.
Required Reading Physics Laboratory 1A Manual, Victoria University.
Recommended Reading Serway, R. and Beichner, R., 2000, Physics for Scientists and Engineers with Modern Physics, 5th edn, Saunders College Publishing.
Class Contact 26 hours of laboratory experiments.
Assessment Performance in experiments, 60%; end-of-semester laboratory test, 40%. Supplementary assessment will be granted at the discretion of the examination board.

SPH 1092 PHYSICS LABORATORY 1B
Campus Footscray Park
Prerequisite(s) Nil.
Content A series of graded laboratory exercises designed to support and enhance the students’ understanding of physics through hands on experience of physical measurement and the limitations thereof.
Required Reading Physics Laboratory 1B Manual, Victoria University.
Recommended Reading Serway, R. and Beichner, R., 2000, Physics for Scientists and Engineers with Modern Physics, 5th edn, Saunders College Publishing.
Class Contact 26 hours of laboratory experiments.
Assessment Performance in experiments, 60%; end-of-semester laboratory test, 40%. Supplementary assessment will be granted at the discretion of the examination board.

SPH 1100 ELECTRONICS 1
Campus Footscray Park
Prerequisite(s) Nil.
Content Semester one: SPH1101 Electronics 1A. Semester two: SPH1102 Electronics 1B.
Class Contact 26 hours of lectures/tutorials in each semester. 26 hours of laboratory experiments in each semester.
Assessment End-of-semester three-hour examination, plus tutorial test(s), 80%; laboratory work, 20%. Students are expected to pass both the theory and laboratory components in order to gain a pass.

SPH 1101 ELECTRONICS 1A
Campus Footscray Park
Prerequisite(s) Nil.
Content Digital Electronics: Number systems, number bases and conversions, binary arithmetic, complements, binary codes, binary logic, logic gates, Boolean algebra, logic theorems, Karnaugh maps, logic circuits. Combinational logic circuits, adders, encoders and decoders, code converters, multiplexers and demultiplexers, comparators. Sequential logic circuits, flip flops (RS, JK, D, T), counters, registers. Characteristics of various logic types (TTL, CMOS, ECL). ROM and RAM. Programmable logic devices, eg PLAs. Timing and control, monostable vibrators, Schmitt trigger, integrated circuit timer and applications.
Class Contact 26 hours of lectures/tutorials. 26 hours of laboratory experiments.
Assessment End-of semester three-hour examination, plus tutorial test(s), 80%; laboratory work, 20%. Students are expected to pass both the theory and laboratory components in order to gain a pass.

SPH 1111 ASTRONOMY
Campus Footscray Park
Prerequisite(s) Nil.
Content History of astronomy, telescopes, our sun, solar system, comets, meteors, the night sky, stellar evolution and spectra,
variable stars, distances of celestial objects, galaxies (pulsars, black holes and quasars).

**Required Reading** To be advised by lecturer.


**Class Contact** Four hours per week for one semester.

**Assessment** will be based on practical sessions, an assignment and an end of semester examination. Supplementary assessment will only be available if requested by the school/department governing the course in which the student is enrolled.

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**SPH 1210 PHYSICS 1F**

**Campus** St Albans, Werribee.

**Prerequisite(s)** Year 12 Physics or equivalent is recommended.

**Content** The aim of this subject is to provide an introduction to some basic principles and techniques of physics. A selection of topics from the following will be studied: units; mechanics; thermal physics; fluid dynamics; electromagnetism; electronics.


**Class Contact** Four hours per week for one semester comprising lectures, tutorials and practical work.

**Assessment** Assignments, 20%; practical work, 20%; examination/tests, 60%. Supplementary assessment will only be available if requested by the school/department governing the course in which the student is enrolled.

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**SPH 1220 PHYSICS 2F**

**Campus** St Albans, Werribee.

**Prerequisite(s)** Year 12 Physics or equivalent is recommended.

**Content** The subject aims to provide an introduction to some basic principles and techniques of physics. A selection of topics from the following will be studied: waves and sound; light and optics; electricity; modern physics, mechanics.


**Class Contact** Four hours per week for one semester comprising lectures, tutorials and practical work.

**Assessment** Assignments, 20%; practical work, 20%; examination/tests, 60%. Supplementary assessment will only be available if requested by the school/department governing the course in which the student is enrolled.

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**SPH 1601 PHYSICS 1SA**

**Campus** Footscray Park, Werribee.

**Prerequisite(s)** Nil.

**Content** *Physical Units and Dimensions*: physical quantities; systems of units; standards; dimensions; uses of dimensions; dimensional analysis; order of magnitude calculations; significant figures.  
*Kinematics*: vectors and scalars, displacement, velocity; acceleration; equations of uniformly accelerated motion in one and more dimensions; average and instantaneous velocity and acceleration.  
*Dynamics*: Concept of momentum and force; Newton’s laws of motion; friction; applications of Newton’s laws in one dimension; motion in a circle; work done by a force, kinetic and potential energy; conservation of energy and momentum.  
*Fluids*: Density; fluid pressure; variation of pressure with depth Pascal’s law.


**Class Contact** 39 hours over one semester comprising 2 hours lecture/tutorial/demonstration and 1 hour small group tutorial per week.

**Assessment** End of semester examinations, 60%; progressive assessment, 40%. Supplementary assessment will only be available if requested by the school/department governing the course in which the student is enrolled.

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**SPH 1602 PHYSICS 1SB**

**Campus** Footscray Park, Werribee.

**Prerequisite(s)** SPH1601 Physics 1SA.

**Content** *Electricity and Magnetism*: Concept of charge, electric field and electric potential; Coulomb’s law; electric field lines; electric flux; Gauss’ law; capacitance and dielectrics; force on current carrying conductors; concept of magnetic field intensity; Lorentz force; magnetic field lines; magnetic flux; Faraday’s law; induced emf; inducement.

*Waves*: Wave motion; frequency, period, amplitude and wavelength; waves in strings; moduli of elasticity; sound waves in media; pressure variation; intensity of a wave; sound level; dB scale; variation of intensity with distance from source; Doppler effect; superposition of waves; interference; standing waves; beats.  
*Thermal Physics*: Concept of temperature and heat energy; thermal expansion of solids and liquids; heat transfer; heat capacity and specific heat; latent heat; ideal gases; work and heat in thermodynamic processes; isothermal and adiabatic processes; first law of thermodynamics; heat engines and the second law of thermodynamics.


**Class Contact** 39 hours over one semester comprising 2 hours lecture/tutorial/demonstration and 1 hour small group tutorial per week.

**Assessment** End of semester examinations, 60%; progressive assessment, 40%. Supplementary assessment will only be available if requested by the school/department governing the course in which the student is enrolled.

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**SPH 2000 PHYSICS 2**

**Campus** Footscray Park

**Prerequisite(s)** SPH1010 or its equivalent, SMA1201

**Corequisite(s)** SMA1202 &/or SMA2311

**Content**  

**Required Reading** See references under each unit

**Recommended Reading** See references under each unit

**Class Contact** 114 hours per semester, comprising lectures, tutorials and laboratory sessions. Supplementary assessment will be granted at the discretion of the examination board.

**Assessment** End of semester examinations plus assignments. Performance in experiments, written reports and oral presentations. The marks in each unit will be weighted by its credit point value and these will be summed and scaled out of 100. A final mark of at least 50 is required to pass. Supplementary assessment will be granted at the discretion of the examination board.
Measurement Systems

Required Reading
- Closed loop systems, examples.
- Characteristics of measurement systems, control theory, open and measurements, signal-to-noise, noise sources, filtering and noise reduction.

FACULTY OF ENGINEERING AND SCIENCE

SPH2011 QUANTUM MECHANICS

Campus Footscray Park
Prerequisite(s) a minimum of SPH1011, SPH1022, SMA1201
Corequisite(s) SMA1202 &/or SMA2311


Class Contact 26 hours lectures/tutorials
Assessment End of semester two-hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will be granted at the discretion of the examination board.

SPH2012 ELECTROMAGNETIC THEORY

Campus Footscray Park
Prerequisite(s) SPH1021, SPH1022 & SMA2311
Corequisite(s) Nil
Content Revision of Maxwell's equations in integral form, potential gradient, del notation in Cartesian, cylindrical and spherical co-ordinates, divergence of E and B, Poisson and Laplace equations – method of images, curl of E and B, Maxwell equations in differential form, implications of changing electric field term, an electromagnetic wave in free space and in conducting media, energy transfer – Poynting vector, boundary conditions and media, energy transfer down a cable, radiation from an accelerated charge, laws of optics.


Class Contact 26 hours of lectures/tutorials
Assessment End of semester two-hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will be granted at the discretion of the examination board.

SPH2021 INSTRUMENTATION & AC THEORY

Campus Footscray Park
Prerequisite(s) SPH1021 & SMA1201
Corequisite(s) SPH1100
Content Complex numbers in AC theory, phasor notation, Fourier/spectral analysis, complex impedance & power, analysis of response of RLC circuits as an example of a second order system, resonance, corollaries, mesh current and node voltage analysis, Thévenin and Norton theorems. Quality of measurements, signal-to-noise, noise sources, filtering and noise reduction, frequency response and bandwidth, dynamic characteristics of measurement systems, control theory, open and closed loop systems, examples.

Required Reading To be advised by lecturer.

Class Contact 26 hours of lectures/tutorials
Assessment End of semester two-hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will be granted at the discretion of the examination board.

SPH2022 OPTICS & RELATIVITY

Campus Footscray Park
Prerequisite(s) SPH1011, SPH1012 & SPH1021
Corequisite(s) SMA2311
Content Optics – Lens systems: thick lens design using matrix methods, aberrations. Multiple beam interference: Fresnel equations, complex reflection and transmission coefficients, reflectance instrument function for the plane parallel optical resonant cavity, instrument parameters for optical cavities, applications as Fabry-Perot interferometer, interference filters and laser cavities, tuning. Multi-layer coating design. Lasers: Stimulated emission, population inversion, Einstein coefficients, energy level diagrams, various types of lasers and their operation, mode structure, laser applications. Relativity – Conceptual basis of special relativity, length and time dilation, momentum, mass and energy; Introduction to conceptual basis and important results of general relativity.


Class Contact 26 hours of lectures/tutorials
Assessment End of semester two-hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will be granted at the discretion of the examination board.

SPH2031 KINETIC THEORY AND THERMODYNAMICS

Campus Footscray Park
Prerequisite(s) SPH1011 & SMA1201
Corequisite(s) Nil
Content Kinetic Theory: Microscopic and macroscopic definitions of an ideal gas, kinetic calculation of pressure, kinetic interpretation of temperature, internal energy of an ideal gas, equipartition of energy, specific heats of ideal gases, mean free path, distribution of molecular speeds. Thermodynamics: Zeroth law of thermodynamics, thermometry, International Practical Temperature Scale, revision of first and second laws of thermodynamics, entropy, heat engines and refrigerators, practical examples of these devices, Gibb's function, enthalpy, Helmholtz free energy, the Maxwell equations, first and second TDS equations, the energy equation, applications of thermodynamics to physical processes and devices apart from purely gaseous systems) including: magnetisation and adiabatic demagnetisation of paramagnetic materials, polarisation of dielectrics, the electro-chemical cell, the fuel cell, thermoelectricity and the Peltier and Thompson effects, thermoelectric refrigeration.
SPH2032 SOLID STATE AND NUCLEAR PHYSICS

Campus Footscray Park
Prerequisite(s) SPH1022, SMA1202
Corequisite(s) Nil

Content Crystal lattices and structures, Lattice planes and directions; Diffraction laws in Bragg and von Laue forms, reciprocal lattice, structure factor; Classical and quantum free electron theories of metals, Band theory of solids. Observed properties of nuclei, nuclear models, nuclear decay, radiation. Elementary particles – the standard model. Examples and experimental techniques in these fields.


Class Contact 26 hours lectures/tutorials
Assessment End of semester two-hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will be granted at the discretion of the examination board.

SPH2091 PHYSICS LABORATORY 2A

Campus Footscray Park
Prerequisite(s) SPH1010 or at least 4 units of 1st year physics units including SPH1091 & SPH1092
Content A series of graded laboratory exercises designed to support and enhance the students’ understanding of physics through hands on experience of physical measurement and the limitations thereof.

Required Reading Physics Laboratory 2A Manual. Victoria University.

Class Contact 36 hours of laboratory experiences
Assessment Logbook of experimental work 50%, formal reports 25% and oral presentations 25%. Supplementary assessment will be granted at the discretion of the examination board.

SPH2092 PHYSICS LABORATORY 2B

Campus Footscray Park
Prerequisite(s) SPH1091
Corequisite(s) Nil

Content A series of graded laboratory exercises designed to support and enhance the students’ understanding of physics through hands on experience of physical measurement and the limitations thereof.


Class Contact 36 hours of laboratory experiences

Assessment Logbook of experimental work 50%, formal reports 25% and oral presentations 25%. Supplementary assessment will be granted at the discretion of the examination board.

SPH2432 DATA ACQUISITION AND INTERFACING

Campus Footscray Park
Prerequisite(s) SPH1101 Physics 1, SPH1100 Electronics 1 and SCM1111 Introduction to Computer Systems 1.

Content The subject aims to: give students a thorough understanding of experimental data handling techniques; teach modern, computer-based laboratory instrumentation with an emphasis on practical techniques. Experimental data handling: Units and dimensions, measurements and errors, types of errors, combining errors in multivariate functions, statistical distributions, linear regression, sensors and transducers: generalised measurement system. Transducers. Transducer types, e.g. resistive, voltage, current, capacitive, inductive. Transducer circuits, e.g. bridges and operational amplifiers. Computer laboratory interfacing: Analogue to digital conversion: Data acquisition, time varying signals and the sampling theorem. Digital to analogue conversion: Generation of DC and AC voltages. Adaptive computer control: Open-loop system response, performance criteria. Control types, hysteresis. Digital input and output. GPIB: description and overview.


Class Contact Four hours per week for one semester comprising two one-hour lectures and two hours laboratory work.

Assessment End-of-semester three-hour examination, 65%; laboratory work (including a project), 35%. Students are expected to pass both the theory and laboratory components in order to gain a pass in this subject. Supplementary assessment will be granted at the discretion of the examination board.

SPH3000 PHYSICS 3

Campus Footscray Park
Prerequisite(s) SPH2000 or its equivalent, SMA2311
Corequisite(s) SMA2321 or SMA3311

Content Semester 1: SPH3011 Classical Mechanics, SPH3021 Optics 3, SPH3031 Fibre Optics, SPH3091 Physics Laboratory 3A. Semester 2: SPH3012 Quantum Mechanics, SPH3022 Laser Physics, SPH3032 Atomic Physics & Atomic Spectroscopy, SPH3092 Physics Laboratory 3B

Required Reading See references under each unit

Recommended Reading See references under each unit

Class Contact 118 hours per semester, comprising lectures, tutorials and laboratory sessions.

Assessment End of semester examinations. The marks in each unit will be weighted by its credit point value and these will be summed and scaled out of 100. A final mark of at least 50 is required to pass. Supplementary assessment will be granted at the discretion of the examination board.
SPH3011 CLASSICAL MECHANICS

Campus Footscray Park
Prerequisite(s) SPH1010 or its equivalent, SMA2311.
Corequisite(s) SMA2321 and/or SMA3311

Required Reading Chow, T.L., Classical Mechanics, J. Wiley and Sons.
Recommended Reading To be advised.
Class Contact 26 hours per semester, comprising 20 lectures and 6 tutorials.
Assessment End of semester examination, 100%.
Supplementary assessment will be granted at the discretion of the examination board.

SPH302 Q UANTUM MECHANICS

Campus Footscray Park
Prerequisite(s) SPH2011 or its equivalent, SMA3311
Content Perturbation theory, Einstein A & B coefficients, interaction of radiation field with atoms. Introduction to Dirac Bra-ket notation, scattering.

Required Reading Mandl, F., 1992, Quantum Mechanics, Wiley, Chichester UK.
Class Contact 26 hours per semester, comprising 20 lectures and 6 tutorials.
Assessment End of semester examination 100%. Supplementary assessment will be granted at the discretion of the examination board.

SPH3021 OPTICS 3

Campus Footscray Park
Prerequisite(s) At least SPH2022 or its equivalent, SMA2311

Class Contact 26 hours per semester, comprising 20 lectures and 6 tutorials.
Assessment End of semester examination, 100%. Supplementary assessment will be granted at the discretion of the examination board.

SPH3022 LASERS

Campus Footscray Park
Prerequisite(s) SPH2000 or its equivalent, SMA2311
Corequisite(s) SMA2321

Required Reading To be advised.
Class Contact 26 hours per semester, comprising 20 lectures and 6 tutorials.
Assessment End of semester examination, 100%. Supplementary assessment will be granted at the discretion of the examination board.

SPH3031 FIBRE OPTICS

Campus Footscray Park
Prerequisite(s) At least SPH2022 or its equivalent, SMA2311
Corequisite(s) SMA2321 and/or SMA3311

Required Reading To be advised.
Class Contact 26 hours per semester, comprising 20 lectures and 6 tutorials.
Assessment End of semester examination, 100%. Supplementary assessment will be granted at the discretion of the examination board.
SPH3032 ATOMIC PHYSICS AND ATOMIC SPECTROSCOPY

Campus Footscray Park
Prerequisites SPH2000 or its equivalent, SMA2311

Required Reading To be advised.
Class Contact 26 hours per semester, comprising 20 lectures and 6 tutorials.
Assessment End of semester examination, 100%.
Supplementary assessment will be granted at the discretion of the examination board.

SPH3091 PHYSICS LABORATORY 3A

Campus Footscray Park
Prerequisite(s) SPH2000 or at least 4 units of 2nd year physics units including SPH2091, SPH2092 and SPH2432
Content A series of graded laboratory exercises designed to support and enhance the students’ understanding of physics through hands on experience of physical measurement and the limitations thereof.

Required Reading Physics Laboratory 3A Manual. Victoria University.
Class Contact 40 hours of laboratory experiences.
Assessment Based on student performance in the laboratory exercises and on a series of formal reports. Supplementary assessment will be granted at the discretion of the examination board.

SPH3092 PHYSICS LABORATORY 3B

Campus Footscray Park
Prerequisite(s) SPH3091, SPH2432
Content A series of graded laboratory exercises designed to support and enhance the students’ understanding of physics through hands on experience of physical measurement and the limitations thereof.

Required Reading Physics Laboratory 3B Manual. Victoria University.
Recommended Reading Nil
Class Contact 40 hours of laboratory experiences.
Assessment Based on student performance in the laboratory exercises and on a series of formal reports. Supplementary assessment will be granted at the discretion of the examination board.

SPH3100 PHYSICS 3O

Campus Footscray Park

SPH3200 OPTOELECTRONICS 3

Campus Footscray Park
Prerequisite(s) SPH2000 or its equivalent, SMA2311
Corequisite(s) SMA2321, SMA3311, SPH3021, SPH3031
Content Semester 1; SPH301 Classical Mechanics, SPH3021 Optics 3, SPH3031 Fibre Optics, SPH3091 Physics Laboratory 3A. Semester 2; SPH3012 Quantum Mechanics, SPH3022 Lasers, SPH3032 Atomic Physics & Atomic Spectroscopy.
Required Reading See references under each unit.
Recommended Reading See references under each unit.
Class Contact 118 hours in semester 1, comprising lectures, tutorials and laboratory sessions. 78 hours in semester 2, comprising lectures and tutorials.
Assessment End of semester examinations. The marks in each unit will be weighted by its credit point value and these will be summed and scaled out of 100. A final mark of at least 50 is required to pass. Supplementary assessment will be granted at the discretion of the examination board.

SPH3430 PHYSICS PROJECT

Campus Footscray Park
Prerequisite(s) SPH2000 or at least 4 units of 2nd year physics units including SPH2091 and SPH2092
Content The aim of the Physics project is to develop in students the ability to approach an investigative problem in a logical and sensible way, and to develop the ability to carry out and report on a small research or development task. Students will spend an average of three hours per week throughout the semester working independently on their allocated project under the supervision of a member of the academic staff.
Required Reading To be advised by the lecturer.
Recommended Reading Nil
Class Contact No formal classes are held. Students will be required to work on their projects systematically throughout the semester at times suitable to themselves and their supervisor.
Assessment The assessment is made on the basis of the student performance in the seminar organised by the supervisor and the quality of the written reports(s).

SPH3441 OPTICAL PROPERTIES OF MATERIALS

Campus Footscray Park
Prerequisite(s) SPH2000 Physics 2, SMA2311
Co-requisite(s) SPH3100 Physics 3O, SMA2321 or SMA3311
Content The aim of this subject is to acquaint students with the principles governing the use, suitability and applications of materials for various optical applications. In each category, currently-used materials will be extensively reviewed. General Properties Propagation of E/M waves in dielectric media; models of the refractive index; dispersion, absorption and the refractive index; frequency dependence; scattering; cross-sections. Properties of Lens Materials Commonly used materials in the ultra-violet, visible and infrared regions; transmittance, dispersion and the refractive index; environmental properties; examples. Solid State Laser Materials Host materials: crystalline materials, semiconductors, active ions; colour centres. Non-linear Materials Electro-optic effect; magneto-optic effect. Thin Film Materials Substrates. Optical damage mechanisms; self-focusing; damage thresholds; specification of cosmetic surface quality of optical components.


Class Contact Two hours per week for one semester, comprising two one-hour lectures.

Assessment Semester tests and/or assignments, 50%; end of semester examination or major report, 50%. Students are expected to pass each component of the assessment to gain a pass in this subject. Supplementary assessment will not normally be available in this subject.

SPH3451 ADVANCED OPTICS AND OPTICAL DESIGN

Campus Footscray Park

Prerequisite(s) SPH2000 Physics 2, SMA2311


Assessment Two hours per week for one semester comprising one one-hour lecture and one one-hour tutorial/labatory class.

SPH3462 OPTICAL WAVEGUIDES AND SENSORS

Campus Footscray Park

Prerequisite(s) SPH3021 Optics 3 and SPH3031 Fibre Optics, SMA2311

Corequisite(s) SMA2321 or SMA3311.

Content The aim of this subject is to develop the theory of optical fibre waveguides using a rigorous wave treatment of the propagation of light, and then to use this theory in understanding the operation of optical fibre sensors and components. Optical Waveguide Theory: Maxwell's Equations for waveguides, boundary conditions and eigenvalue equations, planar dielectric waveguides and their modes, cylindrical dielectric waveguides and their modes, LP mode description, Gaussian approximation, dispersion in multimode and single mode fibres, normal mode theory of single mode fibre couplers. Optical Fibre Sensors: Introduction and basic concepts, materials interactions in optical fibre sensors, fibre optic components, special optical fibres for sensors, interferometric sensors, fibre-optic gyroscope, intensity and wavelength-based sensors, multiplexed and distributed sensors, applications of fibre sensors, e.g. smart structures.

Required Reading To be advised by lecturer.


Class Contact Two hours per week for one semester comprising two one-hour lectures.

Assessment End-of-semester examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will be granted at the discretion of the examination board.

SPH3472 TECHNICAL PROJECT

Campus Footscray Park

Prerequisite(s) Completed second year of the course plus satisfactory progress in semester one of third year.

Content The aim of this subject is to develop in students the ability to approach an investigative or developmental problem in a logical manner. Students will be placed in an industrial, government or university facility to carry out individual projects in the optical engineering field.

Required Reading Nil.
Class Contact: No formal classes are held. Students are required to work on their projects for the equivalent of two full days per week for one semester (approximately 11 hours per week).

Assessment: is made by a committee of the academic staff taking into account the student's performance in the following: written project proposal; written and oral progress report; final written and oral report. The final written report is assessed primarily by the project supervisor. Supplementary assessment will not normally be available in this subject.

SPH3941 COMPUTATIONAL PHYSICS A

Prerequisite(s): SCM1311 Programming 1 and SCM1312 Programming 2

Corequisite(s): Nil.

Content: The programming language normally used will be FORTRAN. The fundamentals of the FORTRAN language will be presented including the following features: fortran statements, data types and constants, arithmetic and character expressions, assignment and control statements, arrays, loops, formatting printed data, structured modular programming, subroutine and function calls, parameter passing, control structures, data structures, file types, file operation, file I/O formatting. Assignments will normally cover topics such as: roots of non-linear equations, solution of simultaneous linear algebraic equations, eigenvalues and eigenvectors, differentiation and integration, solution of differential equations, discrete function approximation, non-linear regression, fast Fourier transforms, digital filtering, simulation.

Required Reading: To be advised.


Class Contact: 39 hours of lectures/tutorials.

Assessment: End of semester examination 50%, assignments 50%. Supplementary examination will be granted at the discretion of the examination board.

SPH3942 COMPUTATIONAL PHYSICS B

Prerequisite(s): Nil.

Content: This course introduces students to advanced computational tools for solving physical problems. A modern computer algebra package (currently Maple) is used as an aid in solving a range of problems which arise in physics. Typical problems include: solution of rate equations for lasing materials; the dynamics of coupled pendula; solution of Schrödinger equation for selected potentials, least squares fitting of non linear functions to data.

Required Reading: To be advised.


Class Contact: 39 hours of lectures/tutorials.

Assessment: End of semester examination 50%, assignments 50%. Supplementary examination will be granted at the discretion of the examination board.

SPH 4410 PHYSICS 4 (HONOURS)

Campus: Footscray Park

Prerequisite(s): Eligibility for entry to the Bachelor of Science (Honours) in Physics program.

Content: This subject consists of advanced coursework and a research thesis.

Coursework: Compulsory core units of quantum mechanics, statistical mechanics and research methods, plus elective units from the following areas: optical waveguides and sensors, relativity, surface physics, ion beam techniques, optics of materials, laser physics, lasers and optoelectronics, fibre optics, solid state physics, diffraction from crystals, nuclear physics. Other electives may be approved, including those offered at other universities. All electives must be approved by the Course Coordinator.

Research Thesis: A research project will be undertaken in one of the Physics research areas, under the supervision of a member of academic staff. Subject to approval, research may be undertaken at a laboratory outside the University.


Class Contact: Average of 20 hours per week for two semesters.

Assessment: based on coursework, 50%; research thesis, 50%. The research project will consist of oral presentation and a thesis of approximately 5000–10,000 words.

SPH 4531 FIBRE OPTIC TECHNOLOGY

FUNDAMENTALS

Campus: Footscray Park

Prerequisite(s): Nil.

Content: This subject provides a first course in the practical and theoretical aspects of optical fibre systems and devices for electrical engineering students. This subject aims to give students an understanding of the fundamentals of optical fibre communications and sensor technology, and an appreciation of the practical aspects of optical fibre communications and sensing systems. Topics covered: Review of basic optical theory. Types of optical fibres. Attenuation in silica optical fibres. Modes in slab waveguides. Modes and distortion in optical fibres. Sources and detectors for fibre optic systems. Noise in detector systems. Fibre optic communications systems. Fibre optic sensors. Optical fibre fabrication. Practical program. Several small demonstrations to give students practical experience in handling fibres and fibre equipment.


Class Contact: Three hours per week for one semester comprising lectures, tutorials and laboratory work.

Assessment: End of semester three-hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will only be available if requested by school/department governing the course in which the student is enrolled.
Postgraduate Studies

Food Safety, Authenticity and Quality Unit

This unit has been established in recognition of existing research work in the field of food quality within the Faculty and to develop active partnerships with institutions and individuals locally, nationally and internationally in the areas of safety and authenticity. Much of the facilities and support from the Centre for Bioprocessing and Food Technology have been transferred into the Unit providing both oversight and continuity for students and projects.

Preliminary discussions with a number of resident institutions on the Werribee Technology Precinct have promised support and collaboration in areas of mutual interest which it is expected will also provide expert teaching into appropriate courses with the Faculty. There is additional potential interaction with the Australian Government Analytical Laboratories (AGAL) given their increasing interests in the food area.

Australian Food Marketing Centre

The Australian Food Marketing Centre was established in 1991 through a grant from the Commonwealth Department of Primary Industry and Energy with the objective of developing food trade and investment between Australia and Japan. Following a review of its operations in 1993 by the University, it was decided that the Centre would primarily focus on applied and strategic research programs, provide consultancy and education programs in areas such as food marketing, management of food business and food industry policy. As a result of the new directions, by 1997 the Centre became a leading provider of R&D services to all sectors (producers, processors, R&D corporations, government departments, industry associations, resellers, etc.) of the food industry in Australia.

Research and Consultancy Projects

Current research programs cover the following themes:
- Introduction of new crops, industries and agricultural systems
- Integration and strategic partnerships across the food value chain, supply chain and demand chain.
- Food trade and investment strategies and trends
- Food industry trends and performance
- Food business development and growth strategies
- Food public policy and trade issues
- Business-to-business relationship and transaction based exchanges
- Innovation and change in the food industry
- Customer satisfaction and business performance

Conferences and Training Programs

The Centre delivers conferences, seminars, workshops and training programs for Australian and overseas organisations. In the last five years more than 100 senior corporate executives, government officials, representatives e of trade associations and overseas researchers have participated in various events organised by the Centre.

Information Services

The Centre publishes a fortnightly bulletin, Food Information Briefs, delivers briefing programs on food industry issues, maintains a comprehensive database of food companies in Australia and conducts periodical review and analysis of different food industry sectors.

Centre for Environmental Safety and Risk Engineering

Courses Offered

The Centre for Environmental Safety and Risk Engineering offers postgraduate courses leading to the award of:
- Doctor of Philosophy
- Master of Engineering (Research)
- Master of Engineering in Building Fire Safety and Risk Engineering (Coursework)
- Master of Science in Occupational Safety and Health
- Master of Science in Occupational Hygiene
- Graduate Diploma in Building Fire Safety and Risk Engineering
- Graduate Certificate in Performance-Based Building and Fire Codes

International Programs

Offshore Programs conducted in Hong Kong (in conjunction with the Chinese University of Hong Kong):
- Master of Engineering in Building Fire Safety and Risk Engineering (Coursework)
- Graduate Diploma in Building Fire Safety and Risk Engineering
- Graduate Certificate in Performance-Based Building and Fire Codes

Focus

The Centre for Environmental Safety and Risk Engineering was established as the inaugural University Centre in July 1991 to undertake multi-disciplinary research and graduate programs. The mission of the Centre is to provide national and international leadership for the conduct of studies which will lead to the implementation of efficient designs for hazardous infrastructure facilities and to ensure that the impact on people, property and the environment is minimised to acceptable levels.

Examples of hazards which are and will be investigated by the Centre include:
- Fire in Buildings
- Hazardous Industrial Complexes: Fire, Explosion, and -Release of Hazardous Substances
- Transport of and Storage of Hazardous Goods.

The work of the Centre in building fire safety and protection systems is internationally recognised.

The Centre undertakes the following multi-disciplinary activities:
- Applied Research
- Specialist Consulting
- Research at PhD and Masters levels
- Graduate Diploma course
- Masters by Coursework and Minor Thesis
- Graduate Certificate course
- Short Courses, Seminars and Workshops.
Current Research
Research by the Centre into building fire safety and protection is conducted in a number of areas:

- System Modelling and Risk assessment (Core Research)
- Fire Growth and Spread/Smoke Spread
- Response of Building Subsystems to Fire
- Human Behaviour in Fire
- Building Fire Safety Systems Analysis
- Decision-support for Emergency Management
- Risk Communication

Recent Research Grants
The Centre for Environmental Safety and Risk Engineering (CESARE), Victoria University, in conjunction with the University of Technology, Sydney, initially received a major Australian Research Grant (1991/93) to construct an Experimental Building – Fire Facility. This grant was supplemented by substantial additional ARC Infrastructure Grants to CESARE to further develop the Facility. These grants were complemented by extensive design, supervision, technical and material input from key organisations involved in the fire safety and protection industry. The value of the Facility is some $1.5 million.

The Centre has been very successful in attracting research funds from various bodies, including competitive Australian Research Council (ARC) Grants. Grants obtained include: two ARC Large Grants, ARC Collaborative Research Grant (with BHP and the National Association of Forest Industries, NAFI), ARC Infrastructure Grant, industry grants, contracts and scholarships (for example, from BHP and NAFI), research contracts from the National Fire Laboratory, National Research Council of Canada (on behalf of the Department of National Defence, Canada, and Public Works Canada). The annual research budget for the Centre is some $1m.

In 1999 the Centre obtained an Australian Research Council Research Equipment and Facilities Infrastructure Grant to install a new Fire Research Furnace. The furnace is used to conduct research on the performance of elements of construction under fire conditions. The furnace is located at the Centre's new laboratory and office complex at the Werribee campus. A cone calorimeter has also been installed at the Werribee Campus.

Experimental Building - Fire Facility
An Experimental Building – Fire Facility is used to conduct real fire experiments in realistic prototype buildings. Extensive instrumentation is used to record the growth and spread of fires and the effects of fire in the Facility.

The results from these experiments are used to develop and validate advanced computer models for predicting fire growth and spread in buildings, the response of building subsystems to fire, and human behaviour during fire emergencies.

The $1.5m Facility contains a large versatile building based on a steel frame and composite floor-slab structure, a service core containing stair, life and air handling shafts, together with associated services including sprinklers.

The open structure and high inter-floor space permits fitouts of a variety of prototype building occupancies and construction types.

A separate building provides storage, office instrumentation and workshop facilities.

The Facility is located at the Country Fire Authority Training Wing at Fiskville, some 90km west of Melbourne.

Collaboration with Industry
The Centre undertakes collaborative research and development projects with key industry and government organisations, including:

- BHP Research – Melbourne Laboratories
- CSIRO
- Scientific Services Laboratory, Commonwealth Department of Administrative Services

For example, the Centre has been appointed as the major research provider to the Fire Code Reform Centre Ltd (FCRC) that is undertaking a multi-million dollar reform program of Australian building and fire codes. FCRC was established with funding provided by Australian Governments, via the Australian Building Codes Board, and industry. Other research providers to FCRC include BHP, CSIRO and SSL.

The Centre undertakes collaborative research and development projects, and promotes the practice of fire safety engineering by technology transfer programs via workshops and short courses. The Centre provides a forum where industry and government organisations can interact with the University.

For example, the Centre in conjunction with the Building Control Commission, Victoria introduced a new Graduate Certificate in Performance-Based Building and Fire Codes to support the introduction of the Performance-based Building Code of Australia.

In 1999 the BHP Fire and Construction Research Unit, with five staff, relocated to the Werribee Campus and is now part of the Centre for Environmental Safety and Risk Engineering.

Research Degrees
Masters by Research and Doctor of Philosophy degree programs are available. A wide variety of challenging research projects can be undertaken, including projects of a multi-disciplinary nature.

Entry to these awards is available to applicants who have achieved high honours results in their undergraduate course. Initial enquiries regarding research areas should be directed to the Centre on telephone (03) 9216 8027.

Academic Progression Guidelines and Unsatisfactory Progress
Normal progression through a course requires a student to complete any defined course year within one year of equivalent full-time enrolment. When all subjects in a course year are passed, a stage grading of 'year completed' may be given.

Any of the following may be considered to constitute unsatisfactory progress by a student:

- failure in any subject or unit for the second time;
- failure to complete the course within any maximum period defined by University Statute;
- failure to meet a conditional enrolment agreement.

As otherwise defined by University Statute, and subject to being invited to show cause, a student making unsatisfactory progress will normally be recommend for exclusion from the course.
Graduate Certificate in Performance-Based Building and Fire Codes

Course Code: ETQB

Course Objectives
The course aims to enable building surveyors and other allied professions to:

- make professional use of performance-based building codes;
- introduce the concepts and alternative acceptable frameworks for performance-based codes, with particular, but not exclusive, emphasis given to fire safety engineering design;
- provide appropriate knowledge and skills necessary for the assessment and application of performance-based and fire codes;
- develop a professional approach to performance-based codes and a recognition of when to assess designs which are within a persons field of expertise and when to refer designs onto a more appropriately qualified assessor;
- develop an appreciation of the legal, statutory and design integrity requirements and the need for compliance of the design assumptions throughout the operational life of the building.

Admission Requirements
To qualify for admission to the course an applicant must have successfully completed a diploma in Building Surveying or an equivalent qualification and at least two years of relevant professional experience.

Candidates with other academic qualifications can be admitted to the course provided they can demonstrate an equivalent combination of additional relevant professional experience and qualification.

A letter of recommendation and an interview may be required.

Graduates of the course may be offered advanced standing in the Graduate Diploma in Building Fire Safety and Risk Engineering.

Course Duration
The course is offered on a part-time basis over one year, and may be taken in the evenings (two evenings per week) or in block modules (four blocks of 4 days, spread throughout the year). Students must complete 60 credit points. The maximum time period in which to complete the course is three years.

Course Structure

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<td>Risk Assessment and Human Behaviour 15</td>
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<td>EOB5621</td>
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<table>
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<tr>
<th>Semester Two</th>
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<tr>
<td>EOB5632</td>
<td>Smoke and Fire Spread, Fire Safety System Design 15</td>
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<td>EOB5642</td>
<td>Performance Codes Methodology and Structure 15</td>
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Assessment
Assessment is by a combination of assignments and examination. Distribution of marks among each aspect of assessment is determined individually for each subject.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been met.

Graduate Diploma in Building Fire Safety and Risk Engineering

Course Code: EGQB

Course Objectives
The course aims to produce professionals who are familiar with fire science and technology fundamentals, who can apply rational engineering principles and techniques to identify cost-effective fire safety system designs for buildings, and will be familiar with the content and application of fire engineering design codes.

Admission Requirements
To qualify for admission to the course an applicant must have successfully completed a degree in engineering or a degree in science or building surveying.

A corresponding diploma having equivalent content of the relevant technical subjects will also be considered.

Relevant industrial experience is required.

Applicants must either have previously studied, or demonstrated a sound basic knowledge of the following topics: fluid dynamics, heat transfer, properties of materials and structural behaviour. Bridging subjects may be required to overcome any inadequacies.

A letter of recommendation and an interview may be required.

Provision will be made to enrol a limited number of students in the course who do not fully meet the required admission standards, but who have extensive relevant experience and demonstrated aptitude for high achievement. An interview will be required in this case.

Course Duration
The course is offered on a part-time basis and in block modules over two years. Students must complete 120 credit points. The maximum time period to complete the course is six years.

Course Structure

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester one</td>
<td></td>
</tr>
<tr>
<td>EOB5611</td>
<td>Risk Assessment and Human Behaviour 15</td>
</tr>
<tr>
<td>EOB5621</td>
<td>Fire Growth, Detection and Extinguishment 15</td>
</tr>
<tr>
<td>Semester two</td>
<td></td>
</tr>
<tr>
<td>EOB5632</td>
<td>Smoke and Fire Spread, Fire Safety System Design 15</td>
</tr>
<tr>
<td>EOB5642</td>
<td>Performance Codes Methodology and Structure 15</td>
</tr>
</tbody>
</table>
Safety System Design 15
EQB5642 Performance Codes Methodology and Structure 15

Year 2
Semester one
EQB5751 Fire Technology Modelling 15
EQB5761 Fire Safety Systems Modelling 15

Semester two
EQB5772 Fire Safety System Design 15
EQB5782 Fire Spread and Fire Safety System Design Project 15

Assessment
Assessment is by a combination of written projects, assignments, submissions, laboratory work and oral presentation. Distribution of marks among each aspect of assessment is determined individually for each subject.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Master of Engineering in Building Fire Safety and Risk Engineering (Coursework)

Course Code: EMQB

The course provides opportunities for professional people to develop advanced technical skills in a specialist discipline; develop their understanding of legislation and management relevant to their employment; develop ability to plan co-ordinate and complete complex projects; apply and extend research and reporting skills and gain specialist knowledge of a topic relevant to their employment.

Admission Requirements
To qualify for admission to the course applicants are expected to have completed a Graduate Diploma in Building Fire Safety and Risk Engineering with honours average.

Course Duration
The course is offered over three years on a part-time basis or its full-time equivalent. Students must complete 180 credit points.

Course Structure
The structure of the course is as follows:

Year 1
Semester one

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQB5611</td>
<td>Risk Assessment and Human Behaviour 15</td>
</tr>
<tr>
<td>EQB5621</td>
<td>Fire Growth, Detection and Extinguishment 15</td>
</tr>
</tbody>
</table>

Semester two

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQB5632</td>
<td>Smoke and Fire Spread, Fire 15</td>
</tr>
<tr>
<td>EQB5642</td>
<td>Performance Codes Methodology and Structure 15</td>
</tr>
</tbody>
</table>

Year 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQT6050</td>
<td>Building Fire Research – full-time 60 (over one semester)</td>
</tr>
<tr>
<td>EQT6060</td>
<td>Building Fire Research – part-time 30 (per semester for two semesters)</td>
</tr>
</tbody>
</table>

Assessment
Assessment is by a combination of written projects, assignments, submissions, laboratory work and oral presentations and by the satisfactory completion of a thesis. Distribution of marks for each aspect of the assessment is determined individually for each subject.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Masters (by Research)

Course Code: ERQR

Course Structure
Full-time: EQT6010
Part-time: EQT6020
Master of Science in Occupational Safety and Health, and Master of Science in Occupational Hygiene

The University of Greenwich, London, UK, in conjunction with the Centre for Environmental Safety and Risk Engineering, offers a 2 year program in the distance learning mode. The degree is awarded by the University of Greenwich.

Master of Science in Occupational Safety and Health

The course will necessitate completion of six taught units comprising five core units in:
• Occupational Safety Practice
• Safety and Risk Management
• The Monitoring, Analysis and Control of Toxic Substances in the Workplace
• Industrial Toxicology, Occupational Health Practice and Epidemiology
• The Thermal and Acoustic Environment.

In addition, students will take ONE unit from the following options. The optional units are:
• Lighting, Ionising and Non-Ionising Radiation
• Ergonomics and Industrial Psychology

Completion of the six units will give students the 90 credits for the award of a Postgraduate Diploma. The Master of Science will be completed via a 30 credit dissertation which will be based on an empirical investigation.

Master of Science in Occupational Hygiene

Students will be required to complete all the units offered in the Master of Science in Occupational Safety and Health, except the first unit, Occupational Safety Practice. Completion of the six units will give students the 90 credits for the award of a Postgraduate Diploma. The Master of Science will be completed via a 30 credit dissertation which will be based on an empirical investigation.

Doctor of Philosophy

Course Code: EPQR

Course Structure
Full-time: EQT6030
Part-time: EQT6040

Centre for Packaging, Transportation and Storage

Courses Offered
The Centre for Packaging, Transportation and Storage offers postgraduate courses leading to the award of:
• Graduate Certificate in Intermodal Freight Systems Management
• Doctor of Philosophy
• Master of Engineering (Research)

A wide variety of research projects are available. Most programs offer participation in industry projects.

The Centre also offers these undergraduate subjects in Packaging Technology, available within the School of the Built Environment:
• EMU4401 Transportation Dynamics
• EMU4402 Design and Testing of Containers

Focus
The Centre for Packaging, Transportation and Storage (CPTS) at Victoria University is a multi-disciplinary centre supported by scientists and engineers from departments across the University. Established in 1994, its purpose is to complement the University’s educational courses in packaging technology with research programs in areas concerned with the packaging, handling, transportation and storage of goods. In addition, the Centre undertakes technical studies and testing for industry clients and runs seminars, workshops and training programs related to packaging technology. Almost $2 million has been invested in the laboratory facilities.

The University is unique in Australia in having dedicated considerable resources toward high quality research in packaging. Current and future research programs include the Major Research Area of Food Science, Packaging and Marketing in its Research Management Plan.

Mission
The mission of the Centre is to be a leading, internationally recognised provider of education, research and related services in packaging, transportation and storage.

The Centre is particularly mindful of its role in the development of close links with industry, commerce and government through collaborative research, consultancy, educational and training programs and dissemination of technical information. It receives cooperation from several departments, schools and faculties.

Research Activities
Research projects currently being conducted include investigations on packaging materials properties under extreme environmental conditions, measurement, analysis and laboratory simulation of distribution environments, numerical modelling of storage of respiring produce, pesticide-free storage of grains, development of new techniques for packaging design and evaluation, odour characterisation and oxidative stability of packaging trims, fuzzy neural clustering techniques for grading and packaging produce, life cycle assessment of product packaging systems, among others.
Graduate Certificate in Intermodal Freight Systems Management

Course Code: ETIF

Course Objectives

The course seeks to provide transport specialists and managers with the background, analytical skills and techniques useful and necessary to manage intermodal freight – and elements in the systems – efficiently and effectively. Among other things it seeks to provide an understanding of: The nature and operational dynamics of integrated freight systems. Competition, competitive forces and competitive efficiency in markets and the way in which modal and intermodal markets operate. The economics of segmented transport systems and the cost efficient linehaul and interface operations. The institutional, operational and legal issues that impact on or affect intermodal systems and strategic development issues for intermodal systems capable of delivering significant competitive advantage to shippers, both nationally and internationally.

Admission Requirements

To qualify for admission to the course an applicant must have successfully completed a degree and a minimum of three years relevant work experience.

For applicants without a degree, a minimum of five years relevant work experience supported by evidence of professional attainment.

Course Duration

The course is taught in three, five day blocks. Each block is separated by about 10 to 12 weeks of term time, allowing the completion of research reports.

Course Structure

<table>
<thead>
<tr>
<th>Credit</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPM5000</td>
<td>Intermodal Freight Markets – Dynamics and Structure</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>EPM5001</td>
<td>Integrating Intermodal Freight Systems</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>EPM5002</td>
<td>Defining Strategies for Intermodal Freight Systems</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Assessment

As part of the assessment students are required to prepare written case studies, research reports and seminar papers. The students as part of their assessment are expected to present their reports via seminar. Group syndicate work is, in addition, an important part of activities and assessment. This part of the program focuses not only on problem solving and on the development of analytical skills but on group interaction, teamwork and joint research – all requiring and/or developing effective oral and written communication skills.

Telecommunication and Electronic Technologies Centre (TET)

Telecommunication and microelectronic is one of the Key Research Areas of the University. The research focus of the TET Centre is to create technologies that are required for the future wireless telecommunication services, internet services and microelectronic systems. These areas are currently experiencing major growth worldwide. Major industry groups are targeting their research centres involved in telecommunications and microeconomics both within Australia and overseas. The Centre is a partner in the Australian Telecommunication CRC (AT-CRC), Chipskills Program, Swedish Microelectronics Consortia and Heterogeneous Signal Processing Research Group.

Research Activities

Mobile Communication and Signal Processing
- System Consideration
- Air Interface
- Technology, Implementation and Software Radio

Microelectronic Systems
- Mixed Signal
- ASIC/DSP/Full Custom Design
- Analog and RF
- Microprocessor and Embedded Systems

Australia Telecommunications CRC
- Wireless Technologies
- Enabling Technologies

The Centre has well-established laboratories equipped, with modern test equipment and design tools to support all the above areas.

School of Communications and Informatics

The School embraces the disciplines of Electrical and Electronic Engineering, Applied Physics and Computer and Mathematical Sciences. These boast a range of research specialisations which include mobile communications: system design, digital signal processing and communication software, applied optical science, fibre optic sensors, fibre optic communications, laser physics and laser applications, photonics, thin film coatings and vacuum physics. The Mobile Communication and Signal Processing Group is part of the Australian Telecommunication CRC Program.

The research group in mathematical inequalities and applications (RGMIA) is the focus of an international collaboration of leading mathematicians in the area.

Additional areas of research focus include visual information and multimedia information systems, industrial automation and power systems, reliability, experimental design, statistical process control, database systems, parallel and image processing, computer networking, modelling and simulation and the theory and application of object-oriented languages. There is also interest in optimal pricing policies.

Electrical and Electronic Engineering course and staff specialist interests cover electronics, communications, power, control, and computer systems engineering.
School staff members are active in a number of research projects supported through the co-operation of industrial bodies and national research organisations.

The Applied Physics staff have research interests in applied optics, lasers and laser applications, optical fibres and fibre sensing, vacuum physics, surface physics, nuclear physics, remote atmospheric sensing, geophysics and acoustics.

Most of the research activities in this area come under the umbrella of the Optical Technology Research Laboratory. The facilities available are amongst the best in Australia and compare favourably with the best overseas.

### Postgraduate Programs by Research

The School offers the following research degrees:
- Doctor of Philosophy
- Master of Engineering
- Master of Science

Research topics compatible with the School's experimental facilities and staff expertise are negotiated between student and supervisors. A number of research programs are available in the above areas. In addition, applicants with interests in similar areas are encouraged to discuss them with the School, telephone (03) 9688 4492/4703.

A booklet with more specific research details for the benefit of prospective students is available on request.

### Minimum Standards of Entry

Applicants should have formal qualifications and experience at least equivalent to an Australian four year Bachelor's degree with Honours in an appropriate discipline. Applicants wishing to undertake a PhD who do not already possess a Master's degree will normally be expected to enrol initially for a Master's degree and will be considered for transfer to PhD candidature after one year of study.

All overseas applicants must provide evidence of proficiency in the English language:
- IELTS – an overall band score of 6.5, subject to individual profile; or
- TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

### Program Duration

Candidates will undertake research in one of the above areas and will be examined by dissertation (thesis). Candidates may be required to undertake some theory courses as part of the overall higher degree program. Any such courses will be specified at the time of commencement.

A full-time research Masters degree will normally take up to two years and a PhD degree is likely to take a minimum of three years.

### Master of Science (Research)

**Course Code:** SRNL

### Course Structure

- ECI8000 Research (Full Time)
- ECI8010 Research (Part Time)

### Doctor of Philosophy

**Course Code:** SPNL, EPER, SPSC

### Course Structure

- ECI8000 Research (Full Time)
- ECI8010 Research (Part Time)

### Coursework Programs

The School offers a range of coursework programs at postgraduate level:

1. **Graduate Certificate in:**
   - Microelectronic Engineering

2. **Graduate Diplomas in:**
   - Communication Systems
   - Computer Science
   - Computer and Mathematical Sciences
   - Digital Control
   - Microelectronic Engineering
   - Multimedia Information Networking
   - Software Engineering

3. **Master of Engineering in:**
   - Electrical and Electronic Engineering
   - Microelectronic Engineering

4. **Master of Engineering Science in:**
   - Computer Systems Engineering
   - Systems and Computer Control
   - Telecommunication Engineering

5. **Master of Science in:**
   - Computer Science
   - Computer and Mathematical Sciences
   - Software Engineering

### Graduate Diploma in Communication Systems

**Course Code:** EGET

### Course Objectives

This postgraduate program, first offered in 1979 and reaccredited in 1985 and 1989 is designed to extend the education of practising engineers.

The main objective of the course is to provide practising engineers with advanced training in modern communication systems and associated technologies. Specifically, the course is designed to assist engineers in acquiring specialist knowledge not normally available in undergraduate courses and keep abreast with new developments in communication technology.

The course also helps communication engineers to broaden their technical horizon and develop new skills in other areas of communication engineering which are outside their immediate expertise.
**Admission Requirements**

To qualify for admission to the course an applicant must have successfully completed a degree in electrical, electronic or communication engineering, or have successfully completed other appropriate qualifications and relevant professional experience.

Full fee paying international students must have qualifications which are equivalent to those listed above. In addition they must provide evidence of proficiency in the English language:
- IELTS – an overall band score of 6.0, subject to individual profile; or
- TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

**Course Duration**

The course is offered on a full-time basis over one year or on a part-time basis over an equivalent period of time. Completion of the course requires the accumulation of 120 credit points.

**Course Structure**

The program is made up of three compulsory subjects, six elective subjects, and a Case Study. The compulsory subjects and the Case Study form the core. The core subjects are designed to give students the necessary theoretical background, programming skills, and exposure to independent study while the elective subjects (to be chosen from a comprehensive set), offer a high degree of specialization.

The elective subjects are common with the School's Master of engineering Science (by coursework) programs. Eligible students wishing to transfer to the Masters programs can claim credit for these subjects completed in the Graduate Diploma.

### Credit

<table>
<thead>
<tr>
<th>Semester one</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEC5010 High Level Language Programming</td>
<td>12</td>
</tr>
<tr>
<td>EET5510 Communication Theory</td>
<td>12</td>
</tr>
<tr>
<td>SCM5811 Operating Systems</td>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester two</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET5500 Communication Systems</td>
<td>12</td>
</tr>
<tr>
<td>4 Elective Subjects</td>
<td>48</td>
</tr>
</tbody>
</table>

### Elective subjects

- EET6511 Data Network Analysis and Design 12
- EET6521 Digital Switching and Signalling Systems 12
- EET6531 Wireless Communication Subsystems 12
- EET6541 Multimedia and Internet Technology 12
- EET6551 Microwave Electronic Circuit Design 12
- EET6561 Local Area and Broadband Networks 12
- EET6512 Intelligent Networks and Network Management 12

### Assessment

Assessment will be a combination of written assignments, tests, laboratory work, project work and examinations. Except in special circumstances, supplementary assessment will not be available.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

**Graduate Diploma in Computer Science**

**Course Code:** SGCS

**Graduate Diploma in Computer and Mathematical Sciences**

**Course Code:** SGCM

### Course Objectives

The Graduate Diploma programs are designed for graduates who want to acquire professional competence in Computer Science and/or the Mathematical Sciences.

Each Graduate Diploma develops graduates who have a sound conceptual foundation, including practical understanding of recent developments in computer technology and how these may be applied to solve a wide range of problems in business and industry. The Graduate Diploma in Computer and Mathematical Sciences offers a strong mathematical sciences component.

### Admission Requirements

Entry to each course is open to applicants with a first degree. Preference will be given to applicants whose degree contains major studies in a quantitative discipline. Other applicants whose occupation or experience indicates that they have the capacity to succeed may be accepted into the course.

### Course Duration

Each course is offered on both a full-time and a part-time basis. Part-time students will normally take two years to complete the course. Lectures will normally be offered in the evenings, however, some of the subjects are available during the day.
Course Structure
Two streams of subjects are available:

**Computer Science:**
- Computer Programming
- Information Systems & Software Engineering
- Multimedia & Networking

**Mathematical Sciences:**
- Production and Distribution Management
- Finance and Marketing Statistics

The courses provide maximum flexibility allowing specialisation in either one or a combination of the two streams.

To complete a Graduate Diploma, students are required to pass the equivalent of eight semester subjects. All subjects are three hours per week.

For the award of Graduate Diploma in:

**Computer Science Stream**
- SCM5800  Object Oriented Programming GD1
- SCM5802  Information Systems
- SCM5803  Data Structures and Programming
- SCM5804  Software Engineering
- SCM5805  Communication and Networks
- SCM5807  Advanced Information Systems
- SCM5811  Operating Systems
- SCM5813  Artificial Intelligence
- SCM5819  Cobol Programming
- SCM5821  Introduction to Multimedia Systems
- SCM5824  Object Oriented Programming GD2

**Mathematical Sciences Stream**
- SCM5404  Financial Decision Support Systems
- SCM5601  Statistical Forecasting
- SCM5602  Quality Management and Statistics
- SCM5901  Introduction to Decision Support Systems
- SCM5902  Optimisation Techniques
- SCM5903  Systems and Simulation Studies
- SCM5904  Production and Distribution Management

Students study eight subjects, each worth 15 credit points.

**Progression Regulations**
The School's Academic Committees (Examiners' Meetings) will, at the end of each semester, consider the results and progress of all students enrolled in the course.

Progression is based on the following guidelines:
(i) Where any subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.
(ii) Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the pre-requisite subjects.

**Unsatisfactory Progress**
These regulations should be read in conjunction with Victoria University's Statute 6.4.1. – Unsatisfactory Progress. The following regulations apply to both full-time and part-time students:
(i) The following shall constitute unsatisfactory progress:
   (a) failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study,
   (b) failure in any subject twice,
   (c) transgression of a conditional enrolment stipulation and agreement.
(ii) Where a student's progress is unsatisfactory, the Departmental Academic Progress Committee may recommend the following:
   (a) a restricted and conditional enrolment only be approved,
   (b) exclusion from the course.
(iii) A student who wishes to appeal against the Department's written recommendation is required to do so in accordance with the University's Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University's Statutes.
(iv) Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of exclusion. The student must provide, with his or her application, evidence of changed circumstances which significantly improve the applicant's likelihood of academic success.

Graduate Diploma in Multimedia Information Networking

**Course Code:** SGMN

**Course Objectives**
The aim of this course is to impart fundamental knowledge and training to people with non-computing backgrounds in the application and development of Multimedia Information Networks.

The fundamental knowledge provides students with the ability to adapt to different computing platforms, application environments and rapid technological advancements encountered in the workplace.

Students will be able to gain employment in the Network Management area, as well as in the areas of Multimedia systems development, and Multimedia applications.

**Admission Requirements**
To qualify for admission to the course an applicant must have successfully completed an undergraduate degree in a non-computing discipline. Equivalent academic standing based on successful completion of recognised courses and industrial experience may also be considered sufficient for admission to the course.

**Course Duration**
Graduate Diploma in Multimedia Information Networking will require one year of full-time study, or equivalent part-time study. Classes will be scheduled to cater for part-time students.

**Course Structure**
The course will cover the following four areas, each comprising two subjects:
- Computer Systems and Programming
- Financial Decision Support Systems
- Statistical Forecasting
- Quality Management and Statistics
- Introduction to Decision Support Systems
- Optimisation Techniques
- Systems and Simulation Studies
- Production and Distribution Management

180
• Information Systems
• Data Communication and Networks
• Multimedia Systems.

The subjects offered in the course are:
SCM5800 Object Orien t ed Programming GD1
SCM5802 Communication and Networks
SCM5805 Advanced Information Systems
SCM5824 Object Orien t ed Programming GD2
SCM5820 Network Operating Systems Administration
SCM5821 Introduction to Multimedia Systems
SCM5822 Networked Multimedia Systems

Students study eight subjects, each worth 15 credit points.

Progression Regulations
The School’s Academic Committees (Examiners' Meetings) will, at the end of each semester, consider the results and progress of all students enrolled in the course.

Progression is based on the following guidelines:
(i) Where any subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.
(ii) Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the pre-requisite subjects.

Unsatisfactory Progress
These regulations should be read in conjunction with Victoria University’s Statute 6.4.1. – Unsatisfactory Progress. The following regulations apply to both full-time and part-time students.

(i) The following shall constitute unsatisfactory progress:
   (a) failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study;
   (b) failure in any subject twice;
   (c) transgression of a conditional enrolment stipulation and agreement.

(ii) Where a student's progress is unsatisfactory, the School Academic Progress Committee may recommend the following:
   (a) a restricted and conditional enrolment only be approved;
   (b) exclusion from the course.

(iii) A student who wishes to appeal against the School’s written recommendation is required to do so in accordance with the University's Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University's Statutes.

(iv) Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of exclusion. The student must provide, with his or her application, evidence of changed circumstances which significantly improve the applicant’s likelihood of academic success.

Graduate Diploma in Software Engineering
Course Code: SGSE

Course Objectives
The Graduate Diploma program is designed for graduates who want to acquire professional competence in software engineering.

The Graduate Diploma program develops graduates to have a sound knowledge and technical skills in the areas of software specification, design, implementation and management. This program has strong programming and software engineering components.

Successful students can articulate with full credit into the Master of Science in Software Engineering program.

Admission Requirements
Entry to this course is open to applicants with a first degree. Preference will be given to applicants whose degree contains major studies in a quantitative discipline. Other applicants whose occupation or experience indicates that they have the capacity to succeed may be accepted into the course.

Course Duration
The course is offered on both a full-time and a part-time basis. Part-time students will normally take two years to complete the course. Lectures will normally be offered in the evenings, however, some of the subjects are available during the day.

Course Structure
To complete the Graduate Diploma in Software Engineering requires the successful completion of six(6) cores subjects and two (2) elective subjects.

Core Subjects

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG5012</td>
<td>Managing Software Projects</td>
<td>15</td>
</tr>
<tr>
<td>SCM5800</td>
<td>Object Oriented Programming GD1</td>
<td>15</td>
</tr>
<tr>
<td>SCM5824</td>
<td>Object Oriented Programming GD2</td>
<td>15</td>
</tr>
<tr>
<td>SCM6822</td>
<td>Internet Programming</td>
<td>15</td>
</tr>
<tr>
<td>SCM6803</td>
<td>Software Engineering</td>
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</tr>
<tr>
<td>SCM6804</td>
<td>Software Engineering</td>
<td>2</td>
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</tbody>
</table>

Elective Subjects

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>SCM5802</td>
<td>Information Systems</td>
<td>15</td>
</tr>
<tr>
<td>SCM5803</td>
<td>Data Structures and Programming</td>
<td>15</td>
</tr>
<tr>
<td>SCM5805</td>
<td>Communication and Networks</td>
<td>15</td>
</tr>
<tr>
<td>SCM5813</td>
<td>Artificial Intelligence</td>
<td>15</td>
</tr>
<tr>
<td>SCM5820</td>
<td>Network Operating Systems Admin</td>
<td>1</td>
</tr>
</tbody>
</table>

Plus appropriate electives from other graduate programs.
Progression Regulations

The School's Academic Committees (Examiners' Meetings) will, at the end of each semester, consider the results and progress of all students enrolled in the course.

Progression is based on the following guidelines:

(i) Where any subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.

(ii) Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the pre-requisite subjects.

Unsatisfactory Progress

These regulations should be read in conjunction with Victoria University's Statute 6.4.1. – Unsatisfactory Progress. The following regulations apply to both full-time and part-time students.

(i) The following shall constitute unsatisfactory progress:
   (a) failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study;
   (b) failure in any subject twice;
   (c) transgression of a conditional enrolment stipulation and agreement.

(ii) Where a student's progress is unsatisfactory, the Departmental Academic Progress Committee may recommend the following:
   (a) a restricted and conditional enrolment only be approved;
   (b) exclusion from the course.

(iii) A student who wishes to appeal against the Department's written recommendation is required to do so in accordance with the University's Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University's Statutes.

(iv) Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of exclusion. The student must provide, with his or her application, evidence of changed circumstances which significantly improve the applicant's likelihood of academic success.

Master of Engineering in Electrical and Electronic Engineering (Coursework)

NOTE: There will be no intake into this course in 2002.

Course Code: EMEE

The Master of Engineering (Coursework) was introduced in 1988. The course which is application oriented, is intended for those who aspire to senior technical positions in the telecommunication industry, or in technical organisations with major computer based products or processes, or in the computer industry.

Course Objectives

The objective of the course is to provide practising electrical, electronic or computer systems engineers with higher levels of knowledge and skill in their field.

The course enables graduates to:

- broaden their technological base from their first degree in electrical engineering or a relevant science;
- develop an extended capacity to carry out independent research and development work in the course of employment;
- develop an in-depth understanding of relevant electrical, electronic or computer systems design and operation;
- have a sound coursework base for further research in electrical, electronic or computer systems engineering.

Admission Requirements

To qualify for admission to the course an applicant must have successfully completed an engineering degree in electrical engineering with honours, or at an equivalent standard with a minimum overall average of 65%, and have completed a period of relevant work experience.

Applicants with other engineering degrees or applied science degrees may be eligible for admission but they may be required to first complete preliminary studies.

Full fee paying international students must have qualifications which are equivalent to those listed above. In addition they must provide evidence of proficiency in the English language:

IELTS – an overall band score of 6+, subject to individual profile; or

TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

Course Duration

The course is offered over one-and-one-half years for full-time students or the part-time equivalent. Students must complete 180 credit points.

Course Structure

All students are required to undertake a total of twelve study units which includes a minor thesis/project unit counted as equivalent to four/two study units. Each study unit is equivalent to 15 credit points and represents three hours Class Contact per week for one semester. Thesis/project unit is to be carried out in the final year of the course and it is expected that students undertake independent experimental and analytical studies. Thesis/project unit related to industrial projects which are of suitable scope and depth is encouraged.

Students have the flexibility of choosing a combination of study units to make up the required twelve units of study, subject to the following restrictions.

Students must complete at least a four-study-units major sequence and a two-study-units minor sequence. The major sequence selected is considered to be the student's area of specialisation.

In addition to the two-study-units minor sequence, all students must complete at least one other study unit outside their area of specialisation.

Students may select up to an equivalent of three study units from other Master Degree courses with approval from the Course Coordinator.

Thesis project work must be in the student's area of specialisation.
The five areas of specialisation including the appropriate compulsory sequence and electives, are as follows:

**Software Engineering Sequence**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG5011</td>
<td>Software Engineering</td>
<td>15</td>
</tr>
<tr>
<td>EEG5012</td>
<td>Managing Software Projects</td>
<td>15</td>
</tr>
<tr>
<td>EEG5015</td>
<td>Applied Knowledge Systems</td>
<td>15</td>
</tr>
<tr>
<td>EEG5016</td>
<td>Computer Networking</td>
<td>15</td>
</tr>
<tr>
<td>Elective:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEG5024</td>
<td>Object Oriented Software</td>
<td>15</td>
</tr>
</tbody>
</table>

**Automation System Engineering Sequence**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG5311</td>
<td>Digital Control</td>
<td>15</td>
</tr>
<tr>
<td>EEG5312</td>
<td>Control System Design</td>
<td>15</td>
</tr>
<tr>
<td>EEG5313</td>
<td>Optimal Control</td>
<td>15</td>
</tr>
<tr>
<td>EEG5314</td>
<td>Adaptive Control Systems</td>
<td>15</td>
</tr>
<tr>
<td>Elective:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEG5222</td>
<td>Power System Operation Control</td>
<td>15</td>
</tr>
<tr>
<td>EEG5223</td>
<td>Digital Simulation of Protection Systems</td>
<td>15</td>
</tr>
<tr>
<td>EEG5321</td>
<td>Robotics</td>
<td>15</td>
</tr>
<tr>
<td>EE6322</td>
<td>Process Instrumentation and Control</td>
<td>15</td>
</tr>
</tbody>
</table>

**Communication Engineering Sequence**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET5510</td>
<td>Communication Theory</td>
<td></td>
</tr>
<tr>
<td>EEG5421</td>
<td>Microwave Electronic Circuit Design</td>
<td>15</td>
</tr>
</tbody>
</table>

**Computer Technology Sequence**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG5111</td>
<td>Computer Technology</td>
<td>15</td>
</tr>
<tr>
<td>EEG5112</td>
<td>Microelectronic Design</td>
<td>15</td>
</tr>
<tr>
<td>EEG5113</td>
<td>Advanced Microprocessors</td>
<td>15</td>
</tr>
<tr>
<td>EEG5114</td>
<td>Operating Systems and Multiprocessing</td>
<td>15</td>
</tr>
<tr>
<td>Elective:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEG5122</td>
<td>Digital System Modelling and Simulation</td>
<td>15</td>
</tr>
</tbody>
</table>

**Information Technology Sequence**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG5013</td>
<td>Data Base and Query Systems</td>
<td>15</td>
</tr>
<tr>
<td>EEG5016</td>
<td>Computer Networking</td>
<td>15</td>
</tr>
<tr>
<td>EEG5111</td>
<td>Computer Technology</td>
<td>15</td>
</tr>
<tr>
<td>EEG5114</td>
<td>Operating Systems and Multiprocessing</td>
<td>15</td>
</tr>
<tr>
<td>Elective:</td>
<td>Common to Software Engineering and/or Computer Technology</td>
<td></td>
</tr>
<tr>
<td>EEG5601</td>
<td>Project work (2 units over 2 semesters)</td>
<td>30</td>
</tr>
<tr>
<td>EEG5602</td>
<td>Project work (2 units in 1 semester)</td>
<td>30</td>
</tr>
<tr>
<td>EEG5611</td>
<td>Minor thesis (4 units over 4 semesters)</td>
<td>60</td>
</tr>
<tr>
<td>EEG5612</td>
<td>Minor thesis (4 units over 2 semesters)</td>
<td>60</td>
</tr>
<tr>
<td>EEG5614</td>
<td>Minor thesis (4 units in 1 semester)</td>
<td>60</td>
</tr>
</tbody>
</table>

**Assessment**

Assessment will be a combination of written assignments, tests, laboratory work, project work and examinations. Supplementary assessment is not available except in special circumstances when authorised by the Head of School.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

**Master of Engineering Science in Computer Systems Engineering(Coursework)**

Course Code: EMCM

**Course Objectives**

The computer systems engineer today is faced with many challenges brought about by the rapid advances in computer multimedia and telecommunication technology. The recent development of computer systems engineering has already established a firm foundation for a need of qualified engineers in this high technology industry.

The M.Eng.Sc. course in Computer Systems Engineering addresses all aspects of this technology. From high level specification of computer and microelectronic systems, through implementation alternatives, to realisation of chips and also introduces students to the anticipated demands of Information Technology in the twenty first century. Course material is drawn from a variety of backgrounds and includes: Integrated Circuit Design Methodologies, Digital and Analog Circuit Design, and Computer System Design and Implementation. The course aims to produce engineers with the necessary skills and practical experience to satisfy the requirements of the microelectronics industry. An important feature of the course is the opportunity it provides for the students to design their own integrated circuits.

The specific aims of the course are to: provide an integrated foundation for electrical disciplinary studies and course specialisation into the area of Computer Systems Engineering; develop the advanced technical skills necessary to master state of the art microelectronic technology; develop research skills necessary to obtain specialist knowledge of subjects pertinent to a given field of study; cultivate logical and lateral thinking that leads to creation and innovation in the pursuit of solutions to engineering problems.
Admission Requirements

Admission to the course requires a four year Bachelor of Engineering degree in Electrical & Electronic Engineering or a four year Bachelor of Applied Science (Honours) degree in an appropriate field, or an equivalent.

Applicants with a three year Bachelor of Applied Science degree (in an appropriate field) or a Bachelor of Engineering degree in another field may also be considered for admission on the condition that they may be required to complete some preliminary subjects that will strengthen their knowledge and skills in Computer Systems Engineering.

Full-fee paying international students are required to have qualifications equivalent to those above, and in addition, they must provide evidence of proficiency in English Language, as assessed by; (a) International English Language Testing System – an overall band score of 6+ subject to individual profile, or, (b) Test of English as a Foreign Language – a score of 550+, and a Test of Written English score of 5+.

Course Duration

The course is of one year duration for full-time students and a part-time equivalent for part-time students.

Course Structure

The course is unit based and consists of research projects (2 units), core units and elective subjects. The completion of the course requires successful completion of two units of research project, two core units and at least six units of elective subjects of which at least four must be from Computer Systems Engineering disciplines. Students will be allowed to take a limited number (maximum of two) of elective subjects from the postgraduate courses of other disciplines.

Research Project:
EEH6101 ASIC Design 12
EEH6102 Custom IC Design B 12

Core Subjects:
EEH6122 Custom IC Design A 12
EEH6151 VHDL and High Level Synthesis 12

Elective Subjects:
EEC5801 Operating System and Multiprocessing 12
EEG5011 Software Design 12
EEG5016 Computer Engineering 12
EEH6111 Digital Design 12
EEH6121 Basic IC Design 12
EEH6132 Integrated Circuits 12
EEH6142 Emerging Technologies 12
EEH6152 Advanced Microprocessors 12
EEY4002 Computer Systems 4.2

Credit points

Assessment

Assessment will be based on a combination of written assignments, laboratory exercises, project works, tests, and examinations.

Master of Engineering in Microelectronic Engineering

Course Code: EMMI

The major role of professional engineers in the Australian workforce is to act as agents for change through the development of technically sound, economically viable and socially acceptable solution to complex and new technical problems.

In this context, the microelectronics engineer today is faced with many challenges brought about by the rapid advances in computer, multimedia and telecommunication technology. The Master of Engineering course in Microelectronic Engineering addresses all aspects of this technology, from high level specification of microelectronic systems, through implementation alternatives, and the effective use of design tools, to realisation of integrated circuits. The course aims to produce engineers with the necessary skills and practical experience to satisfy the requirements of the microelectronics industry. An important feature of the course is the opportunity it provides for the students to design their own integrated circuits.

The Chipskills project is a Victorian Government initiative that seeks to develop a range of professional and vocational training programs in areas relevant to the semiconductor industry. The project involves a consortium of Victorian universities, TAFE colleges and industries.

Development and delivery of this course will be shared between each of the partner universities.

Course Objectives

The general aims of the course are to provide graduates with:

(a) high levels of both logical and lateral thinking development so that the graduates can lead constructive change through innovation;
(b) the ability to use a multi-disciplinary engineering philosophy towards the synthesis, design and integration of solutions; and
(c) a level of professional development in confidence, judgement and experience such that the implementation of proposed solutions proceeds successfully.

The specific aims of the course are to:

(a) develop integrated circuit design expertise in embedded systems, digital, mixed signal and system-on-chip systems design and verification;
(b) develop a basic understanding of the device physics, the fabrication process and the testing to the level needed by IC designers;
(c) develop the advanced technical and algorithmic skills necessary to master state of the art microelectronic technology;
(d) develop research skills necessary to obtain specialist knowledge of issues pertinent to integrated circuit design;
(e) cultivate logical and lateral thinking that leads to creation and innovation in the pursuit of solutions to engineering problems.

**Admission Requirements**

Admission to the course normally requires a four year Bachelor of Engineering degree in Electronic Engineering or Computer Engineering or Communication/Telecommunication Engineering or a four year Bachelor of Science (Honours) degree in an appropriate field, or an equivalent qualification.

Applicants with a three year Bachelor of Science degree (in appropriate field) or a Bachelor of Engineering degree in another field may also be considered for admission on the condition that they may be required to take additional (preliminary) subjects that will strengthen their knowledge and skills in digital systems, analog electronics and microprocessor systems.

Full fee paying international students must have qualifications which are equivalent to those listed above. In addition they must provide evidence of proficiency in the English language as assessed by:

- IELTS – an overall band score of 6+, subject to individual profile;
- or
- TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

A panel comprising of academics from each of the partner universities will carry out student selection into this course.

**Course Duration**

The duration of the course, in normal mode of delivery, is one and a half years full-time or part-time equivalent.

**Course Structure**

The Master of Engineering course is structured to allow students to exit at different academic levels with either, Graduate Certificate, Graduate Diploma or Master of Engineering qualifications. The completion of the Graduate Certificate in Microelectronic Engineering requires successful completion of four units, Graduate Diploma in Microelectronic Engineering requires successful completion of either eight units or six units and minor project, and Master of Engineering in Microelectronic Engineering requires successful completion of either eight units and major project or ten units and minor project.

### Core Units

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE6008</td>
<td>VLSI Digital Signal Processing Systems</td>
<td>10</td>
</tr>
<tr>
<td>EEE6009</td>
<td>Reliability and Testability in IC Design</td>
<td>10</td>
</tr>
<tr>
<td>EEE6010</td>
<td>Introduction to Microsystems Technology</td>
<td>10</td>
</tr>
<tr>
<td>EEE6011</td>
<td>Introduction to Semiconductor Device Fabrication</td>
<td>10</td>
</tr>
<tr>
<td>EEE6012</td>
<td>Introduction to Microelectronics</td>
<td></td>
</tr>
<tr>
<td>EEE6013</td>
<td>Project Management &amp; Entrepreneurship</td>
<td>10</td>
</tr>
<tr>
<td>EEE6014</td>
<td>RF and Mixed Signal Design</td>
<td>10</td>
</tr>
<tr>
<td>EEE6020</td>
<td>Minor Project</td>
<td>20</td>
</tr>
<tr>
<td>EEE6030</td>
<td>Major Project</td>
<td>40</td>
</tr>
</tbody>
</table>

### Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE6001</td>
<td>HDL and High Level Synthesis</td>
<td>10</td>
</tr>
<tr>
<td>EEE6002</td>
<td>Circuit Design</td>
<td>10</td>
</tr>
<tr>
<td>EEE6003</td>
<td>tools and Design Methodology</td>
<td>10</td>
</tr>
<tr>
<td>EEE6004</td>
<td>Digital System Design</td>
<td>10</td>
</tr>
<tr>
<td>EEE6005</td>
<td>Embedded Systems Design</td>
<td>10</td>
</tr>
<tr>
<td>EEE6006</td>
<td>Emerging Topics in IC Design</td>
<td>10</td>
</tr>
<tr>
<td>EEE6007</td>
<td>VLSI Design</td>
<td>10</td>
</tr>
</tbody>
</table>

### Assessment

Assessment will be a combination of written assignments, tests, laboratory work, project work and examinations. Supplementary assessment is not normally available in any unit except at the discretion of the Head of School/Department of the University offering the unit and under exceptional circumstances.

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**Master of Engineering Science in Telecommunication Engineering (Coursework)**

**Course Code:** EMTE

The Master of Engineering Science in Telecommunication Engineering was introduced in 1998. It is intended for those who seek entry or are currently involved in the telecommunication industry who would require expertise in a range of fields in the telecommunication engineering discipline.

**Course Objectives**

The objective of the course is to provide opportunities for suitably qualified persons to (a) acquire expertise, (b) develop research skills, and (c) enhance communication skills, necessary to elucidate complex technical problems and perceived solutions in the field of telecommunication engineering.

**Admission Requirements**

Admission to the course requires a four year Bachelor of Engineering degree in Electrical & Electronic Engineering or a four year Bachelor of Applied Science. (Honours) degree in an appropriate field, or an equivalent. Applicants with a three year Bachelor of Applied Science degree (in an appropriate field) or a Bachelor of Engineering degree in another field may also be considered for admission on the condition that they may be required to complete some preliminary studies.

Full-fee paying international students are required to have qualifications equivalent to those above, and in addition, they must provide evidence of proficiency in English Language, as assessed by:

- International English Language Testing System – an overall band score of 6+ subject to individual profile; or,
Test of English as a Foreign Language – a score of 550+, and a Test of Written English score of 5+.

**Course Duration**
The course is of one year duration for full-time students and a part-time equivalent for part-time students.

**Course Structure**
The course is unit based and consists of a research project of 2 units and a set of elective subjects each of 1 unit. The completion of the course requires the completion of the project and 8 other subjects of which at least 5 must be from the Telecommunication Engineering discipline.

<table>
<thead>
<tr>
<th>Semester One</th>
<th>Credit</th>
<th>points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET6500 Research Project</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester Two</th>
<th>Credit</th>
<th>points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET6500 Research Project</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Elective Subjects**
EET6511 Data Network Analysis and Design 12
EET6512 Intelligent Networks and Network Management 12
EET6521 Digital Switching and Signalling Systems 12
EET6522 Telecommunication Tariff Structures and Teletraffic Engineering 12
EET6531 Wireless Communication Subsystems 12
EET6532 Microwave and Satellite Communication Systems 12
EET6541 Multimedia and Internet Technology 12
EET6542 Mobile and Personal Communication Systems 12
EET6551 Microwave Electronic Circuit Design 12
EET6552 Computer Networks and Networking Software 12
EET6561 Local Area and Broadband Networks 12
EET6562 Digital Signal Processing 12

**Assessment**
Assessment will be based on a combination of written assignments, laboratory exercises, project work, tests and examinations.

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**Master of Science in Computer Science**

Course Code: SMCS

**Master of Science in Computer and Mathematical Sciences**

Course Code: SMCM

**Course Objectives**
The Masters programs develop a sound theoretical knowledge of contemporary Computer Science techniques and/or the techniques in one specified field of study from the Mathematical Sciences. Emphasis is also placed on the application of these techniques in areas of business and industry.

**Admission Requirements**
To qualify for admission to the course an applicant must have successfully completed an appropriate degree or an equivalent combination of qualifications and experience. Applicants must be competent in tertiary level mathematics and computing (which may have to be demonstrated in special tests). Applicants with any of the following qualifications may apply for credits against specific coursework subjects up to the indicated maximum.

(a) A degree in computer science (4)
(b) A four year honours degree in computer science (12)
(c) A pass degree (without a major in computer science) followed by an appropriate graduate diploma (8)
(d) A combination of qualifications and experience equivalent to (a), (b), or (c) above.

**Course Duration**
The course is offered on a full-time basis over two years or on an equivalent part-time basis. For candidates given credit, the minimum duration must be at least the equivalent of one and a half years of full-time study following a three year degree.

**Course Structure**

**Computer Science**

SCM6801 Object Oriented Technology 1M
SCM6802 Object Oriented Technology 2M
SCM6803 Software Engineering 1M
SCM6804 Software Engineering 2M
SCM6811 Information Network Design and Development
SCM6819 User Interface Design
SCM6820 Distributed Systems
SCM6821 Decision Support Technology
SCM6822 Internet Programming
SCM6823 Database Design, Management and Administration Minor Thesis
SCM6824 Advanced Database Paradigms
SCM6825 Multimedia Systems Design and Development
SCM6826 Intelligent Agents
SCM6827 Research Perspectives in Computer Science

Mathematical Sciences

SCM6502 Image Processing Algorithms
SCM6601 Reliability and Maintenance
SCM6603 Statistical Control of Continuous Processes
SCM6604 Experimental Design
SCM6605 Regression Analysis
SCM6606 Time Series Analysis
SCM6608 Multivariate Analysis
SCM6902 Mathematical Programming 1
SCM6903 Mathematical Programming 2
SCM6904 Simulation
SCM6905 Sequencing and Scheduling
SCM6906 Optimisation Techniques

Minor Thesis

Each subject is worth 15 credit points.

Students must obtain a pass in:

• 14 semester units and a thesis equivalent to two semester units; or
• 12 semester units and a thesis equivalent to four semester units.

For the award of MSc in Computer Science, at least 8 units must be selected from the Computer Science stream. For the award of MSc in Computer and Mathematical Sciences, at least 6 units must be selected from the Mathematical Sciences stream.

Thesis

Where possible the candidate will be encouraged to choose a topic related to his/her own work situation or with consulting projects being carried out by the School.

SCM6102 – 30 credit points
SCM6103 – 60 credit points

Progression Regulations

The School's Academic Committees (Examiners' Meetings) will, at the end of each semester, consider the results and progress of all students enrolled in the course.

Progression is based on the following guidelines:

(i) Where any subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.

(ii) Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the pre-requisite subjects.

Unsatisfactory Progress

These regulations should be read in conjunction with Victoria University's Statute 6.4.1. – Unsatisfactory Progress. The following regulations apply to both full-time and part-time students.

(i) The following shall constitute unsatisfactory progress:

(a) failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study,

(b) failure in any subject twice,

(c) transgression of a conditional enrolment stipulation and agreement.

(ii) Where a student's progress is unsatisfactory, the School's Academic Progress Committee may recommend the following:

(a) a restricted and conditional enrolment only be approved,

(b) exclusion from the course.

(iii) A student who wishes to appeal against the School's written recommendation is required to do so in accordance with the University's Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University's Statutes.

(iv) Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of exclusion. The student must provide, with his or her application, evidence of changed circumstances which significantly improve the applicant's likelihood of academic success.

Supplementary Assessment

(i) Supplementary assessment is not normally available in any subject or course of the School, other than for reasons of Special Consideration of Illness or other cause.

(ii) In special circumstances the Head of School may authorise supplementary assessment in one or more subjects, for example:

• for major discipline subjects taken for the first time; and

• where the student's normal assessment was unsatisfactory in a small minority of subjects studied in a year, but had aggregate results significantly above pass level; and

• where a satisfactory supplementary result is a reasonable expectation of the student.

(iii) Supplementary assessment may be initiated by a subject Examination Board or the course School, where appropriate special grounds are seen to exist.

(iv) Supplementary assessment will require application, authorisation, and the payment of fees as defined by the School from time to time.

Master of Science in Software Engineering

Course Code: SMSE

Course Objectives

The Master of Science in Software Engineering provides students with the basic knowledge and technical skills in the areas of software specification, design and implementation. Specific skills pertinent to the development and management of large software projects. Human communication skills including the professional presentation of ideas, designs and solutions, and the documentation associated with software development projects. Human communication skills including the professional presentation of ideas, designs and solutions, and the documentation associated with software development projects. Management skills, in relation to: a software project from concept to delivery; the units derived during software development; people, as part of a team and as a leader. The
ability to deal with constantly changing technology by using knowledge and understanding of concepts and applying them to real problems in a variety of contexts. Professional awareness, including social and legal responsibility and ethics.

**Admission Requirements**

To qualify for admission to the course an applicant must have successfully completed an appropriate degree or an equivalent combination of qualifications and experience.

Applicants must be competent in tertiary level mathematics and computing (which may have to be demonstrated in special tests).

Applicants with any of the following qualifications may apply for credits against specific coursework subjects up to the indicated maximum.

1. A degree in computer science (4)
2. A four year honours degree in computer science (12)
3. A pass degree (without a major in computer science) followed by an appropriate graduate diploma (8)
4. A combination of qualifications and experience equivalent to (a), (b), or (c) above.

**Course Duration**

The course is offered on a full-time basis over two years or on an equivalent part-time basis.

For candidates given credit, the minimum duration must be at least the equivalent of one and a half years of full-time study following a three year degree.

**Course Structure**

To complete the Master of Science in Software Engineering requires the successful completion of six (6) core subjects, eight (8) elective subjects and a minor thesis, (2 subject equivalence), or six (6) core subjects, six (6) elective subjects and a major thesis, (4 subject equivalence).

<table>
<thead>
<tr>
<th>Core Subjects</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG5012 Managing Software Projects</td>
<td>15</td>
</tr>
<tr>
<td>SCM5800 Object Oriented Programming GD1</td>
<td>15</td>
</tr>
<tr>
<td>SCM5824 Object Oriented Programming GD2</td>
<td>15</td>
</tr>
<tr>
<td>SCM6822 Internet Programming</td>
<td>15</td>
</tr>
<tr>
<td>SCM6803 Software Engineering</td>
<td>15</td>
</tr>
<tr>
<td>SCM6804 Software Engineering</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elective Subjects</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCM5602 Quality Management &amp; Statistics</td>
<td>15</td>
</tr>
<tr>
<td>SCM5802 Information Systems</td>
<td>15</td>
</tr>
<tr>
<td>SCM5803 Data Structures and Programming</td>
<td>15</td>
</tr>
<tr>
<td>SCM5805 Communication and Networks</td>
<td>15</td>
</tr>
<tr>
<td>SCM5807 Advanced Information Systems</td>
<td>15</td>
</tr>
<tr>
<td>SCM5811 Operating Systems</td>
<td>15</td>
</tr>
</tbody>
</table>

**Progression Regulations**

The School's Academic Committees (Examiners' Meetings) will, at the end of each semester, consider the results and progress of all students enrolled in the course.

Progression is based on the following guidelines:

1. Where any subject must be repeated, enrolment in that subject must be at the first opportunity following the initial failure.
2. Students will not normally be allowed to enrol in any subject for which at least a P grade has not been attained in any of the pre-requisite subjects.

**Unsatisfactory Progress**

These regulations should be read in conjunction with Victoria University's Statute 6.4.1. – Unsatisfactory Progress. The following regulations apply to both full-time and part-time students.

1. The following shall constitute unsatisfactory progress:
   - (a) failure in at least 50% of the assessed subjects for which a student has enrolled in a semester of study,
   - (b) failure in any subject twice,
   - (c) transgression of a conditional enrolment stipulation and agreement.
2. Where a student's progress is unsatisfactory, the School's Academic Progress Committee may recommend the following:
   - (a) a restricted and conditional enrolment only be approved,
   - (b) exclusion from the course.
3. A student who wishes to appeal against the School's written recommendation is required to do so in accordance with the University's Statutes. The procedures to be followed in lodging a submission, hearing of submissions and communicating the results of hearings are set out in the University's Statutes.
4. Excluded students have no right of re-admission to the course from which they were excluded. Students who have been excluded may apply for re-admission not less than one calendar year from the date of exclusion. The student must provide, with his or her application, evidence of changed circumstances which significantly improve the applicant's likelihood of academic success.
Supplementary Assessment

(i) Supplementary assessment is not normally available in any subject or course of the School, other than for reasons of Special Consideration of illness or other cause.

(ii) In special circumstances the Head of School may authorise supplementary assessment in one or more subjects, for example:
- for major discipline subjects taken for the first time; and
- where the student's normal assessment was unsatisfactory in a small minority of subjects studied in a year, but had aggregate results significantly above pass level; and
- where a satisfactory supplementary result is a reasonable expectation of the student.

(iii) Supplementary assessment may be initiated by a subject Examination Board or the course School, where appropriate special grounds are seen to exist.

(iv) Supplementary assessment will require application, authorisation, and the payment of fees as defined by the School from time to time.

School of Life Sciences and Technology

Postgraduate Programs by Research

The School offers the following research degrees:
- Doctor of Philosophy
- Master of Science

The School's research activities are organised within the following major areas and students may select from a variety of research topics within these areas.

Chemical Research Unit

The Chemical Research Unit encompasses research activity in the general area of applied and analytical chemistry. The unit has major research interests in the following areas: The analysis of environmental pollutants by novel methods, the exploration of novel methods for the separation and analysis of trace constituents of commercial materials, metallic ores and biological substances. The development of novel instrumentation for atomic analysis and wine science, polymer stabilisation and degradation, landfill technology and waste minimisation.

The group has active research in the areas of inorganic chemistry and separation technology; biocatalysis in the synthesis of materials of commercial importance; occupational and environmental health and safety; packaging science and polymers; environmental chemistry and waste minimisation.

Biochemistry Unit

The Biochemistry group has major research interests in the following areas: muscle cell biochemistry; applications of biochemistry and related sciences in agriculture; horticulture and floriculture.

The Unit has a wide range of research projects in the above areas and attracts external funding from industry and Government agencies in support of its activities.

Biomedical Sciences

The Biomedical Sciences group (encompassing the two major research units of Exercise Metabolism and Muscle Physiology, and Reproduction and Family Health) has active research within two key research areas within the University: Medical Biotechnology; Health and the Environment; and Physical Activity, Rehabilitation and Health. Both these areas have a major focus on the use of state-of-the-art medical research techniques to investigate the functioning of the human body in both health and disease. Specific expertise includes reproductive physiology, molecular biology, cancer, genetics exercise, muscle metabolism and physiology, nutrition, lifestyle management and rehabilitation. This expertise provides the opportunity to learn a wide variety of valuable skills within a project tailored to satisfy students' interests.

Exercise Metabolism & Muscle Physiology Research Unit

Exercise is one of the most common human pursuits. From the weekend jogger to the professional athlete, the way in which our muscles produce and utilise energy is of the utmost importance. In addition, optimising skeletal muscle function and recovery from injury is also essential. The Exercise Metabolism & Muscle
Research into all facets of reproduction and perinatal development. The Biomedical Sciences group has a very strong background in development. This research unit is part of the Centre for Bioprocessing and Food Technology (CBFT) and links projects on women's health, implantation and embryo development, foetal development and parturition, and family health – in particular, drug dependency. The current areas of research include:

**Women's Health** from puberty to late post-menopause, has become an important and popular area of reproductive research. Studies in this area include: the role of steroid and peptide hormones in the regulation and function of menstrual and reproductive cycles, the interrelationships between physiological and psychological parameters in response to stressors on the regulation of the menstrual and reproductive cycles, and the effect of hormone replacement therapy and exercise on bone resorption and cardiovascular parameters in normal and diabetic postmenopausal women.

**Implantation and Embryo Development** Studies into implantation and embryo development include: the role of steroid hormones and other factors in the successful establishment of pregnancy; the development of the neural tube of the embryo; and the growth and differentiation of the placenta.

**Foetal Development and Parturition** By the time of birth, the foetus must have developed sufficiently to adapt to its extrauterine environment. Often, infants who are delivered prematurely have numerous medical problems which require very expensive intensive care. Studies into foetal development and prematurity include: growth and development of the foetal and neonatal lung; diabetes during pregnancy; rupture of foetal membranes during term and pre-term labour, the initiation of parturition; and parenting of premature infants.

**Premature Labour** affects some 11% of all pregnancies and this rate has not shown any major reduction over the last 15 years. The underlying cause for premature delivery are still uncertain although there is some evidence indicating that the premature rupture of foetal membranes may be an important factor in at least 40% of cases. This research program is proposed to characterise and monitor changes in existing and new genes in foetal membranes which are induced or suppressed during normal labour and to investigate the underlying causes of premature delivery in women. The long-term practical objective is to develop a test for predicting premature delivery in women and to develop a technique for prolonging pregnancy in women due to term.

**Foetal Programming of Adult Disease** is an exciting area of research investigating the factors and mechanisms during foetal development which pre-determine what adult diseases the foetus will develop in adult life. Research has shown strong relationships between small size at birth and the development of high blood pressure, cardiovascular disease and diabetes as an adult.

**Family Health** encompasses the health of infants and children as they mature through puberty to adolescents; of adults as they reproduce and mature to mid-life, and of older people. Health concerns are highlighted in each of these life cycle/reproductive stages. Studies in the area of family health include: parenting transition; the aetiology and consequences of perinatal depression; the nature of neurotransmitters in heroine addicts; the clinical management of drug dependence; the aetiology of schizophrenia; the use of proteins in saliva as markers to assess stress, pain and inflammation; and the assessment of gas pollutants in indoor environments.

**Human Health & Wellness** Incorporating diverse areas such as nutrition, psychology and the workplace, research undertaken within this area directly impacts on the health and well-being of the population at large.

**Lifestyle Management** (‘Wellness’) is a new area of research that examines individuals well-being and levels of health. Particular interests are community awareness of and attitudes towards, as well as the effects of; issues relating to the general health of the population, such as genetic engineering of food and immunisation.

**Natural Medicine** The use of drugs for medical purposes have replaced ‘home remedies’ and become commonplace in our everyday lives. However, many of these drugs are based on the same plant extracts that have been used for many years. Research will prove whether there is sound scientific basis to the use of these extracts, thus providing a realistic and healthy way to obtain the same effect without resorting to drug applications.

**Nutrition** We are what we eat is a simple statement. However, it is of extreme importance to our general health. Whether it is the intake for growing bodies in children or adolescents, or maintaining a healthy lifestyle in the elderly, nutrition is important to everyone in their day-to-day lives.

**Psychology** While much is known about the function of hormones and drugs within our bodies, little is known regarding their function on the mind. ‘Healthy mind – health body’ is a well known catchphrase, and illustrates the importance of investigating the effects of physiological stimuli on mood, stress and other psychological parameters.

**Work Environment** It is important for all workplaces to have a healthy environment. Research into the impact that environmental factors have on the health of an individual, and the implementation of health promotion programs, have great importance to all workplaces.

**Conservation Biology Group**

The Conservation Biology group has broad research interests, encompassing topics of interest to students with a focus on the conservation of species, their habitats, and the biological impacts of pollution and other aspects of global change such as the greenhouse effect. Research in this group also includes the ecology of aquatic (marine, estuarine and fresh water) and terrestrial (grasslands and wet forests) ecosystems, in some cases with an emphasis on practical implications for improved management practices. Primary areas of specialisation are: ecotoxicology of marine systems, ecology and management of exotic marine pests, environmental leadership, ecology of freshwater wetlands, palaeoecology and evolution of the Australian flora, invertebrate systematics and biogeography, and microbial ecology of aquatic systems.

Staff in the Conservation Biology group are recognised internationally in their areas of specialisation, and publish in...
The Food Science and Biotechnology Research Unit (FSBRU) is a recognised key research unit within the Faculty of Engineering and Science. The unit facilitates an integrated, multidisciplinary approach to research and brings together much of the Faculty’s resident expertise in the broad areas of microbiology, molecular biology, biochemistry, biotechnology and food science and technology, as well as incorporating the expertise of the Biocatalytic Synthesis Unit (BISUN). Specific expertise within the FSBRU includes protein chemistry, enzymology, genetic engineering, fermentation technology, food and anaerobic microbiology, analytical biochemistry and chemistry, sensory analysis, rheology and nutrition. This range of expertise is seen as a particular strength of the FSBRU, as complementary skills can be brought together to address both strategic and applied research activities and, as a result, the unit has attracted extensive financial support for its research programs.

The current areas of research interest in the FSBRU include:

- **Meat Science and Technology**: quality attributes of meat and meat products including: muscle metabolism and protein chemistry and influence on quality; activity and control of muscle proteases and their relationship to tenderness; role of pro- and anti-oxidants in lipid and haemoprotein oxidation in muscle and their effect on colour and odour; sensory and instrumental methods for quality assessment.

- **Grain Science and Processing Technology**: physical properties, chemical composition, enzymology and quality attributes including pigments in wheat; biochemical characteristics of starch as markers of wheat and noodle quality; functional properties and food applications of wheat and legumes and their components; baking and other processing technologies including including foods and steamed breads.

- **Microbiology, Dairy and Fermentation Technology**: probiotics and functional foods; food and industrial applications of lactic acid bacteria; yeast and other industrial fermentations including beer, pharmaceutical and specialty chemical production; isolation and characterisation of natural antimicrobials from native plants, herbs and spices; bacteriocins; applications of halophiles and their enzymes in biotechnology.

- **Food Biochemistry and Biochemical Analysis**: enzymatic and non-enzymatic deteriorative changes with respect to fruit and vegetable processing; enzyme analysis; immobilised enzyme and cell technologies; enzyme catalysis in supercritical and organic solvents; extractive and fractionation technologies, including membrane processing and supercritical fluid extraction of agricultural and food produce; NIR analysis of foods; odour analysis.

- **Molecular Biology**: application of protein and gene technologies including: molecular characterisation and utilisation of genes and proteins associated with tolerance to cell stressors such as metal ions, alcohol and heat, particularly in relation to microorganisms utilised by the food and fermentation industries; use of molecular markers and DNA fingerprinting for identification of organisms; molecular characterisation of genes and proteins associated with starch biosynthetic pathways and associated grain quality and functional properties.

**Resource Management**: loss monitoring, waste minimisation and utilisation; whey utilisation; bioconversion of agricultural and food industry by-products and wastes including lignocellulosic wastes; bioremediation.

All of the above research activities are supported by world class facilities and highly qualified research staff.

The School has a wide range of research projects in the above areas and has attracted good financial support for its programs. Much of the research attracts industry funding on a collaborative or contractual basis, however there is broad scope to develop projects of a fundamental nature as well. The School works closely with the University’s Centre for Bioprocessing and Food Technology and with external organisations including Food Science Australia and Agrifood Technology.

### Coursework Programs

The School offers the following postgraduate coursework programs:

1. **Graduate Diploma in Environmental Management**
2. **Master of Science**

**Course Code**: SGEM

**Course Objectives**

The course is aimed at producing graduates with a good understanding of contemporary environmental problems and solutions. A mixture of coursework will be provided including solid waste management, water pollution control, environmental law, and occupational health and safety.

**Course Duration**

The course will be offered in full-time (one year) and part-time (two years) modes.

**Admission Requirements**

The normal entry requirement is a relevant degree or diploma, but special admission may be granted for applicants without the required qualifications but with a number of years of relevant industrial experience.
Course Structure
The structure of the course is as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS5100</td>
<td>Research Methodology</td>
<td>6</td>
</tr>
<tr>
<td>SCS5101</td>
<td>Principles of Environmental Science</td>
<td>12</td>
</tr>
<tr>
<td>SCS5112</td>
<td>Principles of Environmental Management</td>
<td>12</td>
</tr>
<tr>
<td>SCS5121</td>
<td>Environmental Law and Standards 1</td>
<td>6</td>
</tr>
<tr>
<td>SCS5132</td>
<td>Environmental Law and Standards 2</td>
<td>12</td>
</tr>
<tr>
<td>SCS5141</td>
<td>Air Quality Management</td>
<td>12</td>
</tr>
<tr>
<td>SCS5152</td>
<td>Liquid Waste Management</td>
<td>12</td>
</tr>
<tr>
<td>SCS5161</td>
<td>Occupational and Public Health</td>
<td>12</td>
</tr>
<tr>
<td>SCS5172</td>
<td>Solid Waste Management</td>
<td>12</td>
</tr>
<tr>
<td>SCS5181</td>
<td>Water Pollution Monitoring</td>
<td>12</td>
</tr>
<tr>
<td>SCS5192</td>
<td>Clean Production Technology and Waste Minimisation</td>
<td>12</td>
</tr>
</tbody>
</table>

Assessment
Assessment will consist of assignments, field reports, class presentations and end-of-semester examinations. The use of electronic calculators and electronic storage devices is not permitted in any examination unless specified in the subject guide for that subject and/or in the examination paper for that subject.

Admission Requirements
The normal entry requirement is a four year Bachelor of Science Degree or a 3 year Bachelor of Science Degree with relevant experience.

Master of Science in Environmental Management

Course Code: SNIEM

Course Objectives
The Masters program is designed to enhance the students’ range of knowledge in environmental waste management, to provide additional skills in research and development and to enable a focusing of practical skills into a specific research area which may be related to the candidates’ current employment.

Course Duration and Structure
The Masters program consists of a coursework component which is equivalent to the Graduate Diploma (12 months full-time) and a research project component (6 months full-time). Both components are available on a part-time basis.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS6000</td>
<td>Thesis</td>
<td>120</td>
</tr>
<tr>
<td>SCS6010</td>
<td>Thesis part-time (60 per semester)</td>
<td></td>
</tr>
<tr>
<td>SCS6020</td>
<td>Thesis part-time (30 per semester)</td>
<td></td>
</tr>
</tbody>
</table>

Admission Requirements
Candidates who possess the Graduate Diploma in Environmental Management may be eligible for direct entry into the research component of the Masters program.

Assessment
Assessment will consist of assignments, field-trip reports, class presentations, end-of-semester examinations and a research project report.

Master of Science - Food Science and Technology

Course Code: SMFS

Course Objectives
The course is designed to provide professional training in food science and technology for graduates in science, applied science, engineering, agricultural and other related disciplines who may or may not have had previous formal training in this area.

Course Duration
The course requires the successful completion of a program of compulsory and elective subjects, totalling a minimum of 120 credit points.

Admission Requirements
Applicants who do not meet these qualifications may be admitted after the completion of an approved course of pre-study, or on submission of such other evidence of academic, professional or vocational attainment to indicate that the applicant possesses the educational preparation and capacity to pursue the course.
Elective Subjects

SBF6710 Food Analysis 10
SBF6721 Fruit and Vegetable Science and Technology 20
SBF6722 Grain Science and Technology 20
SBF6723 Muscle Food Science and Technology 20
SBF6724 Dairy Science and Technology 20
SBF6740 Special Topics in Food Technology 10
SBF6745 Food Product Development 10
SBF6910 Minor Project 20
SBF6920 Major Project 40
SCM3614 Experimental Design 10

Appropriate elective subjects may be selected from those offered by the Faculty of Engineering and Science or by other Faculties in the University subject to approval by the Head of the School of Life Sciences and Technology.
School of the Built Environment

Courses Offered
The School of the Built Environment offers postgraduate courses leading to the award of:
- Graduate Certificate in Project Management
- Graduate Diploma in Project Management
- Master of Engineering (Project Management) (coursework program, based on the above graduate diplomas)
- Master of Engineering (Research)
- Doctor of Philosophy

Research Activities
Master of Engineering (Research) and Doctor of Philosophy degrees are currently being awarded in the areas of Civil and Building Engineering and Mechanical Engineering. A brief description of the research activities follows. The School has a collaboration with a number of industrial and government organisations in these activities.

The area of Civil and Building Engineering carries out a wide range of research and development activities in the general areas of the built and natural environments. Some of the specific areas include:

Building Services
Work is being undertaken to help engineers design more efficient water supply distribution systems in commercial and residential buildings.

Research is also under way aimed at helping designers and owners of buildings to select the most energy efficient air conditioning systems.

A new air conditioner has been developed that uses solar energy to cool stored grain in silos. This device enables grains to be stored for prolonged periods of time without the use of toxic chemical pesticides.

Environmental Management
Research work is being carried out aimed at reducing the erosion of river banks and improving water quality from road construction sites. The area has a strong interest in wastewater treatment and recycling. Research is being undertaken with the aim of controlling the pollution of groundwater. Practical ways of reducing the use of materials in a wide range of manufactured artefacts are also being developed.

Fire Modelling
Researchers in the area of Civil and Building Engineering work closely with those in the Centre for Environmental Safety and Research on modelling the spread of fires and the effects of fires on building structures.

Project Management
Research is being carried out on the new area of Project Risk Management and Life Cycle Cost Optimisation. A group of researchers work on the following areas:
- Risk Analysis for Construction Projects
- Quality Management for Construction
- ‘A case study of a Project Dispute’
- Client/Project Manager Agreement
- Constructability Comparisons
- Development of Feasibility Model
- Quality Performance Measurement
- Evaluation of BOOT/BOT Project Delivery Systems
- Computer Simulation of Construction Site Management

Geotechnics
A research project aimed at developing tests for geotechnical fabrics used to improve the performance of foundations and prevent erosion is helping Australia to stay at the forefront of this rapidly growing industry.

Structural Engineering
Research is being carried out on new and efficient methods of optimising the design of structures that range from bicycles to large buildings. A group of researchers works on the design of tall buildings, and specifically those subject to earthquake forces.

The area of Mechanical Engineering focuses its research activities on the areas of research classified in the University's Research Management Plan as either Major Research Areas, Strategic Research Areas or Complementary Research Activities. With each of these areas the specific topics currently being pursued by postgraduate students are many and varied. Typical research topics include:
- an experiment study of convective heat and mass transfer in bulk storage of respiring fruit and vegetables;
- analysis of vibration reduction via structural modification;
- prediction of vibrations from road profile in transportation of packages;
- dynamic characteristics of aerial optical fibre cables subjected to wind loading;
- diagnosis of local damage in structures using measured vibration data;
- numerical modeling and experimental study of fire spread through external windows in buildings;
- water storage using ocean wave energy;
- modelling of scavenging process in a two stroke I.C. engine;
- a heat transfer model of the refuelling process for natural gas vehicles;
- chatter control in turning;
- CFD studies and turbulence modelling;
- utilisation of banana fibres in composite materials;
- evaluation of the performance of corrugated shipping containers: virgin versus recycled liners;
- evaluation of a reusable engine packaging system;
- optimal dynamic design of gear trains using modal analysis approach;
- bruise/modelling of agricultural products.

Admission Requirements
As indicated above, a wide range of challenging research projects are available leading to Master of Engineering by Research and Doctor of Philosophy degrees. For admission, high honours results in a recognised undergraduate course, or an equivalent qualification, is required. Initial enquiries regarding eligibility for admission and research projects should be directed to the Postgraduate Co-ordinator at (03) 9688 4227.

Academic Progression Guidelines and Unsatisfactory Progress
Normal progress through a course requires a student to complete any defined course year within one year of equivalent full-time enrolment. When all subjects in a course year are passed, a stage grading of 'year completed' may be given.

Any of the following may be considered to constitute unsatisfactory progress by a student:
- failure in any subject or unit for the second time;
• failure to complete the course within any maximum period defined by University Statute;
• failure to meet a conditional enrolment agreement.

As otherwise defined by University Statute, and subject to being invited to show cause, a student making unsatisfactory progress will normally be recommended for exclusion from the course.

Graduate Certificate in Project Management

Course Code: ETPM

The School of the Built Environment conducts the Graduate Diploma in Project Management and the Masters of Engineering in Project Management.

Currently, major initiative are in progress which will require professionals to practice only in certain areas based on their qualifications and experience. This is particularly the case in the field of project management.

Course Objectives

The course provides opportunities for professional people to:
(a) develop advanced technical skills in a specialist discipline;
(b) develop their understanding of legislation and management relevant to their employment;
(c) develop ability to plan, co-ordinate and complete complex projects;
(d) apply and extend research and reporting skills and gain specialist knowledge of a topic relevant to their employment.

The course will be directed at registered building surveyors and other building practitioners such as architects, engineers, quantity surveyors, etc., with at least one year of relevant professional experience. Other professions directly affected by performance regulations will be encouraged to participate.

The aims of the course are to:
• introduce the concepts and alternative acceptable frameworks for performance based codes, with particular, but not exclusive, emphasis given to project management practices;
• provide building engineering and allied professions with the appropriate knowledge and skills necessary for the assessment and application of performance-based project management practices;
• develop an appreciation of the legal, statutory and design integrity requirements and the need for compliance of the design assumptions throughout the operational life of the building or facility;
• develop a recognition of the desirability of undertaking additional courses to further upgrade skills and expertise.

Admission Requirements

Qualifications accepted are a degree or diploma or associate diploma in Engineering or Building or Quantity Surveying or Architecture or Construction from a University or College of Advanced Education or Technical and Further Education in Australia.

Applicants with other qualifications deemed to be equivalent to the degree, diploma or associate diploma may be admitted.

Applicants must have at least one year of relevant experience in the design, construction and/or management of building and engineering projects before being admitted to the course.

The formal qualification requirements may be waived in exceptional circumstances.

Course Duration

The course will be delivered as follows:
• Each subject will be presented as a three-hour workshop session one evening per week for one semester.
• Two subjects will be presented each semester.

The course will be presented over two semesters during a 12 month period.

Course Structure

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Credit points</th>
<th>Semester</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>One</td>
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<tr>
<td>Project Management subjects</td>
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<tr>
<td>Core Subjects</td>
<td></td>
<td></td>
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<tr>
<td>ECP5600 Project Management Fundamentals</td>
<td>15</td>
<td></td>
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<tr>
<td>ECP5610 Project Management Planning and Control</td>
<td>-</td>
<td>15</td>
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<tr>
<td>Elective Subjects</td>
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<tr>
<td>ECP5620 Project Management and Contracts</td>
<td>-</td>
<td>15</td>
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<tr>
<td>ECP5705 Project Management and Information Technology</td>
<td>-</td>
<td>15</td>
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<tr>
<td>ECP5715 Property Development Analysis</td>
<td>-</td>
<td>15</td>
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<tr>
<td>ECP5725 Project Construction Management</td>
<td>15</td>
<td>-</td>
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<tr>
<td>ECP5735 Building Life Cycle Costing</td>
<td>-</td>
<td>15</td>
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<tr>
<td>ECP5745 Building Regulatory Management</td>
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<td>15</td>
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<tr>
<td>plus approved subjects currently available at Victoria University, Footscray Campus, such as:</td>
<td></td>
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<tr>
<td>Computer Science</td>
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<tr>
<td>SCM5404 Financial Decision Support Systems</td>
<td>15</td>
<td></td>
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<tr>
<td>SCM5801 Introduction to Computer Science</td>
<td>15</td>
<td></td>
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<tr>
<td>SCM5802 Information Systems</td>
<td>15</td>
<td></td>
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<tr>
<td>Decision Support Science</td>
<td></td>
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<tr>
<td>SCM5602 Quality Management and Statistics</td>
<td>15</td>
<td></td>
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<tr>
<td>SCM5901 Introduction to Decision Support Systems</td>
<td>15</td>
<td></td>
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<tr>
<td>Business Management</td>
<td></td>
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<tr>
<td>BAO5735 Advanced Forecasting, Planning and Control</td>
<td>15</td>
<td></td>
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<tr>
<td>BLO5513Law Employment</td>
<td>15</td>
<td></td>
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<tr>
<td>BLO5537 Business Law</td>
<td>15</td>
<td></td>
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<tr>
<td>BLO 6502 Law Management</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

195
Industrial Relations
BAO5544 Human Resource Economics 15
BMO5545 Comparative Industrial Relations Systems 15
BMO5537 Topics in Employee Relations Management 15
BMO5589 Industrial Relations and the Building Industry 15

The availability of electives from other areas/schools depends on staff resources and enrolments.

Graduate Diploma in Project Management

Course Code: EGCP

Project Management
The Graduate Diploma in Project Management at Victoria University was the first such course set up in Victoria, and only the second in Australia. Throughout all its first decade it has been an industry leader. When the first Graduate Diploma in Project Management began in 1984, the focus was on the narrowly technical. Now, the course is concerned with the human and social perspective; with building teams that work well together and with placing the management of the project firmly within the wider environment.

Course Objectives
The course is designed specifically to meet the needs of current or potential managers in the building construction and related industries. It will equip the professionals already in the industry with advanced principles and techniques of project management to enable them to assume the role of project manager and/or become effective members of project management teams.

Admission Requirements
Applicants should have a degree or diploma in architecture, building, construction, engineering, quantity surveying, or other relevant discipline and at least two years of experience or current employment at professional level in the relevant field. Suitable proof these will be required prior to enrolment.

Other qualifications may be considered acceptable and the formal qualification requirements may be waived in exceptional circumstances.

In addition, all applicants applying as full-fee paying international students must provide evidence of proficiency in the English language:
IELTS – an overall band score of 6+, subject to individual profile; or
TOEFL – a score of 550+, and a Test of Written English score of 5+.

Course Duration
The course is offered on a full-time basis over one year for full-fee paying international students or on a part-time basis over a minimum of two years.

Course Structure
The course consists of eight subjects as follows: four ‘core’ subjects to develop a basic knowledge in fundamentals of project management, project planning and control, contract law and industrial relations in the building and construction industry; four ‘electives’ are selected to achieve a better understanding and working knowledge of all disciplines involved in management of a project. Students must complete 120 credit points.

Credit points
Semester

Year 1
Compulsory core subjects
BMO5589 Industrial Relations and the Building Industry 15
ECP5600 Project Management Fundamentals 15
ECP5610 Project Management Planning and Control 15
ECP5620 Project Management and Contracts 15

Elective subjects
In total, four electives are selected from the following.
ECP5705 Project Management and Information Technology 15
ECP5715 Property Development Analysis 15
ECP5725 Project Management 15
ECP5735 Building Life Cycle Costing 15
ECP5745 Building Regulatory Management 15
plus approved subjects currently available at Victoria University, Footscray Park Campus. These approved subjects may include:

Credit points (semesters to be advised)

Computer Science
SCM5404 Financial Decision Support Systems 15
SCM5801 Introduction to Computer Science Systems 15

Decision Support Science
SCM5602 Quality Management and Statistics 15
SCM5901 Introduction to Decision Support Systems 15

The availability of electives from other departments depends on staff resources and enrolments.

Assessment
Assessment will be by projects, submission and examination.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.
Master of Engineering (Project Management) (Coursework)

Course Code: EMCC

Course Objectives
In the 1990s, government, industry and individuals increasingly recognised the Masters degree as an important benchmark measure of vocational and professional training. The Master of Engineering (Project Management) provides opportunities for professional engineers and managers to achieve high level training in contemporary engineering methods. The course gives students a large choice of both technical and managerial subjects, and it enables professional people to:

• develop advanced technical skills in a specialist discipline;
• develop their understanding of legislation and management relevant to their employment;
• develop ability to plan, co-ordinate and complete complex projects;
• apply and extend research and reporting skills and gain specialist knowledge of a topic relevant to their employment.

Two of the main coursework streams are based on the Building Project Management and Building Services Engineering Graduate Diplomas.

Admission Requirements
An honours degree in a relevant discipline and relevant work experience will normally be required to enter the course. Advanced entry may be approved for students who have completed at least four subjects of a relevant Graduate Diploma with an upper second class honours average.

In addition, all applicants applying as full-fee paying international students must provide evidence of proficiency in the English language:

IELTS – an overall band score of 6+, subject to individual profile; or
TOEFL – a score of 550+, and a Test of Written English (TWE) score of 5+.

Course Duration
The course is offered over one-and-a-half years on a full-time basis or over three years on a part-time basis. Students must complete 180 credit points.

Course Structure
Candidates must complete to a satisfactory standard eight approved subjects of three hours per week Class Contact selected from approved Graduate Diplomas of Engineering, or any other postgraduate subject deemed equivalent by the Course Co-ordinator, plus a minor thesis of 12 hours per week for one semester or six hours per week for two semesters, or ten subjects of three hours per week Class Contact selected from approved Graduate Diplomas of Engineering plus a thesis/project of six hours per week for one semester or three hours per week for two semesters.

The Masters Degree structure is:

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester</th>
<th>Credit points</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
<td>60</td>
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<tr>
<td>4 Graduate Diploma subjects</td>
<td></td>
<td>60</td>
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</tbody>
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or part-time over 2 or 3 years

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Semester</th>
<th>Credit points</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
<td>60</td>
</tr>
<tr>
<td>Ecc8000</td>
<td>Research Thesis (full-time)</td>
<td>60</td>
</tr>
<tr>
<td>Ecc8010</td>
<td>Research Thesis (part-time)</td>
<td>30</td>
</tr>
<tr>
<td>Ecc8040</td>
<td>Project work (full-time)</td>
<td>30</td>
</tr>
<tr>
<td>2 Graduate Diploma subjects (full-time)</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Ecc8050</td>
<td>Project work (part-time)</td>
<td>15</td>
</tr>
<tr>
<td>2 Graduate Diploma subjects</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

The Masters Degree program uses subjects of the existing Graduate Diplomas within the area for the coursework content. Additionally, students who complete other Graduate Diploma courses with Honours averages may be admitted to the Degree with advanced standing.

Students may choose from the following Graduate Diploma subjects:

BLO5537 — Business Law
BLO5513 — Law of Employment
BAO5735 — Advanced Forecasting, Planning and Control
BAO5544 — Human Resource Economics
BLO6502 — Law for Management
BM05545 — Comparative Industrial Relations Systems
BM05537 — Topics in Employee Relations Management
BM05589 — Industrial Relations and the Building Industry
ECP5600 — Project Management Fundamentals
ECP5610 — Project Management Planning and Control
ECP5620 — Project Management and Contracts
ECP5705 — Project Management and Information Technology
ECP5715 — Property Development Analysis
ECP5725 — Project Construction Management
ECP5735 — Building Life Cycle Costing
ECP5745 — Building Regulatory Management
SCM5404 — Financial Decisions Support Systems
SCM5602 — Quality Management and Statistics
SCM5801 — Introduction to Computer Science
SCM5802 — Information Systems
SCM5901 — Introduction to Decision Support Systems

Assessment
Assessment will be by a combination of written assignments, oral presentations, case studies, written examination and by the satisfactory completion of a thesis. Except in special circumstances supplementary assessment for subjects taught by the School of the Built Environment will not be offered.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.
Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.
BAO5735 ADVANCED FORECASTING, PLANNING AND CONTROL

Campus City Flinders
Prerequisite(s) Nil.
Content This subject aims to study topics applicable to the collection, storage and analysis of data, and to the presentation of the information to other people. This subject includes the following topics: selection of data and data analysis; statistics and forecasting; management accounting topics including budgeting; decision support and other planning systems; control of computer systems; presentation and reporting of information to management.
Required Reading To be advised by lecturer.
Class Contact Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.
Assessment Assignments, 50%; examination, 50%. Students are expected to satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BE05344 HUMAN RESOURCE ECONOMICS

Campus City Flinders
Prerequisite(s) Nil.
Content This subject introduces students to the economic principles of the allocation of human resources within organisations and the wider economy. It will equip them with skills necessary to analyse the likely outcomes of specific human resource decisions. Topics include: supply and demand for labour and labour markets; disadvantaged labour market groups; the impact of unions on wages; payment systems and productivity; and the impact of wage fixing systems on the broader economy.
Required Reading To be advised by lecturer.
Class Contact Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.
Assessment Class paper, 30%; research paper, 30%; test, 40%. Students are expected to satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BE06400 RETAIL MANAGEMENT STRATEGIES (ENGINEERING AND SCIENCE SERVICE SUBJECT)

Campus Werribee
Prerequisite(s) Nil.
Content This subject provides an analysis of the retail exchange process and the critical concepts and issues involved in retail management. Areas studied include the retail exchange process and retail competition; retailers in the marketing channels; product life cycles, packaging design and manufacture, and the interrelationship with consumer, industrial and retail strategies; the changing retail environment; and the design of retail marketing and financial strategies.
Required Reading To be advised by lecturer.
Class Contact Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.
Assessment Assignment 1 (1500 words), 40%; Assignment 2 (2500 words), 60%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

BHO6505 MARKETING MANAGEMENT

Campus City Flinders, Kuala Lumpur, Singapore, China, Bangladesh.
Prerequisite(s) Nil.
Content Upon completion of the subject, students would be able to understand the Marketing Management Process, develop essential skills necessary in a Marketing Manager's job, appraise an organisation's performance in a competitive marketing environment (foreign and domestic), formulate and implement marketing mix strategies in consumer, industrial and service markets, solve problems and improve their abilities in making sound decisions based upon available market information and appreciate the applications of marketing principles to Service Sector and International business decision making.
Required Reading To be advised by lecturer.
Class Contact Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.
Assessment Assignment, 25%; research project of a student's own choice, 25%; examination, 50%. In order to be awarded a pass in this subject, students must satisfactorily complete each component of the assessment. Supplementary assessment will not be made available.

BLO5513 LAW OF EMPLOYMENT

Campus City Flinders
Prerequisite(s) Nil.
Content The aims of the subject are: to assist students to become familiar with aspects of industrial law required for the vocational aspects; to provide students with an understanding of the skills necessary to deal with legal problems which may arise in the industrial arena. The subject includes contract of employment; termination of employment; worker's safety; and equal opportunity law.
Required Reading To be advised by the lecturer.
Class Contact Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.
Assessment Assignment, 25%; research project of a student's own choice, 25%; examination, 50%. In order to be awarded a pass in this subject, students must satisfactorily complete each component of the assessment. Supplementary assessment will not be made available.
workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**
Two case studies, 50% each. Students must satisfactorily complete each part of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

### BLO3377 BUSINESS LAW

**Course**
City Flinders.

**Prerequisite(s)**
Nil.

**Content**
This subject aims to provide students with a working knowledge and overview of the legal system – students will understand and be able to speak, write and read in the language and technology of business law; provide students with an appreciation of contract and tort law issues – students in their working life should be able to avoid problem situations, and possibly be more aware of the need for reform in particular areas; and, to enable students to learn the techniques of finding the appropriate law when necessary to apply law to a contract problem. The subject includes: an introduction to the law, an examination of the litigation process, onus of proof, the sources of law in Australia, precedent, the court system and tribunals in Victoria; criminal and the law of tort as it relates to business; a study of the law of negligence with particular emphasis on professional liability for negligent statements and advice; the definition of a contract and the information of contractual terms in the contract; an examination of the different remedies available under the law; the interaction of tort law with contract; statutory schemes relating to contract with particular terms in the contract; an examination of the different remedies available under the law; the interaction of tort law with contract; statutory schemes relating to contract with particular reference to the Trades Practices Act 1974 (Cth) and to the Goods (Sales and Leases) Act 1981 (Vic); discharge of contract by different occurrences such as friction, unilateral agreement, illegality and mistake.

**Required Reading**
To be advised by lecturer.

**Class Contact**
Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**
Mid semester test, 20%; essay, 20%; final examination, 60%. Students must satisfactorily complete each part of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

### BLO6502 LAW FOR MANAGEMENT

**Course**
City Flinders. Kuala Lumpur, Singapore, China, Bangladesh.

**Prerequisite(s)**
Nil.

**Content**
An introduction to law, including historical origins of our legal system, the sources of law, the doctrine of precedent and the court hierarchy, the adversary system. Also examination of types of precedent, history of tort of negligence and the rules of statutory interpretation and the identification of the essential elements in the formation of a contract. Examination of the elements of contract including the distinction between a condition, a warranty and an immovable term. Examination of Misrepresentation, Duress, Undue influence, Unconscionability. Consideration of the concept of a tort and the difference between the types of tort. Different types of business structures; sole traders; partnerships, joint ventures; incorporated and unincorporated associations and company law; a survey of the legal rules regulating administrative action.

**Required Reading**

### Class Contact
Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**
Assignment, 40%; class participation, 10%; examination, 50%. In order to be awarded a pass in this subject, students must satisfactorily complete each component of the assessment. Supplementary assessment will not be available.

### BMO3377 TOPICS IN EMPLOYEE RELATIONS MANAGEMENT

**Course**
City Flinders.

**Prerequisite(s)**
Nil.

**Content**
The subject aims to provide students with an opportunity to study in School, issues of contemporary importance in industrial relations. On completion of the subject, students should be able to critically examine issues and identify their impact on industrial relations and examine the change process as well as understanding the options for dealing with change. It will include topics such as new technology, industrial democracy, women and the labour market, occupational health and safety, and contemporary reforms to organisations.

**Required Reading**
To be advised by lecturer.

**Recommended Reading**

**Class Contact**
Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**
Two class papers, 50%; research essay, 50%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

### BMO3588 INDUSTRIAL RELATIONS FOR MUNICIPAL ENGINEERS (ENGINEERING SERVICE SUBJECT)

**Course**
City Flinders.

**Prerequisite(s)**
Nil.

**Content**
An introduction to industrial relations and a study of policy questions and techniques associated with the practice of industrial relations, specifically in the area of local government. Topics covered include the industrial relations framework, the parties to industrial relations, negotiation principals, conflict resolution, industrial awards, legal aspects of employment and contemporary industrial relations issues.

**Required Reading**
To be advised by lecturer.

**Class Contact**
Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

**Assessment**
Essay, 30%; class assignments, 70%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject. Supplementary assessment will not be available.

### BMO3559 INDUSTRIAL RELATIONS AND THE BUILDING INDUSTRY (ENGINEERING SERVICE SUBJECT)

**Course**
City Flinders.

**Prerequisite(s)**
Nil.

**Content**
An introduction to industrial relations and a study of policy questions and techniques associated with the practice of industrial relations, specifically in the building industry. Topics covered include the industrial relations framework, the parties to industrial relations, negotiation principals, conflict resolution, industrial awards, legal aspects of employment and contemporary industrial relations issues.

Class Contact Equivalent to 39 hours per semester normally to be delivered as a combination of lecture, seminar, tutorial and/or workshop or a delivery mode as approved by the Faculty of Business and Law. Subject equal to 15 credit points.

Assessment Essay, 30%; class assignment and test 70%. Students must satisfactorily complete each component of the assessment to gain a pass in the subject Supplementary assessment will not be available.

ECC8000 RESEARCH THESIS (FULL-TIME)

Campus Footscray Park

Prerequisite(s) Nil.

Content The subject will enable students to: identify a research problem and critically review the relevant literature; determine appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the research undertaken, both clearly and accurately in a written thesis. The research topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The thesis will normally be from 15,000 to 25,000 words. It will report on independently conducted research which demonstrates the student's ability to clearly define a problem, to undertake a detailed literature search and review the literature on the topic area. The student shall also demonstrate both the ability to develop and/or apply models to study the problem and good data selection, collection and analysis skills. Students will normally be supervised by an academic member of the Department of Civil and Building Engineering and by a joint supervisor external to the Department. The external supervisor will be an academic from another Department/School at Victoria University or from another institution or an industry practitioner.

Required Reading To be advised by lecturer.

Class Contact Six hours per week for two semesters.

Assessment Before commencing actual research, students must complete, to the satisfaction of the research supervisor, a paper critically reviewing the literature and providing a clear outline of the proposed research methodology to complete the thesis. The final thesis will be assessed by two examiners with expertise in the area of the research. These examiners may be internal or external to the School or the institution and will not include the supervisors. Students may be asked to present themselves for oral or written examination by these examiners, at the examiners' discretion. Each examiner will independently recommend one of the following outcomes to his/her assessment of the thesis: (a) pass without further examinations; (b) pass, subject to corrections to the satisfaction of the School's Research and Graduate Studies Committee; (c) candidate to pass a written or oral examination to pass thesis; (d) deferred for resubmission after major revision; (e) fail. In the event that there is disagreement between the examiners, a third examiner will be appointed.

ECC8050 PROJECT WORK (PART-TIME)

Campus Footscray Park

Prerequisite(s) Nil.

Content The subject enables students to: identify a project problem and critically review relevant literature; determine appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the research undertaken, both clearly and accurately in a written report. The report topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The report will normally be from 8000 to 15,000 words. It will detail the problem, relevant literature, analysis conducted, conclusions and recommendations. Students will be supervised by an academic member of staff and where appropriate by a supervisor from another institution or from industry.

Required Reading To be advised by lecturer.

Class Contact Twelve hours per week for one semester.

Assessment will be by project work and report.

ECC8040 PROJECT WORK (FULL-TIME)

Campus Footscray Park

Prerequisite(s) Nil.

Content The subject enables students to: identify a project problem and critically review relevant literature; determine appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the research undertaken, both clearly and accurately in a written report. The report topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The report will normally be from 8000 to 15,000 words. It will detail the problem, relevant literature, analysis conducted, conclusions and recommendations. Students will be supervised by an academic member of staff and where appropriate by a supervisor from another institution or from industry.

Required Reading To be advised by lecturer.

Class Contact Six hours per week for one semester.

Assessment Assessment will be by project work and report.
appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the project undertaken, both clearly and accurately in a written report. The report topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The report will normally be from 8000 to 15,000 words. It will detail the problem, relevant literature, analysis conducted, conclusions and recommendations. Students will be supervised by an academic member of staff and where appropriate by a supervisor from another institution or from industry.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for two semesters.

Assessment Assessment will be by project work and report.

ECP5600 PROJECT MANAGEMENT FUNDAMENTALS

Campus Footscray Park

Prerequisite(s) Nil.

Content The subject will introduce and define project management as applicable to the concept, development design and documentation, construction and maintenance, of buildings and to introduce participants to Project Management – the emerging profession. The subject examines the following topics.


Building process in public sector; past history and current trends in management of public projects. Comparison of performance public/private sectors; overview of future developments. The interrelationship between owner, developer, financial sources, designers and contractors. Government body as owner/developer; invest financiers as owner/users. Government control and regulations applicable to buildings. (New BCA.) Role and task of functional activities of project managers: setting of project objectives; feasibility analysis; setting of budget; control of contract time and quality; risk apportionment between various parties. Design to user requirements: planning for life-cycle of the facility; management of small to medium size projects; role descriptions of project manager, architect, consultants and owners, Environmental and social constraints. Preparation EIS for building development project. Case studies illustrating the various aspects of project management.

Required Reading To be advised by lecturer.

Recommended Reading


Class Contact Three hours per week for one semester.

Assessment Assignments, 20%; group project, 40%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

ECP5640 PROJECT MANAGEMENT PLANNING AND CONTROL

Campus Footscray Park

Prerequisite(s) ECP5600 Project Management Fundamentals (normally).

Content The subject will review the development process of a project from its inception through to feasibility and go-ahead decision; detail design documentation, construction commissioning and life cycle planning; evaluate the role and function of Project Management in this process; explain the purpose and to detail the theoretical basis of various techniques used for planning and managing the building process. The subject content includes: Systems approach to project planning; basic principles and theory of systems analysis; current trends in community project planning. Overview of subject and introduction to project. Management of a ‘Public Interest Project’. Preparation of financial feasibility of a building project: factors involved, issues to be considered at concept stage; introduction of a case study. Capital decision making for project managers; cost concepts and cost factors. Project control and cost planning at feasibility and design stage. Cost versus quality assurance. Project control during construction phase; breakdown of the project for estimating, budgeting and financial control; project term planning; networks and other scheduling techniques; resource levelling; line of balance concepts. Project cost planning and control in public sector; pre-construction cost control, construction cost control; N.P.W.C. cost control method: data support system to cover – contingency, indexation and methods of monitoring and reporting. Project team planning: duties and responsibilities of the project manager. Planning techniques for high rise building construction, multi-activity chart; principles of production engineering applied to repetitive processes in building construction; special problems of high-rise design and construction. Principles of decision analysis; review of mathematical theory; application to decision process under uncertainty. Value engineering concepts and its application to building design and construction; application of value analysis in project management. Role and responsibilities of client’s member on PM team; risk sharing at various stages of project between the parties involved in the process; role of PM in client awareness of risks and rewards.

Required Reading To be advised by lecturer.

ECMP520 PROJECT MANAGEMENT AND CONTRACTS

Campus Footscray Park

Prerequisite(s) ECP5600 Project Management Fundamentals (normally).


Required Reading To be advised by lecturer.


ECMP505 PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY

Campus Footscray Park

Prerequisite(s) Nil.

Content This subject will develop students' skills in the use of a number of software packages in the areas of General Project Management Information Systems and Specialised Project Management Information Systems. Students will gain appreciation of where computer packages can aid the project management process for feasibility and sensitivity analysis, planning and monitoring and information processing and decision support functions. The subject content includes the decision to computerise, hardware and software procurement considerations, current computer usage in this industry; overview of computer hardware and software, current computer trends; overview of Project Management Information Systems (spreadsheet/ financial modelling, planning and resource control, Data Base Management Systems (DBMS), and 4th Generation Languages (4GLs)); detailed investigation of at least two software packages from item above; managing change and introduction of computers, the machine/human interface, training and installation problems and opportunities simulation modelling as an alternative to traditional, activity based management systems; trends in CAD and its impact on Project Management; quality control and Project Management Information Systems.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester.

Assessment Individual assignment, 15% group assignment presentation, 5% report, 40% examination, 40% Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

ECMP715 PROPERTY DEVELOPMENT ANALYSIS

Campus Footscray Park

Prerequisite(s) Nil.

Content The subject will develop skills and techniques to assess and manage building property and to appreciate the role and objectives of developers and property managers. Subject content examines Management of property in the economy: An overview: typology of property relationship between project management and Property Management. Feasibility and economic issues in development of property: Elements of a property development feasibility study. Parameters of property investment. Decisions including investigation of at least two software packages in the areas of General Project Management Information Systems and Specialised Project Management Information Systems. Students will gain appreciation of where computer packages can aid the project management process for feasibility and sensitivity analysis, planning and monitoring and information processing and decision support functions. The subject content includes the decision to computerise, hardware and software procurement considerations, current computer usage in this industry; overview of computer hardware and software, current computer trends; overview of Project Management Information Systems (spreadsheet/ financial modelling, planning and resource control, Data Base Management Systems (DBMS), and 4th Generation Languages (4GLs)); detailed investigation of at least two software packages from item above; managing change and introduction of computers, the machine/human interface, training and installation problems and opportunities simulation modelling as an alternative to traditional, activity based management systems; trends in CAD and its impact on Project Management; quality control and Project Management Information Systems.

Class Contact Three hours per week for one semester.

Assessment By assignments and projects and class participation. Assignment 1, 30%; exercises and assignments, 60%; class participation, 10%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.
and management. Computer applications on financial feasibility analysis. Insurance, obsolescence, maintenance and replacement considerations.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester.

**Assessment** Assignments, 15%; group project, 45%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

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**ECP5725 PROJECT CONSTRUCTION MANAGEMENT**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** The subject will develop an understanding of modern building technology with respect to build-ability and user-ability, by examining both construction material interaction and the effect of design criteria on the final quality of the building. The subject content provides an overview of modern technology and the problems that have arisen from it, the lessons to be learned from them and how to try and avoid similar pitfalls in the future. Examine the sources of literature and research material relating to building construction. Examine modern building materials and the problems that are being encountered in their use, including concrete, cement sheet, brickwork, etc. Modern design – current considerations and modern technology including the use of computer based design methods. Building materials and their modern usage, including aluminium, steel and plastics; looking at usage and cost considerations. Low energy buildings, solar energy. Earth covered construction, membrane structures. Modern formwork systems. Fire protection approach to building. On-site considerations. Material handling – crane, hoists, concrete control, concrete pumping and mix design criteria, safety factors and cost implications. Modern construction techniques.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester.

**Assessment** Assignments, 15%; group project, 45%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

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**ECP5735 BUILDING LIFE CYCLE COSTING**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** A description of and the need for consideration of lifecycle costing; maintainability and efficiency. Terotechnology: why we need to use terotechnology in building industry; economic and technical factors – measures of performance; present state of knowledge. An integrated treatment of design, specification, construction use, maintenance and re-use phases for building and the effect on the life-cycle costs of the building. Discounting theory. Time value of money; discounting formulae; inflation; depreciation, taxation; before and after-tax project return; evaluation methods for economy studies. Theory of life-cycle cost optimisation. Basis of theoretical analysis of costs; total life-cost concepts; maintenance costs and capital costs; energy costs and capital costs; taxation and other factors; constraints; technical and others. Practice of life-cycle cost optimisation. Case study; practical issues; introduction; outline of factors to be considered in building obsolescence and refurbishment; market aspects; physical aspects and limitations; authorities and regulatory constraints; economic constraints. Measurement and the assessment of utilisation of resources during each phase of the building process. Design phase (including brief documentation); construction phase; functional (occupational) life; re-evaluation as to refurbish or demolish phase. Asset management using an integrated planning and budgeting approach. Need for an integrated system; provision of funds at regular intervals and/or in emergency situations; fabric of building and other services; total assets management; case studies – Larrobe system, others. Operational control; Control systems; identification of effective, preventive and remedial measures. Establishment of a maintenance policy. Preventive maintenance; corrective maintenance; records and register for maintenance as a control tool; accounting and costs records and audits. Degradation of buildings. Identification of maintenance approaches for building structure, fabric, equipment and plant; nature and causes of degradation. Information and management systems. Building services supervisory system; description Local Monitoring and Control Systems (LMCS); Central Supervisory Systems (CSS). Building engineering services information and management systems; functions; commercially available packages; selection, evaluation of benefits. Case study presentation and review.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester.

**Assessment** Assignment, 20%; group project, 40%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

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**ECP5745 BUILDING REGULATORY MANAGEMENT**

**Campus** Footscray Park

**Prerequisite(s)** Nil.
Content The subject will develop a suitable background and understanding of by-laws and regulations that apply to building activities in Victoria. Subject content includes authorities controlling building activities; role and function of the building surveyors; contents and interpretation of various by-laws and regulations governing building activities such as: Local Government Acts, Building Code of Australia, Water and Sewerage Acts, Health Act, Labour and Industry Act, Lifts and Crane Act, Scaffolding Act, Environmental Protection Act, By-laws governing fire protection, Strata and Cluster Titles Act, Housebuilder’s liability, Land use and development strategy, Guide to administrative procedures, Planning guidelines, Townscape and heritage considerations, Checklist of requirements in a major development. The role of various professional disciplines. General introduction to BC Act. Definitions. Relationship to other Acts, new Acts. Building Approvals process. Introduction to CBA, Part A. Classes of buildings Parts C, D, F and G. Accreditation: Protection of adjoining property. Enforcement. CBA and plan check. Fire as hazard to life and property. Overview of current knowledge in fire start and spread in buildings. Overview of fire safety and regulations in Australia; current practices in regulation and building control; fire safety in new proposed Code. Overview of planning schemes in Victoria. Need for a Uniform Planning Scheme; need for optimisation of planning process. Local Government planning officials’ views on a rational new system; industry perception of the planning system’s current operation; possibility of planning being accomplished by certification. International – scene and practice – what can we learn from it.

Required Reading To be advised by lecturer.


Class Contact Three hours per week for one semester.

Assessment Assignments, 20%; examination, 70%; class participation, 10%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

EEA6312 MODEL BASED PROCESS CONTROL

Campus Footscray Park

Prerequisite(s) Nil.


Class Contact Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.

Assessment Tests, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

EEA6331 CONTROL PRINCIPLES

Campus Footscray Park

Prerequisite(s) Nil

Content This subject is intended to provide a review of classical control system design methods and an introduction to modern methods used in the analysis and design of control systems. The subject covers the following topics: review of continuous linear systems theory and its analytical techniques, e.g. mathematical models, transfer function, root locus, frequency response and state space techniques. Compensation of simple linear systems. Nyquist stability criterion. The design of continuous-time control systems in the s-plane.

Required Reading Ogata, K., Modern Control Engineering, Prentice Hall, Englewood Cliffs, NJ.

Class Contact Four hours per week for one semester comprising lectures, tutorials and laboratories.

Assessment Laboratory exercises, 20%; tests, 30%; final examination, 50%. Students must attain a mark of 50% in each assessable component to pass the subject.

EEA6311 MODELLING AND COMPUTER CONTROL

Campus Footscray Park

Prerequisite(s) EEA5310 or equivalent subjects.

Co-requisite Nil.


Class Contact Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.

Assessment Tests, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.
EA6322 PROCESS INSTRUMENTATION AND CONTROL
Campus: Footscray Park
Prerequisite(s): Nil
Co-requisite: Nil
Required Reading: To be advised by the lecturer.
Recommended Reading: To be advised by the lecturer.
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Assessment: Laboratory exercises, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

EA6331 ROBOTICS AND PROGRAMMED CONTROL
Campus: Footscray Park
Prerequisite(s): Completed an undergraduate degree in Engineering or Science
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Assessment: Assignments and laboratory exercises: 50%; Examination: 50%. A pass in each component of assessment is required for a subject pass.

EA632 ELECTRONIC CONTROL OF MOTORS
Campus: Footscray Park
Prerequisite(s): Nil
Co-requisite: Nil
Required Reading: To be advised by the lecturer.

Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Assessment: Tests/Assignments, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

EA6341 MEASUREMENT TECHNOLOGY
Campus: Footscray Park
Prerequisite(s): Nil
Co-requisite: Nil
Required Reading: To be advised by the lecturer.
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

ECC5010 HIGH LEVEL LANGUAGE PROGRAMMING
Campus: Footscray Park
Prerequisite(s): Prior programming experience in a high level language.
Content: This subject will give students the ability and confidence to apply a computer to the solution of relatively simple problems. Later, students are introduced to data structures and algorithm design techniques. The subject content includes: description of nature and purpose of programming; problems and programs; abstract data types; basic data types; string processing; file design, sequential and random access; sorting and searching; program design; top down, bottom up and other programming styles; algorithm design techniques; algorithms analysis; efficiency of algorithms; analysis of recursive program; efficiency tradeoffs between recursive and iterative programs; good programming practices.
Required Reading: To be advised by lecturer.
Class Contact: Four hours per week for one semester comprising approximately 65% lectures/tutorials and 35% laboratory.
Assessment: Assignments, 30%; examination 70%.

ECC5801 OPERATING SYSTEMS AND MULTIPROCESSING
Campus: Footscray Park
Prerequisite(s): Nil
Required Reading: Halsall, F., 1992, Data Communication, Computer Networks and Open Systems, Addison Wesley.
### EEC6012 APPLIED KNOWLEDGE SYSTEMS

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Co-requisite** Nil  
**Content** The subject provides an introduction to Knowledge Based Systems. It gives an overview of expert systems, neural networks, knowledge programming and natural language systems and examines software associated with these. The subject will familiarise the students with a number of techniques for applying knowledge based systems to real world problems in the control, monitoring and planning domains, including how to select appropriate tools to analyse problems.  
**Required Reading** To be advised by the lecturer.  
**Class Contact** Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.  
**Assessment** Tests/Assignments: 35%; Examination: 65%. A pass in each component of assessment is required for a subject pass.

### EEE5410 ELECTRONIC CIRCUITS

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Content** The subject introduces and studies electronic devices, analog and digital, particularly the commonly used integrated circuit building blocks. Design methods and circuit applications with IC devices are examined. The topics considered are: review of techniques of circuit analysis. Theory and application of an operational amplifier and other analog electronic integrated circuits. Computer simulation. Transducers. Analog-to-digital and digital-to-analog conversion. Techniques to deal with noise and interference. Boolean algebra and logic elements. Overview of logic device families: characteristics, delay, loading, interfacing. Combinational and sequential circuits and applications; MSI devices. Codes, arithmetic circuits. PLD design and applications.  
**Class Contact** Four hours per week for one semester comprising approximately 65% lectures/tutorials and 35% laboratory.  
**Assessment** Examination, 50%; assignments and project work, 50%.

### EEG5011 SOFTWARE ENGINEERING

**Campus** Footscray Park  
**Prerequisite(s)** Approved preliminary course in Software Engineering.  
**Content** The subject will strengthen the student’s knowledge of concepts required to produce high quality software systems within known limitations of resources using sound engineering principles and effective tools. The subject examines principles of software engineering. The topics covered are part of the software life cycle. Requirements elicitation, requirements analysis and specification. The use of formal specification languages such as Z. Analysis and design methods using graphical notations e.g. UML, implementation considerations, testing strategies and construction of test cases, software engineering environments and CASE tools.  
**Class Contact** Three hours per week for one semester comprising approximately 70% lectures/tutorials and 30% laboratory.  
**Assessment** Examination, 65%; laboratory work, tests and assignments, 35%. Students must satisfy examiners in each assessable component to pass the subject.

### EEG5012 MANAGING SOFTWARE PROJECTS

**Campus** Footscray Park  
**Prerequisite(s)** EEG5011 Software Engineering.  
**Content** The subject will develop and improve the skills required to successfully plan and manage software development efforts. The subject content includes: the role of specification in the product life cycle; systems analysis and design; feasibility study and development cycle; the applicability of DP techniques to technical program management; defining software requirements, documentation; preparation of good project plans, size and function point metrics and their use in estimation of time and costs; implementing management controls for design and integration; the use of standard project management techniques and software packages; team working, codes of practice, whole life costing, system support plans; hardware/software integration and testing, product support and maintenance, controlling changes to software and documentation; control of the programming support environment. The assignment and laboratory work consists of design, analysis and management of a large scale software project.  
**Required Reading** To be advised by lecturer.  
**Class Contact** Three hours per week for one semester comprising approximately 65% lectures/tutorials and 35% laboratory.  
**Assessment** Examination, 50%; assignments and project work, 50%.

### EEG5013 DATA BASE AND QUERY SYSTEMS

**Campus** Footscray Park  
**Prerequisite(s)** EEL5010 High Level Language Programming.  
**Content** The subject will further the understanding of the design, implementation and applications of database systems. The subject examines: introduction to database systems; different database models; examples of current systems; overviews and use of DBMS, physical data organisation, database architecture, SQL, query by example; query optimisation; design theory for relational databases, database integrity and security; implementation issues, distributed systems.  
**Required Reading** To be advised by lecturer.  
**Class Contact** Three hours per week for one semester comprising approximately 70% lectures/tutorials and 30% laboratory.
EEG5015 APPLIED KNOWLEDGE SYSTEMS

Campus Footscray Park
Prerequisite(s) EEL5010 High Level Language Programming (or equivalent).

Content The subject will provide familiarity with a number of techniques for applying knowledge based systems to real world problems in the control, monitoring and planning domains, and how to select and analyse appropriate problems and tools. The subject provides an introduction to Knowledge Based Systems. It gives an overview of expert systems, neural networks, knowledge programming and natural language systems and examines software associated with these.


Recommended Reading Patterson, Dan W. 1990, Introduction to Artificial Intelligence and Expert Systems, Prentice-Hall.

Class Contact Three hours per week for one semester, comprising lectures/tutorials and laboratory.

Assessment Final examination, 65%; assignments, 20%; laboratory work, 15%.

EEG5016 COMPUTER NETWORKING

Campus Footscray Park
Prerequisite(s) EEL5010 High Level Language Programming (or equivalent). Students need to be proficient in C programming.

Content The subject provides students with an overview of computer networks including the topics of network topologies: star mesh and ring networks; access methods: CSMA, ring bus; network facilities (using Unix), electronic mail, file transfer, resource sharing, network software standards: IEEE802 family and Open Systems (OSI) Network implementations and security. It also examines wide area networks (WAN); inter-networking; application support protocols and TCP/IP application protocols.


Class Contact Three hours per week for one semester, comprising lectures/tutorials and laboratory.

Assessment Assignments, 35%; examination, 65%.

EEG5024 OBJECT ORIENTED SOFTWARE

Campus Footscray Park
Prerequisite(s) EEL5010 High Level Language Programming (or equivalent).

Content This subject will study the object oriented approach to software development through the analysis, design and implementation phases of the software life cycle. Its content includes the object oriented (OO) concepts of classes, inheritance, polymorphism, encapsulation; and the use of Object Oriented languages and environments. It applies the techniques to engineering applications.

Required Reading To be advised by the lecturer.

Class Contact Three hours per week for one semester comprising two hours lectures/tutorials and one one-hour laboratory.

EEG5112 MICROELECTRONIC DESIGN

Campus Footscray Park
Prerequisite(s) Nil.

Content The subject will expose students to alternative approaches to designing systems in silicon and develop concepts of semi-custom and full-custom implementation. In addition, the subject will examine the total design process from initial conception to chip implementation, manufacture, testing and commercial aspects. The subject includes review of MOS technologies; MOS circuit topology and CAD tools; analog and digital CMOS circuit design; ISD VLSI design suite; circuit protection and scaling; ASC and GaAs design technique and technology.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester based on one hour lecture and two hours of laboratory.

Assessment Examination, 30%; laboratory/project, 70%. A satisfactory level of assessment for each component is required for a subject pass.

EEG5113 ADVANCED MICROPROCESSORS

Campus Footscray Park
Prerequisite(s) EEG5111 Computer Technology.

Content The subject investigates 32-bit microprocessors, with emphasis on embedded system development using a high level language. Sophisticated support peripherals are also examined, along with an introduction to RISC processors. The following topics are examined: 68020 programming model, data organisation, addressing modes and instruction set. Exception processing, stack frames, parameter passing and procedure calls. Software development for embedded systems using the C language. External bus behaviour and design of decoders, STACK and BERR circuitry using PLDs. Interfacing memory and peripheral devices. Embedded microcontroller devices based on the 68xxx family – architecture, features, peripherals and programming via C Coprocessor interface and memory management.

Required Reading Antonakos, J.L., The 68000 Microprocessor, Prentice Hall.

Recommended Reading Williams 1989, 68030 Assembly Language Reference, Addison Wesley. MC68020 32-bit Microprocessor
**EEG5114 OPERATING SYSTEMS AND MULTIPROCESSING**

**Campus** Footscray Park  
**Prerequisite(s)** EEG5111 Computer Technology  

**Content** The subject examines the following topics. Operating systems' functions, including implementation, and real-time operation, and will examine the use of concurrent languages. The subject examines the following topics.


**Required Reading** To be advised by the lecturer.

**Assessment**  
- Assignment, 20%; laboratory, 15%; examination, 65%; Supplementary assessment will not be available.

**EEG5223 DIGITAL SIMULATION OF PROTECTION SYSTEMS**

**Campus** Footscray Park  
**Prerequisite(s)** Nil.

**Content** A review of different techniques available for digital protection via time domain and frequency domain methods. Advantages of computer simulation techniques. Modal analysis to simulate faults of the transposed and untransposed multi-conductor 3-phase system including the transducers, shunt reactors and series capacitors. Mathematical model of the fault circuit using the principles of superstition. Use of electromagnetic transient program. Use of powerline carrier, pilot wire and radio links. Transient performance and its evaluation.

**Required Reading** To be advised by the lecturer.

**Assessment**  
- Assignment, 50%; project, 50%.

**EEG5311 DIGITAL CONTROL**

**Campus** Footscray Park  
**Prerequisite(s)** EEA5310 Control Principles.

**Content** This subject provides the background material for subsequent subjects in the automation system engineering sequence. Z-domain and state space methods of analysis of control systems will be presented and the relative merits of each method investigated. In particular the subject will provide the background to enable the student to keep abreast of the rapid advancement in this field. The subject covers the following topics. Review of Z domain analysis; impulse sampling; pulse transfer function; mapping between S and Z-plane; stability analysis; transfer function concept as applied to discrete time systems. State space analysis; concept of space; linear differential equations; state transmission matrix for linear time varying and time invariant systems; controllability; observability; canonical forms; input/output models; state feedback and modal control; state observers; multivariable control; stochastic processes; overview of distributed control systems. Computer aided analysis and design of control systems—an introduction to MatLab.

**Required Reading** Ogata, *Discrete Time Control Systems*, Prentice-Hall.

**Recommended Reading** Franklin, Powell and Workman, *Digital Control of Dynamic Systems*, Addison-Wesley.

**Class Contact** Three hours per week for one semester comprising approximately 70% lectures/tutorials and 30% laboratory.

**Assessment**  
- Laboratory, 15%; assignment, 15%; examination, 70%.
EEG5312 CONTROL SYSTEMS DESIGN
Campus Footscray Park
Prerequisite(s) EEG5311 Digital Control.
Content This subject presents design methods for control systems. Students will be exposed to the use of computer design packages for control system design. The subject content comprises frequency response design; robustness, sensitivity to modelling errors and other practical aspects.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester comprising lectures, tutorials and laboratories.
Assessment Laboratory and assignment, 50%; minor project, 50%.

EEG5333 OPTIMAL CONTROL
Campus Footscray Park
Prerequisite(s) EEG5311 Digital Control.
Content The subject presents advanced methods of analysis and design of optimal systems which are finding increasing use in the industrial automation area. The subject content comprises introduction to optimal analysis and design; linear quadratic control; prediction and filtering theory; linear quadratic Gaussian control; Kalman filtering. Problem formulation; optimal prediction; LQG control.
Required Reading To be advised by the lecturer.
Class Contact Three hours per week for one semester comprising lectures, tutorials and laboratories.
Assessment Laboratory exercises, 20%; assignments, 20%; final examination, 60%. Students must attain a mark of 50% in each assessable component to pass the subject.

EEG5334 ADAPTIVE CONTROL SYSTEMS
Campus Footscray Park
Prerequisite(s) EEG5311 Digital Control.
Content Adaptive control is the most advanced form of discrete time control system and is still in the development stage. This subject provides the background, and the opportunity, for the student to design and build an on-line real time adaptive control system. The subject consists of: types of adaptive control; system identification by the recursive least squares method and maximum likelihood methods; prediction error identification; order determination and model validation; the minimum variance method; the maximum likelihood method; prediction error identification; recursive least squares; least squares; adaptive control; uses and abuses of adaptive control; case studies of various adaptive systems.
Required Reading To be advised by the lecturer.
Class Contact Three hours per week for one semester, comprising lectures, tutorials and laboratory.
Assessment Minor project, 50%; examination, 50%. Students must attain a mark of 50% in each assessable component to pass the subject.

EEG5321 ROBOTICS
Campus Footscray Park
Prerequisite(s) Completion of an undergraduate degree in Engineering or Science.
Class Contact Three hours per week for one semester based on two hours of lecture/tutorial and one one-hour laboratory.
Assessment Approximately: final examination, 50%; laboratory and assignments, 50%. A satisfactory level of assessment for both components is required for a subject pass.

EEG5421 MICROWAVE ELECTRONIC CIRCUIT DESIGN
Campus Footscray Park
Prerequisite(s) Nil.
Content This subject will provide an introduction to microwave electronic design based around the 'Microstrip' transmission line structure. Students will be given small design projects to complete operating at the frequencies relevant to mobile communications (i.e. 0.9 to 2.3 GHz). Extensive use will be made of Hewlett Packard's simulation and design package MDS and other software packages in this course. The subject consists of: A review of basic transmission line theory. A review of microwave transmission line structures. A discussion of corrections for microstrip discontinuities. A review of the Smith Chart. Consideration of matching requirements for small signal amplifiers. A review of several matching techniques. Consideration of bias circuit design, power amplifier design, microstrip couplers and microstrip filters.
Class Content Three hours per week for one semester comprising lectures, tutorials and laboratory.
Assessment Project, laboratory work, 50%; examination 50%. Students must attain a satisfactory assessment in both sections of the subject to obtain a pass in the subject.
POSTGRADUATE SUBJECT DETAILS

EEG5601 PROJECT WORK

Campus Footscray Park
Prerequisite(s) Students must have completed at least two coursework units of the major sequence.
Content This is systematic experimental developmental work, using existing knowledge gained from research and/or practical experience, for the purpose of creating new or improved materials, products, devices, processes or services.
Required Reading To be advised by lecturer.
Class Contact Six hours per week per semester.
Assessment Project work and report, 100%.

EEG5602 PROJECT WORK

Campus Footscray Park
Prerequisite(s) Students must have completed at least two coursework units of the major sequence.
Content This is systematic experimental developmental work, using existing knowledge gained from research and/or practical experience, for the purpose of creating new or improved materials, products, devices, processes or services.
Required Reading To be advised by lecturer.
Class Contact Six hours per week per semester.
Assessment Project work and report, 100%.

EEG5611 MINOR THESIS

Campus Footscray Park
Prerequisite(s) Students must have completed at least two coursework units of the major sequence.
Content A minor thesis is based on applied research carried out by the candidate. Applied research is original work undertaken to acquire new knowledge, with a specific, practical application in view. Applied research is undertaken to determine possible uses for the findings of basic research or to determine new methods or ways of achieving some specific and predetermined objectives.
Required Reading To be advised by lecturer.
Class Contact Four hours per week per semester comprising lectures and laboratories.
Assessment Assignment, 25%; laboratories exercise, 25%; final examination, 50%. Students must obtain a satisfactory mark in each assessable component to pass the subject. Supplementary assessment will not normally be available.

EEG5612 MINOR THESIS

Campus Footscray Park
Prerequisite(s) Students must have completed at least two coursework units of the major sequence.
Content A minor thesis is based on applied research carried out by the candidate. Applied research is original work undertaken to acquire new knowledge, with a specific, practical application in view. Applied research is undertaken to determine possible uses for the findings of basic research or to determine new methods or ways of achieving some specific and predetermined objectives.
Required Reading To be advised by lecturer.
Class Contact Six hours per week per semester for two semesters or equivalent.
Assessment Thesis supported by experimental work, 100%.

EEG5614 MINOR THESIS

Campus Footscray Park
Prerequisite(s) Students must have completed at least two coursework units of the major sequence.

Content A minor thesis is based on applied research carried out by the candidate. Applied research is original work undertaken to acquire new knowledge, with a specific, practical application in view. Applied research is undertaken to determine possible uses for the findings of basic research or to determine new methods or ways of achieving some specific and predetermined objectives.

Required Reading To be advised by lecturer.
Class Contact Twelve hours per week for one semester or equivalent.
Assessment Thesis supported by experimental work, 100%.

EEH5110 MICROPROCESSOR SYSTEMS

Campus Footscray Park
Prerequisite(s) Nil.
Content Development in microprocessor technology. Increasing function density. Development of application program using software tools and high level languages (Pascal or C). Digital circuit design. Top-down design for hardware systems and Algorithmic State Machine (ASM) method. Programmable logic devices (PLDs). Single chip microprocessor systems, instruction set, addressing modes, peripheral ports, interrupt and input/output handling. 68HC11 assembly language programming.
Class Contact Four hours per week for one semester comprising lectures and laboratories.
Assessment Assignment, 25%; laboratories exercise, 25%; final examination, 50%. Students must obtain a satisfactory mark in each assessable component to pass the subject. Supplementary assessment will not normally be available.

EEH6001 HDL AND HIGH LEVEL SYNTHESIS

Campus Australian Microelectronics Institute Partner Universities
Prerequisite(s) Completed Digital Systems at undergraduate level or equivalent.
Content Hardware modelling and design flow, Features requirements of Hardware Languages (structural and behavioural), Abstract Models, Compilation and Optimisation Techniques. Hardware Description Language VHDL and/or Verilog Architectural – Level Synthesis and Optimisation Modelling, the Fundamental architectural synthesis problems, Area and performance estimation, Data path and Control Unit Synthesis, Synthesis of Pipelined Circuits. Synthesis Techniques, Logic synthesis and optimisation, FPGAs synthesis, folding and partitioning, Multi-level logic synthesis techniques; Structured layout styles, Local and global transformations. State machine synthesis techniques; High level synthesis techniques: Strategies for high level synthesis, Scheduling and allocation operations, High-level optimisations. Realisation using FPGAs and CPLDs. Coding standards. Industry Standard EDA Tools.
**EEH6002 INTEGRATED CIRCUIT DESIGN**

**Campus** Australian Microelectronics Institute Partner Universities

**Prerequisite(s)** Completed Digital Systems at undergraduate level or equivalent.

**Content** Overview of MOS and sub-micron technology, scaling and signal integrity, IC design techniques. CMOS cell design: device-level design constraints, gate design, parasitic circuit, sequential circuits, mask level design. Layout considerations, design rules and mask level design. Circuit optimisation techniques. ASIC and custom design, synchronous system design. Timing issues in VLSI circuit design. Design of VLSI system sub-systems: Arithmetic and logic processing elements, adders, counters, I/Os, buffers, data path design and layout, etc. Chip floor planning. Basic analog building blocks. Design tradeoffs—cost, power and performance. Testability and yield.


**Class Contact** Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.

**Assessment** Assignment and laboratory exercises, 20%; project, 30%; and final examination, 50%.

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**EEH6003 TOOLS AND DESIGN METHODOLOGY**

**Campus** Australian Microelectronics Institute Partner Universities

**Prerequisite(s)** Completed Digital Systems at undergraduate level or equivalent.


**Required Reading** Current available text book—students to be advised.


**Class Contact** Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory/workshop and project.

**Assessment** Assignment and laboratory exercises, 20%; project, 30%; and final examination, 50%.

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**EEH6004 DIGITAL SYSTEM DESIGN**

**Campus** Australian Microelectronics Institute Partner Universities

**Prerequisite(s)** Completed Digital Systems at undergraduate level or equivalent.


**Required Reading** Current available text book—Student to be advised.


**Class Contact** Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises.

**Assessment** Assignment, 20%; laboratory exercises, 30%; and final examination, 50%.

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**EEH6005 EMBEDDED SYSTEM DESIGN**

**Campus** Australian Microelectronics Institute Partner Universities

**Prerequisite(s)** Completed Microprocessor Systems at undergraduate level or equivalent.

**Content** Overview of embedded systems. Embedded system design cycle and system modeling. Embedded system hardware and software. Real-time embedded system. Embedded system specification and verification. Hardware/software co-design, partitioning and tradeoffs. Embedded development tools. Analysis and design methods using graphical notations eg. UML, implementation considerations, testing strategies and construction of test cases, software engineering environments and CASE tools. Embedded system design and verification.


**Class Contact** Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.

**Assessment** Assignment and laboratory exercises, 20%; project, 30%; and final examination, 50%.

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**EEH6006 EMERGING TOPICS IN IC DESIGN**

**Campus** Australian Microelectronics Institute Partner Universities

**Prerequisite(s)** Nil.

**Content** New technologies such as: Silicon carbide high-power devices, Quantum based devices, quantum wells and quantum dots Nanometer MOSFETs, Wide bandgap materials and devices, Plasma-wave electronics, Ferroelectrics devices. Overview of new process technologies. Deep sub-micron technology and noise. Ultra-high-speed devices, including microwave and optical devices. New Systems-Level Architectures, such as: Nanowire arrays, Neuromorphic architectures, Reconfigurable architectures, Wafer-scale systems, Memory systems. New EDA tools and future technology projections. EMC regulations, measurement and testing. Design issues related to EMC.


Class Contact  Four hours per week for one semester comprising two hours per week lectures and two hours per week of workshops and seminars.

Assessment  Assignments, 30%; seminars, 20%; and final examination, 50%.

EEH6007 ADVANCED VLSI DESIGN

Campus  Australian Microelectronics Institute Partner Universities

Prerequisite(s)  EEH6002 or equivalent.


Class Contact  Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.

Assessment  Assignment and laboratory exercises, 20%; project, 30%; and final examination, 50%.

EEH6008 VLSI DIGITAL SIGNAL PROCESSING SYSTEMS

Campus  Australian Microelectronics Institute Partner Universities

Prerequisite(s)  Completed DSP course at undergraduate level. 


Recommended Reading  Bayoumi, M.A., 1994, VLSI Design Methodology for DSP Architectures, Kluwer.

Class Contact  Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.

Assessment  Assignment and laboratory exercises, 20%; project, 30%; and final examination, 50%.

EEH6009 RELIABILITY AND TESTABILITY IN IC DESIGN

Campus  Australian Microelectronics Institute Partner Universities

Prerequisite(s)  EEH6001, EEH6002 and EEH6003 or equivalents.

Content  Reliability: parallel and serial reliability, failure rates. Reliability as affected by smaller dimensions and faster devices, thermal considerations. Redundancy and fault tolerance. Design for device reliability. Functional and formal verification and fault modelling. Hardware/software co-design, co-verification and co-simulation. Timing and power analysis. Design for testability and ATPG and fault coverage tools. Layout issues for testability. Testing methodologies (In-circuit, Built in self test), Boundary Scan Testing. Memory testing, BIST of RAMs, RAM interconnection testing, Scan based testing of multimegabit memories, external and internal testing of megabit DRAMs. Comprehensive testing of multistage interconnection networks. Embedded system testing. Board-level interconnect testing. Test bench design.


Class Contact  Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises.

Assessment  Assignment, 20%; laboratory exercises, 30%; and final examination, 50%.

EEH6010 INTRODUCTION TO MICROSYSTEM TECHNOLOGY

Campus  Australian Microelectronics Institute Partner Universities

Prerequisite(s)  Nil.


Class Contact Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises.
Assessment Assignments, 20%; laboratory exercises, 30%; and final examination, 50%.

EEH6011 INTRODUCTION TO SEMICONDUCTOR DEVICE FABRICATION
Campus Australian Microelectronics Institute Partner Universities
Prerequisite(s) Nil
Content Fundamental principles of fabrication processes, physical and chemical models for crystal growth, oxidation, ion implantation, etching, deposition, lithography and metallisation. Emphasis is on practical aspects of silicon device fabrication, including wafer cleaning, photolithography, etching, oxidation, diffusion, ion implantation, chemical vapour deposition, physical sputtering and wafer testing. Imperfections in semiconductors, crystal growth, solid solubility, alloying and diffusion, ion implantation, oxide masking, and epitaxy. Practical and fundamental limits to the evolution of the technology of MOS and bipolar devices. How are integrated circuits fabricated and what future changes are likely? The implications for device performance caused by material properties and fabrication techniques. Fabrication techniques for bipolar and MOS-devices, and the electrical performance of devices based on these techniques. Comparison of fabrication technologies for silicon and gallium arsenide devices. Processes and fabrication equipment to be studied will include oxidation/diffusion, CVD reactors, photolithography, plasma etching, vacuum evaporator, ion implantation, etc. Introduction to computer modelling of processing steps such as etching, lithography, diffusion, implantation (eg SUPREM III).
Class Contact Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises.
Assessment Assignments, 20%; laboratory exercises, 30%; and final examination, 50%.

EEH6013 PROJECT MANAGEMENT AND ENTREPRENEURSHIP
Campus Australian Microelectronics Institute Partner Universities
Prerequisite(s) Nil
Required Reading Current available text book – students to be advised. Appropriate journal papers.
Class Contact Four hours per week for one semester.
Assessment Assignments, 20%; seminar presentations, 10%; project, 30%; and final examination, 40%.

EEH6014 RF AND MIXED SIGNAL DESIGN
Campus Australian Microelectronics Institute Partner Universities
Prerequisite(s) Completed Analog Electronics at undergraduate level.
Content Basic concepts of wireless communication systems design. Transceiver architectures. VLSI design issues and layout techniques in wireless transceiver design. Radio circuits, LNAs, oscillators, mixers, limiters, phase detectors, frequency synthesizers, PLLs and power amplifiers. Low voltage low power design techniques and design flow for analog and mixed signal circuits and systems. OpAmps, comparators, A-to-D and D-to-A conversion circuits. Noise analysis and design tradeoffs – cost, power and performance. Students will develop hands-on experience in design, simulation, verification and implementation using industry standard EDA tools.
Class Contact Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.
Assessment Assignment and laboratory exercises, 20%; project, 30%; and final examination, 50%.
**EEH6020 MINOR PROJECT**

**Campus** Australian Microelectronics Institute Partner Universities  
**Prerequisite(s)** Completed EEH6001, EEH6002, EEH6003 or equivalents.  
**Content** It is expected that the majority of industry-based students will undertake projects as part of their normal employment, where relevant opportunities exist and suitable resources and supervision can be guaranteed. A project can be structured to be the equivalent of 2 units of study. Projects would be expected to demonstrate a good working knowledge in chip design and implementation. Students must demonstrate their ability to integrate and draw upon their coursework studies relevant to the project. A dissertation of less than 10,000 words must be submitted and will be examined by one examiner selected by the examining panel for this module. Commercial in-confidence programs can be undertaken, with appropriate rights, restrictions on publication and choice of examiners. Intellectual property of projects initiated by a company and undertaken in that company will remain with the company. All other projects will be subject to the Intellectual Property policy of the relevant university partner.  
**Required Reading** Current available text – students to be advised. Appropriate IEEE/IEE Journal materials.  
**Class Contact** Eight hours per week for one semester.  
**Assessment** Assessment will be based on project proposal, 10%; progress report and seminars, 10%; project, 40%; and final report, 40%.

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**EEH6030 MAJOR PROJECT**

**Campus** Australian Microelectronics Institute Partner Universities  
**Prerequisite(s)** Completed EEH6001, EEH6002 and EEH6003 or equivalents.  
**Content** It is expected that the majority of industry-based students will undertake projects as part of their normal employment, where relevant opportunities exist and suitable resources and supervision can be guaranteed. Collaboration with international partners will also be encouraged. A project can be structured to be the equivalent of 4 units of study. Projects would be expected to demonstrate mastery in chip design and implementation at a level considered no less than that of an experienced practitioner in the field. Students must demonstrate their ability to integrate and draw upon their coursework studies relevant to the project. A dissertation of less than 15,000 words must be submitted and will be examined by two examiners selected by the examining panel for this module. Commercial in-confidence programs can be undertaken, with appropriate restrictions on publication and choice of examiners. Intellectual property of projects initiated by a company and undertaken in that company will remain with the company. All other projects will be subject to the Intellectual Property policy of the relevant university partner.  
**Required Reading** Current available text – students to be advised. Appropriate IEEE/IEE Journal materials.  
**Class Contact** Sixteen hours per week for one semester.  
**Assessment** Assessment will be based on project proposal, 10%; progress report and seminars, 10%; project, 40%; and final report, 40%.
associated memories. Systolic and wavefront arrays. Application driven architecture.


**Class Contact** Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.

**Assessment** Test, assignments and laboratory exercises 40%, final examination 60%.

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**EEH6112 DEDICATED INTEGRATED CIRCUIT DESIGN**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil

**Content** The subject will expose students to alternative approaches to designing systems in silicon and develop concepts of semi-custom and full-custom implementation. In addition, the subject will examine the total design process from initial conception to chip implementation, manufacture, testing and commercial aspects. The subject includes review of MOS technologies; MOS circuit topology and CAD tools; analog and digital CMOS circuit design using ISD VLSI design suite; circuit protection and scaling; ASIC and GaAs design technique and technology.

**Required Reading** To be advised by the lecturer.

**Recommended Reading** To be advised by the lecturer.

**Class Contact** Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.

**Assessment** Laboratory exercises/project: 70%; Examination: 30%. A pass in each component of assessment is required for a subject pass.

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**EEH6121 BASIC IC DESIGN/ DEVICES**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** Bipolar and CMOS structures. Logic design: Introduction to CMOS circuit design: Switch level analysis of NMOS and CMOS structures, CMOS logic gates using static and dynamic logic, Precharging techniques, latch up, pass transistor/transmission gate logic. PLA logic: static and dynamic design. Memory. Design of subsystems using sequential logic.


**Class Contact** Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.

**Assessment** Test, assignments and laboratory exercises 40%, final examination 60%.

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**EEH6122 CUSTOM IC DESIGN A**

**Campus** Footscray Park

**Prerequisite(s)** EEH6121 Basic IC Design/Devices or equivalent

**Content** CMOS cell design: device-level design constraints, Circuit optimisation techniques, gate matrix method. Review of tools for low-level cell design: Mentor Graphics circuit design and verification tools, HSPICE and PSPICE simulation tools. Basic analog building blocks. Timing issues in VLSI circuit design. Design of VLSI system sub-systems: Arithmetic and logic processing elements, adders, counters, etc, data path design and layout. Chip floorplanning.

**Required Reading** Gopalan, K., 1996, Introduction to Digital Microelectronic Circuits, IRWIN.


**Class Contact** Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.

**Assessment** Test, assignments and laboratory exercises 40%, final examination 60%.

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**EEH6131 HARDWARE DESCRIPTION BASED DESIGN**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil

**Content** Introduction to VHDL: traditional design methods, hardware, abstraction. Language elements: basic terminology, entity, modelling of architecture (structural, data flow and mixed) identifiers, data objects and types, operators. Subprograms and overloading. Packages and libraries. Synthesis constraints, attributes, technology libraries, realisation with CPLDs and FPGAS-EDA design and development tools.


**Class Contact** Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.

**Assessment** Assignments and laboratory exercises: 35%; Examination: 65%. A pass in each component of assessment is required for a subject pass.

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**EEH6132 INTEGRATED CIRCUIT TESTABILITY**

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Content** System partitioning, Layout and testability, Design for testability. Defects and fault models. Functional and structural testing. Test access. DFT techniques. Fault simulation and automatic test pattern generation. Ad-hoc DFT. Scan-path DFT. Built-in self test (BIST). Boundary scan DFT.


**Recommended Reading** Pucknell, D.A. and Eshraghian, K., 1994, Basic VLSI Design System and Circuits, Prentice Hall.
Class Contact Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.
Assessment Test, assignments and laboratory exercises 40%, final examination 60%.

EEH6141 REAL TIME EMBEDDED SYSTEMS
Campus Footscray Park
Prerequisite(s) Nil
Co-requisite Nil
Content Real-time computer systems, an ASM description and the components of a real-time system. Using C as a real-time programming language; software development for embedded systems. 68020 programming model, data organisation, addressing modes and instruction set. Exception processing, stack frames, parameter passing and procedure calls. Linking high and low-level programs. Startup routines, interrupt systems and service routines. Interface to external signals and devices, real-time clock interfaces. Task scheduling and synchronisation, data transfer between tasks. Examples of monitors and real-time executors. Factors in selecting a real-time operating system.
Required Reading Antonakos, J.L., The 68000 Microprocessor, Prentice Hall.
Class Contact Three hours per week for one semester. This includes one hour of lecture per week, one hour of tutorial and one hour of laboratory.
Assessment Examination 100%.

EEH6142 EMERGING TECHNOLOGIES
Campus Footscray Park
Prerequisite(s) Nil
Required Reading Selected papers from IEEE/IEE Journals. To be advised by the lecturer.
Class Contact Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.
Assessment Test, assignments and laboratory exercises 40%, final examination 60%.

EEH6151 VHDL AND HIGH LEVEL SYNTHESIS
Campus Footscray Park
Prerequisite(s) Nil
Class Contact Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.
Assessment Test, assignments and laboratory exercises 40%, final examination 60%.

EEH6152 ADVANCED MICROPROCESSORS
Campus Footscray Park
Prerequisite(s) EEH6111 Digital Circuit Design
Content 68020 programming model, data organisation, addressing modes and instructions sets. Exception processing, stack frames, parameter passing and procedure calls. Software development for embedded systems. External bus behaviour and design of decoders, Stack and BERR circuitry using PLDs. Interfacing memory and peripheral devices. Embedded microcontroller devices – architecture, features, peripherals and programming, Coprocessor interface and memory management.
Required Reading Selected papers from IEEE/IEE Journals. To be advised by the lecturer.
Class Contact Three hours per week for one semester comprising two hours per week of lecture and one hour per week of tutorial/laboratory.
Assessment Test, assignments and laboratory exercises 40%, final examination 60%.

EEP6212 DISTRIBUTION SYSTEMS
Campus Footscray Park
Prerequisite(s) Nil
Co-requisite Nil
Required Reading To be advised by the lecturer.
EET5500 COMMUNICATION SYSTEMS CASE STUDY

**Campus** Footscray Park

**Prerequisite(s)** EET5510 Communication Theory.

**Content** This subject provides the students with the opportunity to carry out in-depth study of specific communication systems and networks. A typical study would involve a detailed literature search at the beginning and a full report on completion. In addition, students will be required to present their design or finding in two seminars, one mid-semester and the other at the end of the semester.

**Required Reading** Technical journal articles and other references as determined.

**Class Contact** Three hours per week for one semester.

**Assessment** Final report, 70%; technical presentation, 30%.

EET6500 RESEARCH PROJECT

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil

**Content** Semester One: Introduction to research methodology: System modeling, and simulation procedures. MATLAB and its application in the design and simulation of communication subsystems. Semester Two: OPNET and other industry standard simulation tools and their application in telecommunication systems modeling and simulation.

**Required Reading** To be advised by lecturer.

**Recommended Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester.

**Assessment** Preliminary assignments, 40%; final assignment, 60%.

EET6511 DATA NETWORK ANALYSIS AND DESIGN

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

EET6512 INTELLIGENT NETWORKS AND NETWORK MANAGEMENT

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil


**Class Contact** Three hours per week for one semester comprising 2 hour lecture and 1 hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

EET6521 DIGITAL SWITCHING AND SIGNALLING SYSTEMS

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil

**Content** Historical development of telecommunication switching systems. Switching system limitations. Single and multistage switches. Limited availability switches. Digital switching principles. Time and space switching matrices. Modern

**Required Reading** To be advised by the lecturer.

**Recommended Reading** To be advised by the lecturer.

**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

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### EET6522 TELECOMMUNICATION TARIFF STRUCTURES AND TELETRAFFIC ENGINEERING

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil


**Required Reading** To be advised by the lecturer.


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

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### EET6531 WIRELESS COMMUNICATION SUBSYSTEMS

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil

**Content** This subject will provide a theoretical and practical understanding of wireless communication systems and the subsistems involved in them. It provides an overview of existing wireless systems with special reference to its hardware implementation. Subject content will include the following: Propagation modelling at UHF. Path loss, slow fading and fast fading. Okumura's model. Delay spread, coherence bandwidth, and level crossing rate. Multipath propagation. Interference cancellation. Antennas. Antenna gain, radiation resistance, and phased array antennas. Base station antennas for cellular mobile systems. Low profile portable antennas. Modulation and coding for the mobile channel. FM, CPM, GMSK, and QPSK. Bit error rate and error flow. Channel equalisation. The effect of space, time and frequency diversity. Spread spectrum. CDMA, TDMA and FDMA.

**Required Reading** To be advised by the lecturer.

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### EET6532 MICROWAVE AND SATELLITE COMMUNICATION SYSTEMS

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

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### EET6541 MULTIMEDIA AND INTERNET TECHNOLOGY

**Campus** Footscray Park

**Prerequisite(s)** Nil

**Co-requisite** Nil

workstations and servers. Information super highways. Internet. HTML, Java and object oriented programming.


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

### EET6542 MOBILE AND PERSONAL COMMUNICATION SYSTEMS

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Co-requisite** Nil  


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

### EET6551 MICROWAVE ELECTRONIC CIRCUIT DESIGN

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Co-requisite** Nil  
**Content** This subject will provide an introduction to microwave electronic circuit design based around the ‘Microstrip’ transmission line structure. Students will be given small design projects to complete operating at the frequencies relevant to mobile communications (ic. 0.9 to 2.3 Ghz). Extensive use will be made of Hewlett Packard’s simulation and design package, MDS and other software packages in this course. The subject content consists of the following: A review of basic transmission line theory. A review of microwave transmission structures. A discussion of corrections for microstrip discontinuities. A review of the Smith Chart. Consideration of matching requirements for small signal amplifiers. A review of matching techniques. Bias circuit design and power amplifier design.


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

### EET6532 COMPUTER NETWORKS AND NETWORKING SOFTWARE

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Co-requisite** Nil  


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

### EET6561 LOCAL AREA AND BROADBAND NETWORKS

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Co-requisite** Nil  

**Required Reading** To be advised by the lecturer.


**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.
### POSTGRADUATE SUBJECT DETAILS

#### EET6562 DIGITAL SIGNAL PROCESSING

**Campus** Footscray Park  
**Prerequisite(s)** Nil  
**Co-requisite** Nil  
**Content** The subject will provide a theoretical and practical understanding of digital signal processing techniques. Particular emphasis is placed on its applications to telecommunication circuit design and implementation. The subject examines the following topics: Aliasing, Quantisation. Signal reconstruction distortion. Dynamic ranges. Round-off errors. IIR digital filter design. Bilinear transformation and impulse invarient methods. FIR digital filter design. Windowing, Frequency sampling. Minimum phase and linear phase filter design. Effect of sampling rate variation. Decimation and interpolation. Adaptive filtering. LMS algorithm and its application. SO implementations of modulators, oscillators, limiters, phase shifters and other circuits. Design of modems, voice coders, image processors, and antenna beam formers.  
**Required Reading** To be advised by lecturer.  
**Recommended Reading** To be advised by lecturer.  
**Class Contact** Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.  
**Assessment** Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

#### EPM5001 INTEGRATING INTERMODAL FREIGHT SYSTEMS

**Campus** Werribee  
**Prerequisite(s)** EPM5000 Intermodal Freight Markets – Dynamics and Structure.  
**Content** This subject focuses on the need to create seamlessness in transport services and operations that span complex networks involving different modes and many interface points – depots, terminals, warehouses, ports, for example. It recognises that intermodal efficiency may not be easily achieved; and that action may be required on many fronts – including operational capacity matching, alliance formation, information and e-Business streamlining, rationalising chain structures, eliminating market structure inefficiency and harmonising policies and policy frameworks. Particular attention is paid to capacity measurement, provision and adjustment in freight networks; to efficiency costs and pricing frameworks; to ways and means of achieving efficient chain and supply chain structures; and to overcoming policy and regulatory constraints. This subject draws heavily not only on the Australian freight industry but also on international experience.  
**Required Reading** Course Handbook provided to each student.  
**Class Contact** Forty five hours of block mode teaching.  
**Assessment** Case study and seminar presentation, 10%; Syndicate group project, 40%; Research report, 50%.

#### EPM5002 DEFINING STRATEGIES FOR INTERMODAL FREIGHT SYSTEMS

**Campus** Werribee  
**Prerequisite(s)** Nil  
**Content** This subject builds on the concepts, skills and techniques developed in EPM5000 and EPM5001. In those subjects students examined the nature of the intermodal freight market and the role of the intermodal service provider in it; and the ways and means of managing to achieve seamless and efficient operations. In this subject the guiding questions are strategic ones and focus on positioning the firm for the future. More particularly, the subject develops a strong understanding of the notion of strategy and of an adequate conceptual framework within which to define strategies. It also outlines some quite specific attributes of strategy for intermodal firms and for the

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<tr>
<th>Postgraduate Subject Details</th>
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<tr>
<td><strong>Assessment</strong></td>
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<tr>
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<td>Case study and seminar presentation, 10%; Syndicate group project, 40%; Research report, 50%.</td>
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Effective achievement of integrated freight networks. This subject draws heavily not only on the Australian freight industry but also on international experience.

**Required Reading**

**Recommended Reading**

**Class Contact**
Fifty five hours of block mode teaching.

**Assessment**
Case study and seminar presentation, 10%; Syndicate group project, 40%; Research report, 50%.

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**EQB5611 RISK ASSESSMENT AND HUMAN BEHAVIOUR**

**Campus** Werribee

**Prerequisite(s)** Nil

**Content**

**Required Reading**

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**EQB5621 FIRE GROWTH, DETECTION AND EXTINGUISHMENT**

**Campus** Werribee

**Prerequisite(s)** Nil

**Content**
The subject provides students with basic information on fire technology and explains the initiation and development of fires including an understanding and facility in the application of the range of detection systems and of manual and automatic extinguishing subsystems in terms of: mechanism of extinguishment; detection performance; component modelling; response time assessment; reliability criteria, redundancy and the effect of maintenance; performance testing. The subject covers the combustion process and the fire triangle. Heat transfer mechanism, combustion of gases and vapours and fire plumes. Combustion of liquids and solids, fire toxicity and products of combustion. Fire behaviour of materials and products and fire retardants, fire test methods. Fire initiation and development. Pre and Post flashover enclosure fires. Mathematical modelling of enclosure fires (zone and field models). Management of fire initiation and development and implications to performance design. Detection and extinguishment, principles of detection and alarm. Fire detection and alarm systems, water based extinguishment. Fire engineering design for extinguishment, system reliability. Fire brigade response and operations.

**Required Reading**

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**EQB5632 SMOKE AND FIRE SPREAD, FIRE SAFETY SYSTEM DESIGN**

**Campus** Werribee

**Prerequisite(s)** Nil

**Content**

**Required Reading**

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**EQB5642 PERFORMANCE CODES METHODOLOGY AND STRUCTURE**

**Campus** Werribee

**Prerequisite(s)** Nil
Content The subject introduces the student to the principles, methodology and scope of performance based codes including a conceptual framework and historical background and provides the student with an understanding of the structure of performance design and approval and background and refresher material essential to an understanding of further subjects in the course.


EQB5751 FIRE TECHNOLOGY MODELLING

Campus Werribee

Prerequisite(s) EQB5621 and EQB5632

Content The subject provides students with an understanding of the details of modelling of active, and passive, building fire safety subsystems, and the details of human behaviour modelling. The subject covers detection and sprinkler operation predictions; modelling of barrier failure; structural fire safety; human behaviour modelling; suppression models; and a fire brigade intervention model.


Class Contact Equivalent to three hours of lectures per week for thirteen weeks.

Assessment Four written assignments, 10%, 10%, 30% and 50%. Page limits: 10% – 4 pages, 30% – 12 pages, 50% – 20 pages.

EQB5761 FIRE SAFETY SYSTEMS MODELLING

Campus Werribee

Prerequisite(s) EQB5611, EQB5621 and EQB5632

Content The subject provides students with an understanding of the details of modelling of active, and passive, building fire safety subsystems, and the details of human behaviour modelling. The subject covers detection and sprinkler operation predictions; modelling of barrier failure; structural fire safety; human behaviour modelling; suppression models; and a fire brigade intervention model.


Class Contact Equivalent to three hours of lectures per week for thirteen weeks.

Assessment Four written assignments, 10%, 10%, 30% and 50%. Page limits: 10% – 4 pages, 30% – 12 pages, 50% – 20 pages.

EQB5772 FIRE SAFETY SYSTEM DESIGN

Campus Werribee

Prerequisite(s) Fire Safety System Design: EQB5751, EQB5761 and EQB5642.

Content The subject provides a description of various approaches used for the design of the safety in buildings, with particular emphasis placed on a fire safety system (FSS) performance model. The FSS model uses a risk assessment methodology to assess the risk to life safety and the expected losses, and to incorporate this risk assessment as part of the design procedure for the fire safety in buildings. The subject covers: introduction, alternative design approaches, fire engineering design code framework, risk assessment methodology, and description of a fire safety system (FSS) model and its parameters; risk to life submodel and economic submodel. Description of the various submodels comprising the FSS model-namely: fire initiation and growth submodel, smoke spread submodel, fire spread submodel, occupant communication and avoidance submodel, fire brigade submodel. In-service performance. Application of fire safety system models.


Class Contact Three hours of lectures per week for one semester.

Assessment Assessment will be made on the basis of assignments. Four assignments, each 25%. Supplementary assessment will not be available.

EQB5782 FIRE SPREAD AND FIRE SAFETY SYSTEM DESIGN PROJECT

Campus Werribee
Prerequisite(s) Fire Spread and Fire Safety System Design Project.
Co-requisite(s) EQB5772 Fire Safety System Design.
Content The first part of this subject provides an understanding of the mechanisms of and impediments to the spread of fire in buildings, and to provide a knowledge of the behaviour, analysis and design of the available subsystems for the management of fire spread. The subject covers: introduction and overview; reliability of smoke and fire management subsystems; mechanisms, timing and probability of fire spread; modelling fire spread; fire spread management subsystem; design of fire spread subsystem. In the second part of the subject Fire Safety System design project will apply knowledge gained during the course to the analysis and design of a cost-effective fire safety system for a proposed building project.


Class Contact Three hours of lectures per week for one semester.
Assessment Assessment will be on the basis of submission of required assignments and a project. Assessment of the Fire Safety System Project will be on the basis of submission of a major report. Project submission, 70%; assignments, 30%. Supplementary assessment will not be available.

EQT6050 BUILDING FIRE RESEARCH (FULL-TIME)
Campus Werribee
Prerequisite(s) Students are normally expected to have completed the Graduate Diploma in Building Fire Safety and Risk Engineering with an Honours average.
Content The thesis will normally be from 15,000 to 25,000 words. It will report on independently conducted research which demonstrates the student's ability to clearly define a problem, to undertake a detailed literature search and review the literature on the topic area. The student shall, where appropriate, demonstrate both the ability to develop and/or apply models to study the problem together with appropriate data selection, collection and analysis. Students will normally be supervised by an academic member of staff and by a co-supervisor external to the Centre. The external supervisor will be an academic from the University or from another institution or a practitioner.
Required Reading To be advised by lecturer.
Class Contact Regular contact will be made by arrangement with the supervisor.
Assessment Before commencing actual research, students must complete, to the satisfaction of the research supervisor, a paper critically reviewing the literature and providing a clear outline of the proposed research methodology and resources required to complete the thesis. The final thesis will be assessed by two examiners with expertise in the area of the research. These examiners may be internal or external to the Centre or the University and will not include the supervisors. Students may be asked to present themselves for oral or written examination by these examiners, at the examiner's discretion.
HN M636 ETHICS AND MEDICAL PRACTICE
Campus Footscray Park
Prerequisite(s) Nil.
Content This subject examines significant ethical issues in medical practice, including the question of a discipline-based ethical knowledge. The relationships between society, ethics, the law and professional practice are examined through analysis of contemporary ethical, legal, social and professional issues. The subject considers the use of different ethical frameworks to justify moral judgements and includes analysis of issues affecting nurses’ capacity to practice ethically.
Required Reading To be advised by lecturer.
Recommended Reading Australian Nursing Council Incorporated 1993, Code of Ethics for Nurses in Australia, Canberra; Bandman, E.L. and Bandman, B., 1995, Nursing Ethics Throughout the Lifespan, 3rd edn, Appleton and Lange, Norwalk, CT.
Class Contact Three hours per week for one semester comprising 1 two-hour lecture-led seminar, followed by one 1 hour tutorial.
Assessment Group project which includes a class presentation 40%; analysis of a case study or practice issue – 2,500 words 60%.

SBF6710 FOOD ANALYSIS
Campus Werribee
Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.
Content This subject provides an introduction to the laboratory analysis of the chemical, physical and biochemical properties of foods and food components. The subject covers: the reasons for analysing foods; food composition tables and databases; sampling and sample preparation; the proximate analysis system; water activity; analyses of proteins, carbohydrates, lipids, vitamins, minerals and pigments; the use of enzyme based assays for food components; rheology, texture, viscosity and colour of foods – principles and recent developments in analysis; enzymes as processing aids and as deteriorative agents – measurement of food enzymes.
Class Contact Three hours per week comprising two hours of lectures/tutorials and one hour of practical laboratory work for one semester.
Assessment Assignments and tests 30%, practical work 20%, final examination 50%.

SBF6720 FOOD MICROBIOLOGY
Campus Werribee
Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.
Class Contact Six hours per week comprising three hours of lectures and tutorials and three hours of practical work for one semester.
Assessment Assignments and tests 30%, Practical work 20%, final examination 50%.

SBF6721 FRUIT AND VEGETABLE SCIENCE AND TECHNOLOGY
Campus Werribee
Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.
Content This subject introduces students to the principles and technology of fruit and vegetable processing and to recent developments in the processing of these commodities. Topics covered include: The fruit and vegetable industry: plant physiology; the biochemistry of fruit ripening; diseases; maturity prediction and testing; post-harvest handling and storage; chilling and freezing, canning, microwave processing, cooking and dehydration; changes in quality. The juicing of fruit and vegetables, product deterioration, blanching treatments, product quality, quality assurance, and legal requirements.
Required Reading To be advised by lecturers.
Class Contact Six hours per week comprising lectures, tutorials, practical work and/or field trips for one semester.
Assessment Assignments and tests 30%, practical work 20%, final examination 50%.225
SBF6722 GRAIN SCIENCE AND TECHNOLOGY

Campus Werribee

Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.

Content This subject provides an introduction to the principles and practice of the science and technology of cereals and legumes. Topics covered include: The principles of the industry; Understanding the chemical, physical, and nutritional characteristics of cereals and legumes; The use of technology in the processing and storage of cereals and legumes; The role of cereals and legumes in human nutrition; The impact of modern technology on the food industry; The role of technology in the future of the food industry.

Class Contact Six hours per week comprising lectures, tutorials, practical work and/or field trips for one semester.

Assessment Assignments and tests 30%, practical work 20%, final examination 50%.

SBF6723 MUSCLE FOOD SCIENCE AND TECHNOLOGY

Campus Werribee

Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.

Content This subject provides an introduction to the principles and practice of the science and technology of muscle foods. Topics covered include: The principles of meat science; Understanding the chemical, physical, and nutritional characteristics of muscle foods; The role of technology in the processing and storage of muscle foods; The impact of modern technology on the food industry; The role of technology in the future of the food industry.

Class Contact Six hours per week comprising lectures, tutorials, practical work and/or field trips for one semester.

Assessment Assignments and tests 30%, practical work 20%, final examination 50%.

SBF6724 DAIRY SCIENCE AND TECHNOLOGY

Campus Werribee

Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.

Content This subject provides an introduction to the principles and practice of the science and technology of dairy products. Topics covered include: The principles of dairy science; Understanding the chemical, physical, and nutritional characteristics of dairy products; The role of technology in the processing and storage of dairy products; The impact of modern technology on the food industry; The role of technology in the future of the food industry.

Class Contact Six hours per week comprising lectures, tutorials, practical work and/or field trips for one semester.

Assessment Assignments and tests 30%, practical work 20%, final examination 50%.

SBF6730 PRESERVATION AND PROCESSING TECHNOLOGY

Campus Werribee

Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.

Content This subject provides an introduction to the principles and practice of the science and technology of the preservation and processing of foods. Topics covered include: The principles of preservation and processing; Understanding the chemical, physical, and nutritional characteristics of foods; The role of technology in the processing and storage of foods; The impact of modern technology on the food industry; The role of technology in the future of the food industry.

Class Contact Six hours per week comprising lectures, tutorials, practical work and/or field trips for one semester.

Assessment Assignments and tests 30%, practical work 20%, final examination 50%.

SBF6740 SPECIAL TOPICS IN FOOD TECHNOLOGY

Campus Werribee

Prerequisite(s) Eligibility for entry to the Master of Science in Food Science and Technology.

Content This subject allows students to develop and study a selected aspect of food science and technology and requires the conduct of a project on the selected topic. This project is not laboratory based but is designed to allow students to research the
literature on a topic of interest to themselves. The project will be carried out on an individual basis under the supervision of a Food Technology staff member of the School of Life Sciences and Technology and a member of industry where appropriate. The subject includes: Design and development of the study; collection and analysis of data and submission of a written report. Presentation of a seminar on the topic. Subject to approval, the project may be related to the students’ work situation and/or may involve plant based work.

**Required Reading** Students will be responsible for reviewing the current literature on their project topic.

**Class Contact** Three hours per week comprising tutorial work and self-directed learning activities for one semester.

**Assessment** Oral presentation 20%; Written report 80%.

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### SBF6745 FOOD PRODUCT DEVELOPMENT

**Campus** Werribee

**Prerequisite(s)** Eligibility for entry to the Master of Science in Food Science and Technology.

**Content** This subject provides an introduction to the systematic methods used in the development of new products, market research, product design and specification and evaluation of product development project. This subject covers: Development of aims, objectives and constraints; Collection and analysis of marketing and technical information required for product development; Product idea generation; Screening of new product ideas; Product concept development and testing; Marketing-strategy development; Product development process (project planning, formulation development, process development, shelf-life testing); Consumer testing; Market trial methods and estimation of market size; Product specifications (raw materials, process, finished product); Packaging and labelling; product evaluation, product costing and pricing; Production planning; Market development and product launch.


**Class Contact** Six hours per week comprising lectures/tutorials and practical work for one semester.

**Assessment** Assignments and tests 20%, practical work 20%, final examination 60%.

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### SBF6910 MINOR PROJECT

**Campus** Werribee

**Prerequisite(s)** Eligibility for entry to the Master of Science in Food Science and Technology.

**Content** This subject allows students to conduct a research project of their own design, analyse and interpret data and communicate research findings clearly and concisely in both oral and written form. This subject covers: Conduct of a project on an aspect of food science and technology; Design and development of the study, collection and analysis of data and submission of a written report; Presentation of a seminar on the research work. Subject to approval, the project may be related to the student’s work situation and/or may involve laboratory or plant based work.

**Required Reading** Students will be responsible for reviewing the current literature on their project topic.

**Class Contact** Six hours per week of laboratory/tutorial work for one semester.

**Assessment** Oral Presentation 20%, Written reports 80%.

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### SBF6920 MAJOR PROJECT

**Campus** Werribee

**Prerequisite(s)** Eligibility for entry to the Master of Science in Food Science and Technology.

**Content** In this subject students will conduct a research project of their own design, analyse and interpret data and communicate research findings clearly and concisely in both oral and written form. The project will be carried out on an individual basis under the supervision of a Food Technology staff member of the School of Life Sciences and Technology and a member of industry where appropriate. The subject involves: Conduct of a project on an aspect of food science and technology; Design and development of the study, collection and analysis of data and submission of a written report; Presentation of a seminar on the research work. Subject to approval, the project may be related to International food standards codes, food hygiene regulations, micro-biological standards and codes of practice, the development and underlying principles of food standards, Codex standards, export standards; food additives, types, functions, toxicological evaluation and regulations governing usage; toxic substances and contaminants; hygiene and sanitation in food processing and production, techniques for evaluation of food processing plants; quality assurance principles and systems: parameters of food quality and its evaluation and control, role of quality assurance, concepts of total quality control (TQC) and total quality management (TQM), good manufacturing practice, sampling plans, specification writing, hazard analysis and critical control point (HACCP) concept, product recall procedures, Australian and International quality systems.

**Required Reading** To be advised by lecturers.

the student's work situation and/or may involve laboratory or plant based work.

**Required Reading** Students will be responsible for reviewing the current literature on their project topic.

**Class Contact** Twelve hours per week of laboratory/tutorial work for one semester or Six hours per week of laboratory/tutorial work for two semesters.

**Assessment** Oral presentation 20%, Written reports 80%.

### SBT8000 RESEARCH THESIS (FULL-TIME)

**Campus** Werribee

**Prerequisite(s)** Eligibility for entry to a Master of Science or Doctor of Philosophy program.

### SBT8010 RESEARCH THESIS (PART-TIME)

**Campus** Werribee

**Prerequisite(s)** Eligibility for entry to a Master of Science or Doctor of Philosophy program.

### SCM3614 EXPERIMENTAL DESIGN 1

**Campus** Werribee

**Prerequisite(s)** Eligibility for entry to the Master of Science in Food Science and Technology.

**Content** This subject provides an introduction to the principles of experimental design and interpretation of data. The subject covers: The differences between experiments and observational studies; Completely randomised and randomised block experiments; Two level factorial and fractional factorial designs; Analysis of variance; Response surface designs and analysis; An introduction to designs with factors at more than two levels; Research ethics.

**Required Reading** To be advised by lecturers.

**Class Contact** Three hours per week comprising two one-hour lectures and one one-hour laboratory/tutorial for one semester.

**Assessment** Assignments and tests 30%, final examination 70%.

### SCM5404 FINANCIAL DECISION SUPPORT SYSTEMS

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** This subject focuses on modelling the financial flows associated with investment both in commercial projects and in financial assets. Topics may include: the riskless investment: compound interest, present-value and future-value of a sequence of dated cash-flows, measures of rate-of-return; the single-period risky investment, the Markowitz mean-variance comparison of investments; reduction of risk through portfolio optimisation; the capital asset pricing model; extension to multi-period risky investments; financial instruments underlying sources of finance, bonds, shares, options, futures, currencies; Black/Scholes pricing of options; interest rate risk (duration and convexity); software-packages for financial modelling.


**Class Contact** Three hours per week comprising two hours of lectures and one one-hour tutorial.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5602 QUALITY MANAGEMENT AND STATISTICS

**Campus** Werribee

**Prerequisite(s)** Nil.

**Content** Quality as an integral part of the business environment. Statistical process control: Pareto analysis, standards, process capability, control charts, acceptance sampling.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester comprising lectures and tutorials.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5800 OBJECT ORIENTED PROGRAMMING GD1

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** Nil.

**Content** Programming language; basic object oriented concepts; programming, algorithm development and elementary data structures objects and classes.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising two hours of lectures and one one-hour practical.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5802 INFORMATION SYSTEMS

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** Nil.

**Content** Database concepts and design methodology; hierarchical, network and relational models; relational approach and relational calculus; object-oriented approach to database design; conceptual models and query interfaces; database...
management and administration functions, shared access control, security, recovery and query interfaces; study and use of fourth generation languages for query, update and report generation.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising two hours of lectures and one one-hour practical.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5803 DATA STRUCTURES AND PROGRAMMING

**Campus** Footscray Park

**Prerequisite(s)** SCM5800 Object Oriented Programming GD1

**Content** Program development and testing using Software Engineering principles; object oriented programming languages; organisation and manipulation of data; the software environment; object oriented design and analysis.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising one one-hour lecture and one two-hour practical.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5804 SOFTWARE ENGINEERING

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** Nil.

**Content** Introduction to software engineering; the lifetime of software systems; requirements definitions and specifications and feasibility; software design and programming languages; testing and debugging; documentation of software systems; the user interface; software quality assurance; software management and project management.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising one one-hour lecture and one two-hour practical.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5805 COMMUNICATION AND NETWORKS

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** Nil.

**Content** Introduction – types of networks, master/slave polling networks, equality networks, circuit switches and packet switched networks, topologies, network structure, costs; layered design of networks and the ISO reference model – protocols, interfaces, communication techniques, multiplexing; public networks in Australia – Datel, DDS, Austpac, etc.; local area networks – transmission media, topologies, access control, comparison of local area network products; PC Networks – servers, workstations, network disks, directory structure, network security, access control and file locking.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising two hours of lectures and one one-hour laboratory work.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5807 ADVANCED INFORMATION SYSTEMS

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** SCM5802 Information Systems or equivalent.

**Content** Data analysis and modelling using the entity-relationship model. Transaction analysis and management: transaction concept and properties, concurrency control, transaction logging and database recovery. Database application development: embedded SQL, form-based approach.

**Required Reading** To be advised by lecturer.

**Class Contact** Two hour lecture and one hour laboratory/tutorial per week.

**Assessment** Final examination, 80%; assignment and test, 20%.

### SCM5810 OPERATING SYSTEMS

**Campus** Footscray Park, Hong Kong

**Prerequisite(s)** Nil.

**Content** Operating Systems, system structure, memory management, process management, concurrent processes, resource allocation, protection, advanced architecture and operating systems, implementations; operating environment for application programs, job control languages, job streams, check points, utilities and system routines, discussion of why the operating system exists and the practical consequences.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising two hours of lectures and one one-hour practical.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5813 ARTIFICIAL INTELLIGENCE

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** LISP; knowledge representation – semantic nets, problem solving, search, frames; knowledge based systems – rule-based systems; logic programming; developing an expert system.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising two hours of lectures and one one-hour practical.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM5819 COBOL PROGRAMMING

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** Advanced Programming, programming language, structured programming concepts; data organisation and accessing, file processing environment, sequential access, random access, file input-output, implementation considerations; design techniques, formal models of structured programming, demonstration of code reading and correctness; stepwise refinement, reorganisation and segmentation; top-down design and development, structured design, strength and coupling measures.

**Required Reading** To be advised by lecturer.

**Class Contact** Three hours per week for one semester comprising two hours of lectures and one one-hour practical.
SCM5824 OBJECT ORIENTED PROGRAMMING GD2

Campus: Footscray Park, Hong Kong

Prerequisite(s): SCM5800 Object Oriented Programming GD1

Introduction to Computer Science or equivalent.

Content: This subject provides practice to object oriented programming and methodology using advanced features and the application programming interface of the Java programming language. A deeper discussion of classes and objects, encapsulation, polymorphism, inheritance, relationships among classes of objects and programming with related classes along with exception handling, multithreading, file I/O and building GUI components.

Required Reading: To be advised by lecturer.

Class Contact: Three hours per week for one semester comprising two hours of lectures and one one-hour laboratory.


Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM5901 INTRODUCTION TO DECISION SUPPORT SYSTEMS

Campus: Footscray Park

Prerequisite(s): Nil.


Required Reading: To be advised by lecturer.

Class Contact: Three hours per week for one semester comprising two hours of lectures and one hour tutorial.

Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM5903 SYSTEMS AND SIMULATION STUDIES

Campus: Footscray Park

Prerequisite(s): Nil.

Content: Philosophy and concepts of simulation; discrete and continuous event simulation of physical systems; modeling of transactions, resources and queues; analysis and design of simulation experiments. Practical program will involve building and implementing production, inventory control and general queuing models using SLAM II simulation language.

Required Reading: To be advised by lecturer.

Class Contact: Three hours per week for one semester comprising one one-hour lecture and two hours of tutorial.

Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6801 INDUSTRY PROJECT

Campus: Footscray Park

Prerequisite(s): Nil.

Content: The project work gives the students: an opportunity to work on a complex real-life problem; experience in liaising with industrial personnel from various sections of the sponsoring
company; experience at defining a problem in precise terms; experience in searching the literature and using library facilities; experience at presenting reports in both written and verbal forms. In all cases, students operate individually under the supervision of a staff member and tackle a problem using appropriate methods of statistical analysis. Typical project areas are: multivariate data analysis; quality control studies; econometric modelling; time series forecasting; reliability modelling; design and analysis of experiments; production scheduling; A.I. application in industry; database construction; systems analysis and design; development of expert systems.

**Required Reading** To be advised by lecturer.

**Class Contact** Six hours per week for one semester comprising individual supervision.

**Assessment** Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

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<tr>
<th>Subject</th>
<th>Campus</th>
<th>Prerequisite(s)</th>
<th>Content</th>
<th>Required Reading</th>
<th>Class Contact</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>SCM6501 IMAGE PROCESSING ALGORITHMS</td>
<td>Footscray Park</td>
<td>Nil</td>
<td>An introductory subject which covers the fundamental algorithms used in imaging. The topics include: point, algebraic and geometric operations; smoothing and edge detection, linear convolution, median and max/min filters, non-linear edge detection; shape detection algorithms, segmentation, template matching, Hough methods, morphological operations; texture generation and recognition; colour space; image coding and compression; three dimensional reconstruction.</td>
<td>To be advised by lecturer.</td>
<td>Three hours per week for one semester comprising lectures/practicals/tutorial.</td>
<td>Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.</td>
</tr>
<tr>
<td>SCM6502 MATHEMATICS OF IMAGE PROCESSING</td>
<td>Footscray Park</td>
<td>Nil</td>
<td>An introduction to the many mathematical concepts and techniques used in image processing. The following topics will be included: Set Theory: continuous and discrete sets, topology, morphology, mensuration; similarities and differences between continuous and discrete space. Linear Algebra: theory of vector spaces; metrics, Banach and Hilbert space; transformations; matrix decomposition; affine and projective geometry. Transform Theory: the Fourier transform in one and two dimensions; discrete and fast Fourier transforms; other transforms especially the cosine, Hilbert, and wavelet transforms and singular value decomposition.</td>
<td>To be advised by lecturer.</td>
<td>Three hours per week for one semester comprising lectures/practicals.</td>
<td>Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.</td>
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<tr>
<td>SCM6503 STATISTICAL IMAGE PROCESSING</td>
<td>Footscray Park</td>
<td>Nil</td>
<td>This is a subject covering probability and statistics most relevant to image processing. The topics include: stochastic and deterministic processes stochastic fields, Wiener processes; iterated function systems, self-similarity, fixed point behaviour and chaos; estimation theory, multivariate analysis, discriminant analysis, autoregressive models; fuzzy logic, belief systems and inference.</td>
<td>To be advised by lecturer.</td>
<td>Three hours per week for one semester comprising lecture/practicals/laboratories.</td>
<td>Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.</td>
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<tr>
<td>SCM6601 RELIABILITY AND MAINTENANCE</td>
<td>Footscray Park</td>
<td>Nil</td>
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</table>
### Content
This subject studies the important interrelated topics of system reliability, maintainability and availability. A statistical approach is taken and methods are tempered to meet practical considerations. Introduction: Historical perspective of reliability, fundamental concepts, analysis of Failure data. Combinatorial system reliability, Bayesian methods in reliability analysis, analysis of failure data in maintained systems, replacement strategies, techniques for reliability analysis of complex systems, distributed system reliability, software systems available for reliability and maintenance, software reliability models.

### Required Reading
To be advised by lecturer.

### Class Contact
Three hours per week for one semester comprising lectures/tutorials.

### Assessment
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM6602 STOCHASTIC PROCESSES

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<tr>
<td>Prerequisite(s)</td>
<td>Nil</td>
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</table>

**Content**
This subject is an overview of stochastic processes. Some important topics in the theory of such processes are dealt with. The processes considered have been chosen because they have found application in various branches of science and technology. Computer Science and Operations Research applications are particularly emphasised. The subject consists of:

- Markov Chains: Transition probabilities, classification of states, absorption probabilities. Markov chains and Martingales occurring in branching, queuing with applications in computer science and operations research.
- Congestion Theory: Loss and waiting systems in networks.

**Required Reading**
To be advised by lecturer.

**Class Contact**
Three hours per week for one semester comprising lecture and tutorial.

**Assessment**
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM6603 STATISTICAL CONTROL OF CONTINUOUS PROCESSES

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<th>Campus</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>SCM6602 Quality Management and Statistics or equivalent.</td>
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</tbody>
</table>

**Content**

**Required Reading**
To be advised by lecturer.

**Class Contact**
Three hours per week for one semester comprising lectures/tutorials.

**Assessment**
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM6604 EXPERIMENTAL DESIGN 2

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<th>Campus</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>SCM6604 Experimental Design 1 or equivalent.</td>
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</tbody>
</table>

**Content**
This subject is an overview of stochastic processes.

**Required Reading**
To be advised by lecturer.

**Class Contact**
Three hours per week for one semester comprising lectures and tutorials.

**Assessment**
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM6605 REGRESSION ANALYSIS 2

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<th>Campus</th>
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<tbody>
<tr>
<td>Prerequisite(s)</td>
<td>Regression Analysis 1 or equivalent.</td>
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</table>

**Content**
Review of Linear regression; the geometry of linear least squares; nonlinear regression: Nonlinear least squares; Gauss-Newton procedure for estimates; the geometry of nonlinear regression; nonlinear regression inference using the linear approximation; practical considerations in Nonlinear regression; introduction to nonnormal error structures: Logistic and Poisson regression; generalised linear models.

**Required Reading**
To be advised by lecturer.

**Class Contact**
Three hours per week for one semester comprising lecture and tutorial.

**Assessment**
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

### SCM6606 TIME SERIES ANALYSIS

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<th>Campus</th>
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<tr>
<td>Prerequisite(s)</td>
<td>SCM6606 Time Series Analysis 1 or equivalent.</td>
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</table>

**Content**
An advanced subject in time series analysis. It consists of the following topics: review of forecasting techniques including ARIMA modellings spectrum analysis, spectral density Fourier transforms; transfer functions, cross-correlations, linear systems, forecasting; intervention analysis, model identification, estimation; use of computer packages such as SAS; review of current literature.

**Required Reading**
To be advised by lecturer.

**Class Contact**
Three hours per week for one semester comprising lectures and tutorials.

**Assessment**
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.
SCM6607 STATISTICAL COMPUTING
Campus Footscray Park
Prerequisite(s) Nil.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester comprising lecture and practical.
Assessment Will be based on a combination of examination, assignments, and presentations according to a formula to be provided during the first week of classes.

SCM6608 MULTIVARIATE ANALYSIS
Campus Footscray Park
Prerequisite(s) Nil.
Content This subject extends the concepts of estimation and statistical analysis to handle problems involving many dependent variables. Some of the more commonly used multivariate statistical procedures are presented in detail. The topics consist of: Covariance and Correlation: Population and sample covariance and correlation matrices; properties and tests. Linear combinations and multiple and partial correlation. Multivariate Normal Distribution: Features, properties and the key role it plays in many multivariate statistical procedures. Tests on mean vectors. Specific Procedures: Multivariate multiple regression, required reading
Testing assumptions about data distributions. Practical program: laboratory sessions are designed to give students practical experience in using computers for statistical purposes.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester comprising lecture and practical.
Assessment Will be based on a combination of examination, assignments, and presentations according to a formula to be provided during the first week of classes.

SCM6701 MATHEMATICS FOR COMPUTER SCIENCE
Campus Footscray Park
Prerequisite(s) Nil.
Content Formal system; propositional calculus; predicate calculus; theories, set theory; relations; functions; sequences; algebras; formal methods; Z-notation.
Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising two hours of lectures, and one one-hour tutorial.
Assessment Will be based on a combination of examination, assignments, and presentations according to a formula to be provided during the first week of classes.

SCM6801 OBJECT ORIENTED TECHNOLOGY 1
Campus Footscray Park, Hong Kong
Prerequisite(s) Nil.
Content Object oriented concepts: classes, inheritance, polymorphism, encapsulation. Program design and implementation using object oriented methodology. Persistent objects and object oriented data bases. Comparison of object oriented languages.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester comprising two hours of lectures and one one-hour tutorial.
Assessment Will be based on a combination of examination, assignments, and presentations according to a formula to be provided during the first week of classes.

SCM6802 OBJECT ORIENTED TECHNOLOGY 2
Campus Footscray Park, Hong Kong
Prerequisite(s) SCM6801 Object Oriented Technology 1 or equivalent.
Content Review of object-oriented systems inheritance, data and procedure encapsulation, messaging graph structures. Object-oriented languages. Object-oriented design. Impact of object-oriented design strategies on software development. Applications of object-oriented design in areas such as Artificial Intelligence, Database systems and user interfaces.
Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester comprising two hours lecture and one one-hour tutorial.
Assessment Will be based on a combination of examination, assignments, and presentations according to a formula to be provided during the first week of classes.

SCM6803 SOFTWARE ENGINEERING 1
Campus Footscray Park
Prerequisite(s) SCM5800 Object Oriented Programming GD1 Introduction to Computer Science; SCM5803 Data Structures and Programming or equivalent.
Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising lectures/practical exercises/class discussions and projects.
Assessment Will be based on a combination of examination, assignments, and presentations according to a formula to be provided during the first week of classes.

SCM6804 SOFTWARE ENGINEERING 2
Campus Footscray Park
Prerequisite(s) SCM6803 Software Engineering 1 or equivalent.
Content Each student will work on a project as a member of a team. Students will be required to present a written report and give an oral presentation at the end of semester. Projects will focus on industrial and business applications and can be chosen from one of the following fields: user interface development; database management systems; networking; parallel processing; artificial intelligence; general application development environments.
Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising mainly of software development project.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6805 ARTIFICIAL INTELLIGENCE 1
Campus Footscray Park
Prerequisite(s) Nil.
Content Traditional programming versus artificial intelligence/expert systems; applications of artificial intelligence/expert systems; problem solving, classification, diagnosis, interpretation, monitoring, synthesis, planning, design; artificial intelligence/expert systems programming tools; practical work with one of PROLEG/LISP/SMALLTALK/OPS-5; multi-paradigm tools, ES shells; knowledge engineering techniques; knowledge representations in AI and operations research; using artificial intelligence/expert systems; commercial applications.

Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising lectures/seminars/workshops.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6806 ARTIFICIAL INTELLIGENCE 2
Campus Footscray Park
Prerequisite(s) SCM6805 Artificial Intelligence 1 or equivalent.
Content Advanced LISP/Prolog programming techniques; nondeterministic programming. Incomplete data structures; search techniques. Applications: implementing natural language processing, finite state techniques, recursive and augmented transition networks, grammars, chart parsing, semantics, data base query languages, pragmatics. Selection of current research topics in AI: symbolic computation, neural nets, computer integrated manufacturing, expert systems.

Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising lectures/seminars/workshops.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6807 KNOWLEDGE ENGINEERING 1
Campus Footscray Park, Hong Kong
Prerequisite(s) Nil.
Content A study of various methodologies to represent knowledge, and to design and implement knowledge based systems. Topics include: knowledge, general concepts, knowledge organisation, knowledge processing; knowledge representation, formalised symbolic logics, reasoning under uncertainty, structured knowledge and data structures, object-oriented representations; knowledge organisation and manipulation, search and control strategy; memory techniques; knowledge engineering techniques, knowledge acquisition, knowledge representations in AI and applications.

Required Reading To be advised by lecturer.
Class Contact Three hours per week for one semester comprising lectures/seminars/workshops.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6809 PARALLEL PROCESSING 1
Campus Footscray Park
Prerequisite(s) SCM5800 Object Oriented Programming GD1, Introduction to Computer Science or equivalent.
Content Introduction to parallel processing: evolution of computer systems, parallelism in uniprocessor systems, parallel computer structures, architectural classification schemes, parallel processing applications. Introduction to parallel programming: sequential programming languages, asynchronous parallel programming languages, synchronous parallel programming languages, data flow languages. Parallel machines: Transputer, Connection Machine, CRAY Machines. Parallel programming: OCCAM, Parallel-C.

Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising two hours of lecture/tutorial and one one-hour laboratory.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6810 PARALLEL PROCESSING 2
Campus Footscray Park
Prerequisite(s) SCM6809 Parallel Processing 1 or equivalent.
Content Models of parallel processing: classical computational models, parallel computational models, dataflow and related models; models for synchronous computers; analysis and semantics of parallel processes, fundamentals of semantics of concurrency, semantics of Petri net models, tree semantics, power domain semantics, actor semantics; complexity and speed-up in parallel computations; realisation of parallel machines; universal interconnection patterns; VLSI computational complexity; physical complexity and neural networks; parallel processing of databases; modelling and analysis of concurrency in database systems; database architecture and languages.

Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising two hours of lectures/tutorials and one one-hour laboratory.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6811 INFORMATION NETWORKING 1
Campus Footscray Park
Prerequisite(s) SCM5805 Communications and Networks or equivalent.
Content Introduction to information networks; communication fundamentals; communication protocols; network architectures; network design; modelling and simulation of networks; network services; network management.

Required Reading To be advised by lecturer.
Class Contact Three hours per week comprising two hours of lectures and one one-hour tutorial.
Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6812 INFORMATION NETWORKING 2
Campus Footscray Park
Prerequisite(s) SCM6811 Information Networking 1 or equivalent.
Content

SCM6813 DATA MANAGEMENT 1

Campus Footscray Park

Prerequisite(s) SCM5800 Object Oriented Programming GD1; SCM5801 Introduction to Computer Science; SCMS803 Data Structures and Programming or equivalent.

Content

Amortized analysis; self-adjusting data structures, e.g. AVL and splay trees; multiway search trees, e.g. B-trees; range queries; data compression; dynamic structures, e.g. extendible and linear hashing; partial match retrieval.

Required Reading

To be advised by lecturer.

Class Contact

Three hours per week comprising two hours of lecture and one one-hour tutorial.

Assessment

Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6814 DATA MANAGEMENT 2

Campus Footscray Park, Hong Kong

Prerequisite(s) SCM6813 Data Management 1 or equivalent.

Content

Relational database systems. Relational algebra and calculus, relational query processing and optimisation. Inadequacies of the relational model. Deductive database systems design; Semantic data modelling; Object-oriented database systems.

Required Reading

To be advised by lecturer.

Class Contact

Three hours per week comprising two hours lecture and one-one hour tutorial.

Assessment

Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6815 THEORETICAL COMPUTER SCIENCE 1

Campus Footscray Park, Hong Kong

Prerequisite(s) Undergraduate studies in mathematics up to and including at least one unit at second-year level.

Content


Required Reading

To be advised by lecturer.

Class Contact

Three hours per week comprising two hours of lectures and one one-hour tutorial.

Assessment

Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6817 SYSTEMS MODELLING WITH PETRI NETS

Campus Footscray Park

Prerequisite(s) Nil.

Content


Required Reading


Class Contact

Three hours per week for one semester comprising lecture/tutorial.

Assessment

Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6818 DATA STRUCTURES AND PROGRAMMING

Campus Footscray Park, Hong Kong

Prerequisite(s) SCM5800 Object Oriented Programming GD1 Introduction to Computer Science or equivalent.

Content

Pointers, structures, pointers to functions, dynamic memory allocation; recursion, abstract data types, polymorphism, software development, complexity; lists, stacks and queues, circular and doubly-linked lists; binary trees, heaps, graphs; sets, searching and sorting. Practical Program Laboratory and tutorial sessions designed to give students practical experience in developing application software.

Required Reading

To be advised by lecturer.

Class Contact

Three hours per week for one semester comprising two hours lecture and one-hour laboratory/tutorial per week.

Assessment

Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6819 USER INTERFACE DESIGN

Campus Hong Kong, Footscray Park.

Prerequisite(s) SCM6822 Internet Programming

Content

Aspects of the process of designing, implementing, and evaluating user interfaces. Inputs to the process include systems analysis and task analysis. Outputs of the process include software systems.

Required Reading

To be advised by lecturer.

Recommended Reading


Class Contact

13 x 3 hour lectures/tutorials.

Assessment

Assignment, 40%; final examination, 60%.

SCM6820 DISTRIBUTED SYSTEMS

Campus Footscray Park, Hong Kong

Prerequisite(s) Nil.

Content

Aspects of the process of designing, implementing, and evaluating user interfaces. Inputs to the process include systems analysis and task analysis. Outputs of the process include software systems.

Required Reading

To be advised by lecturer.

Recommended Reading


Class Contact

13 x 3 hour lectures/tutorials.

Assessment

Assignment, 40%; final examination, 60%.

Assessment Final examination 70%. Assignment/Test 30%.

SCM6821 DECISION SUPPORT TECHNOLOGY

Campus Hong Kong, Footscray
Prerequisite(s) Nil.
Content Processes and phases of organisational decision making and modelling. Online analytic processing (OLAP) vs online transaction processing (OLTP); Decision support framework and applications. Data requirements and benefits of decision support systems. Structure, components and types of decision support systems. Data mining concepts. Data warehouse vs production systems. Warehouse data characteristics and requirements. Data fusion and data scrubbing. Data models for data warehouse and data mart. Star schemas and hypercubes. Multidimensional analysis ROLAP and MOLAP. Data warehouse administration. Warehouse database management technology.


Class Contact Three hours per week two hours lecture and one-hour laboratory/tutorial.

Assessment Final examination 70%. Assignment/Test 30%.

SCM6822 INTERNET PROGRAMMING

Campus Footscray Park, Hong Kong
Prerequisite(s) Competency in Java.

Required Reading D.R. Watson's five hypertexts on Internet Programming, all available on . the school's intranet at s:\samples\scm6822\Launcher.html or http://matilda.vu.edu.au/~dew/scm6822/ Launcher.html


Class Contact 2 hours lectures and 1 hour laboratory per week

Assessment Final Examination 70%, mid-semester practical test 30%.

SCM6823 DATABASE DESIGN, MANAGEMENT AND ADMINISTRATION

Campus Footscray Park, Hong Kong
Prerequisite(s) Nil.
Content Database Environment, Database planning, design and administration, Methodology – physical database design, Integrity and security, Transaction management and Distributed database systems.


Class Contact Two hour lectures and 1 hour laboratory/tutorial per week

Assessment Final Examination 80%, Assignment 20%.

SCM6830 KNOWLEDGE ENGINEERING AND E-COMMERCE TECHNOLOGY

Campus Footscray Park
Prerequisite(s) SCM6807 Knowledge Engineering 1 or equivalent.
Content A study of concepts involved in knowledge based systems (KBS). Development of techniques for KBS design and development with particular emphasis on practical implementations such as expert systems. Topics include: knowledge-based system life cycle; planning and designing a knowledge-based application; creating a knowledge-based application; prototyping, evaluation, pilot application, operational characteristics; knowledge representation; rule-based representations, frame-based reasoning, multiple contexts, model-based representations, blackboard representations; selection of appropriate knowledge representation techniques.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester comprising lectures/seminars/workshops.

Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6902 MATHEMATICAL PROGRAMMING 1

Campus Footscray Park
Prerequisite(s) Nil.
Content Overview of mathematical programming; review of linear constraints, convexity; the primal and dual problems; the simplex method, slack variables, optimality, post-optimality and sensitivity analysis, basis change, reduced basis, upper bounded variables; quadratic programs; integer (linear) programs; commercial packages for mathematical programming such as ‘Lindo’ and ‘Minos’.

Required Reading To be advised by lecturer.

Class Contact Three hours per week for one semester comprising lectures/tutorials.

Assessment Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6904 SIMULATION

Campus Footscray Park
Prerequisite(s) Nil.

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Content
Problem formulation using the concepts of entities, attributes, files, events etc. Generating random numbers from discrete and continuous distributions. Practical coding experience using SLAMI including debugging and verifying that the translated model executes as intended. Systems approach, flow diagram and problem analysis for discrete event systems. Network modelling involving queuing, resources, pre-emption, priorities and machine breakdown. Design and analysis of simulation experiments. Practical coding experience using SLAMI.

Required Reading
To be advised by lecturer.

Class Contact
Three hours per week for one semester comprising lectures/tutorials.

Assessment
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6905 SEQUENCING AND SCHEDULING

Campus
Footscray Park

Prerequisite(s)
Nil.

Content

Required Reading
To be advised by lecturer.

Class Contact
Three hours per week for one semester comprising lectures and tutorials.

Assessment
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6906 OPTIMISATION TECHNIQUES

Campus
Footscray Park

Prerequisite(s)
Nil.

Content
Lecture Program Topics: Dynamic programming and applications, network programming and applications, transportation problem, assignment problem, maximal flow problems, shortest-route problem, minimal spanning tree problem, estimating network flows, minimising the sum of absolute errors.

Required Reading
To be advised by lecturer.

Class Contact
Three hours per week for one semester comprising lectures/tutorials.

Assessment
Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

SCM6908 LOGISTICS FOR LOCATION AND DISTRIBUTION

Campus
Footscray Park

Prerequisite(s)
Nil.

Content
A review of traditional and current algorithms, computer packages and case studies for location and distribution in industry. Background to plant and warehouse location problems and their mathematical and computing models; heuristic methods for citing problems; mathematical programming formulations; algorithms for fixed-charge problems; partitioning and decomposition methods; commercial packages available for location problems; background to distribution and collection problems and their mathematical and computing models; basic heuristics for vehicle scheduling; mathematical programming approaches to vehicle scheduling; commercial packages available for vehicle scheduling.

Required Reading
To be advised by lecturer.

Class Contact
Three hours per week for one semester comprising lectures/tutorials.

Assessment
Assignments and project, 40%; final examination, 60%.

SCS5100 RESEARCH METHODOLOGY

Campus
Footscray Park

Prerequisite(s)
Nil.

Content
Experimental design, statistics in research, data analysis, computer applications and software, literature analysis and critical appraisal, ethics in research, scientific writing and data presentation. Qualitative data analysis.

Required Reading
To be advised by lecturer.

Recommended Reading

Class Contact
1 hour/week x 26 weeks – lectures and computer labs.

Assessment
Assignment only.

SCS5101 PRINCIPLES OF ENVIRONMENTAL SCIENCE

Campus
Footscray Park

Prerequisite(s)
Nil.

Content

Required Reading

Class Contact
Four hours per week, consisting of lectures and practicals for one semester.

Assessment
Assignment and practical, 30%; examination, 70%.
SCS512 PRINCIPLES OF ENVIRONMENTAL MANAGEMENT

Campus Footscray Park
Prerequisite(s) Nil.
Class Contact Four hours per week, consisting of lectures and practicals for one semester.
Assessment Assignment and practical, 30%; examination, 70%.

SCS512I ENVIRONMENTAL LAW AND STANDARDS 1

Campus Footscray Park
Prerequisite(s) Nil.
Class Contact Two hours of lecture per week for one semester.
Assessment Assignment, 30%; examination, 70%.

SCS512I ENVIRONMENTAL LAW AND STANDARDS 2

Campus Footscray Park
Prerequisite(s) Nil.
Class Contact Two hours each week for one semester.
Assessment Assignment, 40%; examination, 60%.

SCS5141 AIR QUALITY MANAGEMENT

Campus Footscray Park
Prerequisite(s) Nil.
Required Reading To be advised by lecturer.
Class Contact Four hours each week for one semester.
Assessment Assignments, 40%; examination, 60%.

SCS5152 LIQUID WASTE MANAGEMENT

Campus Footscray Park
Prerequisite(s) Nil.
Class Contact Four hours per week for one semester.
Assessment Assignments, 40%; examination, 60%.

SCS5161 OCCUPATIONAL AND PUBLIC HEALTH

Campus Footscray Park
Prerequisite(s) Nil.
Content Nature of hazards; basic risk assessment; prevention, protection, detection and decontamination of toxic chemicals; radioactivity; indoor air quality; principles of occupational health and safety; emergency incidents; case studies.
Class Contact Four hours per week for one semester.
Assessment Assignments, 40%; examination, 60%.

SCS5172 SOLID WASTE MANAGEMENT

Campus Footscray Park
Prerequisite(s) Nil.
Content Nature and sources of solid wastes; hazardous waste handling: incineration; landfills; other disposal alternatives; monitoring and control.
Required Reading To be advised by lecturer.
Class Contact Four hours per week for one semester.
Assessment Assignments, 40%; examination, 60%.

SCS5181 WATER POLLUTION MONITORING

Campus Footscray Park
Prerequisite(s) Nil.
Content Bodies of water such as the ocean, coastal regions, lakes, rivers and streams, reservoirs and ground water. Objectives of water quality monitoring. Water quality criteria. Methods of water quality surveillance and monitoring. Sampling. Chemical, physical and biological parameters. Aquatic biota and their role in water systems. Statistical design of water quality monitoring programs. The impact of anthropogenic activities, metal, petrochemicals, fertilizers, pesticides and herbicides. Algal


**Class Contact** Four hours per week, consisting of lectures and site visits for one semester.

**Assessment** Assignments, 40%; examination, 60%.

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**SCS652 CLEAN PRODUCTION TECHNOLOGY AND WASTE MINIMISATION**

**Campus** Footscray Park

**Prerequisite(s)** Nil.


**Required Reading** To be advised by lecturer.

**Class Contact** Four hours per week, consisting of lectures and site visits for one semester.

**Assessment** Assignment and site visit reports, 40%; examination, 60%.

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**SCS6510 PROJECT (FULL-TIME)**

**SCS6520 PROJECT (PART-TIME)**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** This subject, which will enable students to competently research an area of study utilising knowledge and skills gained in the coursework component of the SMEM degree program, consists of a research project carried out on an individual basis. The project is expected to be a scientific investigation of an approved topic, followed by the submission of a suitably formatted research project in which the topic is introduced and formulated; the scientific investigation described in detail; results and conclusions from the study elaborated; and an extended discussion presented. Normally the length of the report shall be in the range of 12,000 to 20,000 words.

**Required Reading** To be advised by lecturer.


**Class Contact** Three hours per week for one semester comprising lectures, tutorials and laboratory work.

**Assessment** End of semester three hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will only be available if requested by the School governing the course in which the student is enrolled.

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**SLS8000 RESEARCH THESIS (FULL TIME)**

**Campus** St Albans, Werribee, Footscray Park

**Prerequisite(s)** Eligibility for entry to a Master of Science or Doctor of Philosophy

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**SLS8010 RESEARCH THESIS (PART TIME)**

**Campus** St Albans, Werribee, Footscray Park

**Prerequisite(s)** Eligibility for entry to a Master of Science or Doctor of Philosophy

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**SPH5111 FIBRE OPTIC TECHNOLOGY**

**Campus** Footscray Park

**Prerequisite(s)** Nil.

**Content** This subject provides a first course in the practical and theoretical aspects of optical fibre systems and devices for electrical engineering students. This subject gives students an understanding of the fundamentals of optical fibre communications and sensor technology, and an appreciation of the practical aspects of optical fibre communications and sensing systems. Topics covered: Review of basic optical theory. Types of optical fibres. Attenuation in silica optical fibres. Modes in slab waveguides. Modes, dispersion and distortion in optical fibres. Sources and detectors for fibre optic systems. Noise in detector systems. Fibre optic communications systems. Fibre optic sensors. Optical fibre fabrication. Practical program - Several small demonstrations to give students practical experience in handling fibres and fibre equipment.


**Class Contact** Three hours per week for one semester comprising lectures, tutorials and laboratory work.

**Assessment** End of semester three hour examination plus assignments as advised by lecturer (up to 20%). Supplementary assessment will only be available if requested by the School governing the course in which the student is enrolled.
Recognition of Learning—Pathways, Credit Transfer and RPL

Victoria University recognises that valuable learning takes place outside the university through:
- study towards formally recognised qualifications (either fully or partially completed) such as a degree, diploma, or certificate (this is referred to as credentialled study);
- short courses, offered by professional bodies, voluntary associations, workplaces, trade unions, government agencies and/or community groups, that do not lead to formal qualifications (or non-credentialled learning);
- work experience; and
- life experience.

Students are encouraged to think broadly about their experiences. In addition to providing entry into a course, students’ prior learning may enable them to be granted exemptions/credits for subjects within that course.

Victoria University of Technology has established the following processes (see diagram below) to facilitate the recognition of learning achieved outside the University.

By recognising students’ past experiences and achievements, the University ensures that students do not have to repeat the skills and knowledge they have already achieved.

In this way students are able to shorten the length of their course, saving time and money. They study at the appropriate level, are encouraged to continue their education, and achieve their educational goals with maximum efficiency.

Pathways

Standardised pathways are formally approved links between courses in different sectors or within the same sector. They may move from:
- secondary schools to TAFE
- TAFE to TAFE
- TAFE to higher education
- higher education to TAFE
- higher education to higher education
- workplace to TAFE or higher education
- private training organisation to TAFE or higher education.

These pathways may involve:
- Credit/exemptions – for example students who have completed the Advanced Diploma of Business (Accounting) will receive credit for twelve subjects in the Bachelor of Business (Accounting), if they gain entry into that degree course;
- Entry only – for example students who have successfully completed Science for Nurses (Gateway to Nursing and the Health Sciences) automatically gain entry into the Certificate IV in Health (Nursing).

Pathways may also link courses in the same or different disciplines.

Students who meet the conditions specified in the pathway will be automatically granted the benefits specified in the pathways (entry or credit).
Students who have not completed their initial course may still obtain credit in recognition of the subjects/modules successfully completed. ‘Articulation’ describe the links or pathways between courses. Students who take advantage of pathways are sometimes called articulating students.

Victoria University is widely recognised as a national leader in developing credit transfer arrangements for students, particularly between the TAFE and higher education sectors.

Applications
Students should provide details of any prior study when they:
• apply to enter a course;
• are interviewed in the Centre for Commencing Students; or
• enrol.

Students eligible for entry or credit on the basis of a formally approved pathway will be identified at the time of enrolment. Any credit may be granted at the time of enrolment.

Credit Transfer
Where there are no formally approved pathways, applications for credit on the basis of prior credentialled study will be considered on a case by case basis.

Applications
Students applying for Credit Transfer should approach their Faculty or Department Office for further information and an application form. Forms are also available from the Centre for Commencing Students and Student Administration. It is advisable for students to discuss their applications with their teacher/lecturer before it is submitted.

The University will endeavour to process RPL applications as soon as possible. Processing time depends on the complexity of the application but should take no more than four weeks.

Fees
TAFE applicants will be notified of any fees when they collect their application form. In higher education there are no RPL application or assessment fees.

Notification
Applicants will receive in writing the results of their application for credit on the basis of a formal pathway, an individual credit transfer application, or RPL assessment.

Right of Appeal
Applicants who are either denied credit or who wish to challenge the amount of credit granted on the basis of a formal pathway, a credit transfer application, or RPL assessment may request further consideration. Such appeals must be lodged with the Faculty Office or the Department of Student Affairs within 10 working days of the date the notification letter was issued.

Selection Criteria for Articulating Students - Faculty of Engineering and Science

The Faculty of Engineering and Science at Victoria University is supportive of the provision of articulation pathways for students entering one of the faculty’s Bachelor award programs from a TAFE background.

When selecting articulating students, the Faculty of Engineering and Science takes into consideration the following criteria:
(i) merit;
(ii) relevant post-secondary qualifications:
• some courses require a completed TAFE Associate Diploma or Diploma;
• all departments require the completion of a relevant TAFE course;
• students are required to supply appropriate documentation;
• passes in all subjects relevant to exemptions are required;
• adequate performance (generally 65 per cent average or equivalent);
(iii) work experience relevant to the field of study;
(iv) regionality; and
(v) gender.

How to Apply for Courses
Prospective articulating students already enrolled at Victoria University who wish to apply for all undergraduate courses offered by the Faculty of Engineering and Science will need to complete a ‘Course Transfer Application’ form through the University’s Centre for Commencing Students by October of the year before the course starts.

Prospective articulating students from other post-secondary institutions who wish to apply for all undergraduate courses
offered by the Faculty of Engineering and Science will need to complete an application through the Victorian Tertiary Admissions Centre (VTAC) by September of the year before the course starts.

Prospective articulating students for TAFE courses need to submit an application directly to the TAFE Division of the University.
Admission, Enrolment and Academic Procedures and Regulations

Admission and Selection

The University is committed to achieving access, equity and excellence in tertiary education. Accordingly the University has adopted flexible admission and selection policies that take account of the wide range of educational backgrounds and experience of prospective students.

General

The primary objective of the University’s admission and selection policies is to ensure that students selected for admission to courses are capable of successfully completing the course in which they are to be offered a place. In considering students for admission there shall be no discrimination on the grounds of gender, sexual preference, marital status, pregnancy, race, political beliefs, religion, physical attributes, socio-economic status, language or age.

The University has, however, developed targeted programs designed to ensure a broader representation of students from currently under-represented groups in tertiary education (e.g. women, Aborigines and Torres Strait Islanders).

Admission to the University is conducted within a framework of minimum entry requirements coupled with selection criteria that relate to the demands that each course will place upon students. In addition, the University has a policy of giving special consideration to applicants who live in the western metropolitan region of Melbourne for courses that are not unique to the University.

The selection criteria for each course are reviewed each year and are finally determined annually by the Council of the University on the recommendation of the Academic Board or the Board of Technical and Further Education as appropriate. The selection criteria for each course, including specific prerequisites for admission, are included with the detailed descriptions of each course which appear in the relevant Faculty and TAFE Handbooks. Generally, selection is based on academic merit and by the selection authority’s assessment of the relative likelihood of applicants to successfully complete the course to which they have applied for admission. The main criterion for selection to Degree and Diploma courses is the applicant’s performance in Year 12 studies unless other factors are relevant.

Such other factors may include:
- the results of any interviews, auditions, tests or other assessment procedures determined by the particular course selection authorities;
- any illness, or serious hardship as a result of which, in the opinion of the selection authorities, the studies or performance of an applicant have been adversely affected;
- the presentation and depth of relevant supporting material as determined by the particular course selection authorities;
- the life experiences of the applicant; and
- previous study at tertiary level.

Intending applicants for places in University courses can obtain more detailed information about selection criteria and selection procedures for individual courses by contacting the relevant Faculty, School or Department, or the Centre for Commencing Students.

Personalised Access at Victoria University

The University personalises the application, admission and selection process for places in Government-funded courses in TAFE or Higher Education for all Australian residents who:
- have satisfactorily completed the VCE or its equivalent; or
- are 21 years or over on 1 January of the year for which they seek admission (or for entry to TAFE courses only, anyone over 18).

The University offers applicants a place in the course that best matches their wishes and study potential assessed by the University with the courses and places available. There is high demand for many courses, for which selection remains competitive.

Student Compact

When entering the University through Personalised Access, prospective students participate in an interview with an Academic Field of Study Adviser, at which time their career and study goals are discussed. If entry to the chosen course is not possible, an appropriate study pathway will be identified. This will lead students to their preferred course of study, provided all negotiated conditions as identified in the Student Compact are met. The Student Compact is a documented agreement between the student and the University that lists all negotiated conditions related to their chosen field of study.

The Student Compact will also identify the support services that the University can provide which has been recommended to the student during their interview. The Student Compact is available to all students of the University, and can be renegotiated at any time by the student or the University, to reflect the changing requirements of the student.

For further information about the Student Compact contact the Centre for Commencing Students telephone: (03) 9688 4110.
Admission Requirements

Undergraduate Courses

Normal Entry

Any person who has been granted the Victorian Certificate of Education or satisfactorily completed an equivalent Year 12 qualification recognised by the University (plus relevant course prerequisite studies) will be eligible to apply for admission to courses of the University leading to a higher education award or to a TAFE Diploma.

In general, therefore, applicants will be eligible for admission to higher education undergraduate and TAFE Diploma courses if they have:

• passed the VCE including the satisfactory completion of English Units 3 and 4 from 1992 onwards;
• passed four approved VCE (HSC) Group 1 subjects (including English) at one sitting prior to 1992;
• passed four approved Victorian Institute of Education, HSC, Group 1 subjects (including English) at one sitting since 1980;
• satisfied Victorian University Schools Examination Board or Victorian Institute of Education Year 12 requirements prior to 1986; or
• obtained an equivalent interstate or overseas qualification.

Entry requirements for admission to TAFE courses other than courses leading to a Diploma vary. Details of entry requirements are to be found in the TAFE Handbook.

In addition to meeting the entry requirements above, applicants may be required to satisfy other requirements specified by the Faculty/School conducting the course. Further information can be found on www.vu.edu.au/admissions

Special Entry

Applicants meeting the above requirements will be regarded as having satisfied the Normal Entry requirements. However, applicants wishing to undertake a University course who do not meet the Normal Entry requirements may still be eligible for admission under Special Entry (SE). Students admitted to a course under SE may be subject to special terms and conditions determined by the relevant Faculty or School. The three categories of Special Entry are as follows.

AGE AND EDUCATIONAL BACKGROUND

A person will be eligible for admission to any course within the University if, at 1 January of the intended year of entry, he or she is 21 years of age or over.

Any person who, at the date of their proposed admission to a TAFE course (other than a course for Diploma), is 18 years or older, will be eligible to apply for admission to any such course. Australian residents who meet these criteria are guaranteed a place in a Government-funded course if they apply via the University’s Personalised Access Study scheme.

There is currently a high demand for many award courses, and a number of mature-age applicants do not receive an offer of a place in the course of their choice. Other factors taken into account in selection, in addition to work and life experience, include education level achieved, evidence of aptitude for study, time elapsed since study was attempted, and whether the applicant resides in the western metropolitan region of Melbourne.

Mature-age applicants should be aware of the study difficulties they might face in a tertiary course. The University conducts a number of programs generally of short duration, aimed to help improve communication skills, study skills and confidence. Mature-age applicants may not need to do a preparatory program, but should consider the following:

• It is assumed that students of award courses know how to study. Study involves many skills – taking notes, using a library, organising your time effectively, essay writing, and so on.
• If it has been a long time since you last attended classes, or if your previous study experience was not very successful or enjoyable, it may be helpful to develop some confidence in your abilities before you begin.
• Communication skills are very important for award course students, and this can mean speaking (for example, participation in class discussions) as well as writing. Some practice in this area may be beneficial.
• The real work of any award course usually begins straight away; sometimes on the very first day. You may need some time to ease yourself into being a student.

By undertaking preparation for study, you can pay attention to the factors outlined above in an environment that is designed to minimise the pressure on you. If you move straight into a tertiary course, you might find that you are in fact trying to prepare yourself at the same time as trying to cope with the new material presented to you. This can result in failure to meet the required academic standard.

Courses conducted by the University to help you successfully return to study in an award course may include:

• **Access courses for women**
• **English for Further Study** – This course provides people of non-English-speaking background with the language and research/study skills necessary for study.
• **English as a Second Language (ESL)** - English as a second language classes are tailored to the needs of migrants who wish to improve their English for personal development, further study, or to improve their job prospects. Wherever possible, classes are tailored to suit the needs of the participants.
• **Basic Education Program** – The Basic Education program focuses on the development of students’ communication skills, through writing and reading exercises, spelling, basic grammar and punctuation.
• **Preparation for Tertiary Study** – A preparatory course with two streams designed to improve access to Arts or Science courses.
• **Gateway to Nursing** – A preparatory course that provides access to nursing courses.
• **VCE** – The Victorian Certificate of Education is available by full-time and part-time study.

For more information, contact Further Education and Employment Services on (03) 9284 7225.

CONTINUING DIFFICULTIES DURING SCHOOLING

A person will be eligible to apply for admission to any course within the University if his or her progress through secondary school was adversely affected by:

• economic hardship;
• illness;
• English language learning difficulties;
• family problems;
• geographical isolation; or
• disability.

This category does not apply to applicants whose difficulties occurred only during their last year of secondary studies. Such persons must use the Victorian Tertiary Admission Centre ‘Form S’ rather than applying directly to the University for Special Entry. Applicants wishing to apply on this basis should contact the relevant Faculty or the Centre for Commencing Students for further information.
It should also be noted that this category does not apply to all persons with a disability or chronic medical condition. It only applies to those who can demonstrate that their progress through school was adversely affected by a disability. Persons with a disability should approach the relevant Faculty, School or Department of the University to discuss any potential difficulties or hazards they may encounter in undertaking their proposed course. In these discussions any special needs of applicants can be considered and an indication given of the University’s capacity to meet those special needs. Applicants with a disability or chronic medical condition are invited to discuss specific needs or queries with the Disability Liaison Unit. Phone (03) 9688 4598.

ABORIGINES AND TORRES STRAIT ISLANDERS

A person of Aboriginal or Torres Strait Islander descent is eligible to apply for admission to any course within the University and such applications will be assessed individually to determine the applicant’s suitability and potential for academic success. Further advice may be obtained by contacting the Koori Support and Development Unit on 9365 2113.

Later Year Entry

Both Normal Entry and Special Entry relate to admission to the University at the commencement of an undergraduate course. Persons who have already completed one or more years’ relevant post-secondary studies may be eligible for Later Year Entry to the second or subsequent years of a course.

Persons applying for Later Year Entry will be required to meet all normal selection criteria for the course as well as demonstrate that their prior studies are relevant to the course for which they have applied. In making selection decisions, applicants’ level of performance in all of their previous tertiary enrolments may be taken into account. Persons selected for Later Year Entry may be admitted on condition they undertake bridging course work, or complete a specially modified course plan, or both.

Deferred Entry (Commencing Students)

Prospective students should contact the relevant Faculty or School to clarify the deferment policy. A person to whom an offer of admission to a course has been made by the University may apply to defer his or her enrolment for a period of up to one year. An application for deferred entry must be made in writing and lodged within seven days of the date upon which the offer of admission was sent. The application must be forwarded to the Dean of the appropriate Faculty or the Head of the appropriate School. A Dean or Head may grant an application for deferred entry with or without conditions. Applications for deferment from a TAFE course are not normally granted.

A person who has been granted deferred entry has a right to enrol in their course for the semester following the end of the period of their approved deferment, providing they attend a scheduled enrolment session.

Postgraduate Courses

Normal Entry (PhD)

DOCTOR OF PHILOSOPHY

To be eligible for admission a person must have:

• a masters degree; or
• a four-year bachelor degree with honours or honours degree with a superior performance at 1st Class or 2A honours level; or

• a three-year bachelor degree together with a postgraduate diploma that is an extension of the discipline contained in the undergraduate qualification and at a level considered to be equivalent to 1st Class or 2A honours, as determined by the Head; or

• been enrolled in a masters by research program and shown exceptional ability in the conduct of the first stages in a project and been approved for transfer into a PhD program by the Committee for Postgraduate Studies on the recommendation of the Head.

For admission to a PhD program a student must provide evidence acceptable to the Head of a capacity to undertake research in the discipline.

MASTERS DEGREE

To be eligible for admission applicants must have:

• qualified for a first degree of the University (or such other degree as the Department may deem equivalent for this purpose) at a standard considered by the Department to be sufficiently meritorious; or

• qualified for any other award judged by the Department to be of a relevant and appropriate standard; and

• produced evidence of professional experience through which they have developed their applied knowledge of the relevant field of study, and which satisfies the Department that they have the capacity to undertake study for the degree of master; and

• fulfilled any other conditions relating to prerequisite study which the Department may have imposed in respect of their admission to candidature.

GRADUATE DIPLOMAS/GRADUATE CERTIFICATES

To be eligible for admission applicants must normally have successfully completed a degree or diploma and may be required to attend an interview/selection test.

Application for Admission

Centre for Commencing Students

The Centre for Commencing Students (CCS) provides a central location for TAFE and undergraduate course information. Information sessions are conducted in the evenings and on weekends for prospective students which provide information and advice about return to study or career options, application procedures, and an overview of the University environment.

A resource room is provided where prospective students may browse through brochures of the many courses offered by the University. Advisers are always available to assist with enquiries, provide course information, and offer advice to individuals, schools and community groups. Group sessions can be arranged for local and community groups by contacting the Community Partnerships Officer at the Centre.

The Centre is located at Footscray Park Campus in Building C on ground level (level 3) facing Ballarat Road (adjacent to the pedestrian crossing). Contact the Centre for Commencing Students on telephone: (03) 9688 4110, fax: (03) 9688 4813 or email: ccs@vu.edu.au

Student Administration

The Recruitment and Student Success Branch and Enrolment Management Branch both seek to provide an integrated and professional service to students, staff, past students and prospective students of the University.

The Branches maintain constant telephone and over-counter contact with students by way of answering enquiries, advising on University
requirements, issuing course information and providing services related to enrolment, certification and graduation.

A range of services is provided to staff of the University, including collation and cross checking of results, scheduling and invigilation of examinations and provision of student data and records services.

Staff within these branches work to facilitate the interaction of staff and students in accordance with Higher Education and TAFE administrative requirements, and to provide efficient services to organisational units of the University.

The student administrative services provided by Recruitment and Student Success include:

The Centre for Graduating Students and Education Abroad provides the administrative services for all University course awards, certificates and statements, all onshore and offshore graduation ceremonies and student administration services for all offshore campuses in both sectors.

Enrolment Management provides services in the following areas:
- Admissions and Orientation provides a comprehensive service to prospective students including distribution of course information, collection and processing of applications; and to the University in the coordination of the admissions process, procedures and information.
- Client Services and Information offers assistance with student administration enquiries including enrolment and fees information, cashier functions and switchboard services.
- Enrolment services entail the registration and administration of enrolment amendment for students on all onshore campuses and in both sectors, as well as Higher Education Contribution Scheme administration and TAFE fees.

Undergraduate Courses

Normal Entry

Persons applying for entry to higher education undergraduate courses (other than those listed below under Direct Application) to study either full-time or part-time must apply through the Victorian Tertiary Admissions Centre.

While the VTAC Guide and application form are available from newsagents, a convenient and comprehensive application service is available from their website at www.vtac.edu.au.

Persons applying through VTAC should note that the VTAC rules, by which the University is bound, provide that no selection authority shall take into account the preference for that course as indicated by the applicant. This means that even if an applicant has indicated a lower preference for the course concerned than other applicants, there shall be no prejudice and each applicant will be considered equally.

Prerequisites and Extra Requirements

Some higher education undergraduate courses have special prerequisites for enrolment. Where this is the case, these requirements are published two years in advance in the Victorian Tertiary Education Requirements (this is published as a supplement in the press) and for the following year in the VTAC Guide to Undergraduate and TAFE Courses (available from newsagents and the web: www.vtac.edu.au).

For some higher education undergraduate courses, the application process requires applicants to complete a Supplementary Information Form available from the relevant Faculty Office, the Admissions Office or the University website: www.vu.edu.au. These courses are identified in the VTAC Guide.

Special Entry

Persons applying for admission to a University course under Special Entry (except those applying for readmission) shall obtain an application form from the Centre for Commencing Students. However, persons seeking Special Entry must also apply to VTAC unless the course comes under the Direct Applications category.

Readmission to the University

Students who are currently enrolled in an award course may apply directly to the University for admission to another course for the following semester. Students seeking readmission to the University should contact the Faculty or School administering the relevant course or Student Administration.

All other students who were previously enrolled at the University but whose enrolment has lapsed, or who have been excluded from their course because of unsatisfactory progress, may reapply for admission to the same or another course in any subsequent academic year. These students should apply using the standard procedures for that course. Such applicants for readmission to the University will have to meet the selection criteria applying to their intended course.

The selection process will take account of:
- the person's previous academic performance at the University and their commitment to complete the course; and
- whether the circumstances which led to the person's previous unsatisfactory progress or to their allowing their previous enrolment to lapse have changed or improved.

If selected for readmission such students will be subject to the course requirements in effect at the time of re-entry and may have special conditions attached to their re-admission.

Part-time Admission

Persons applying for admission on a part-time basis to Higher Education undergraduate courses and TAFE courses should follow the application procedures set out above. Where a form is to be lodged with the University as well as with VTAC, applicants should indicate their intention to study part-time on the form.

Postgraduate Courses

MASTERS BY COURSEWORK, GRADUATE CERTIFICATES AND GRADUATE DIPLOMAS

All persons seeking admission to postgraduate studies in the University (except for the Graduate Diploma of Education) must apply direct to the University.

Application forms for graduate certificates, graduate diplomas and masters by coursework are available from the Student Administration Admissions Office at the St Albans Campus or Faculty offices on the campus where the course is offered.

DOCTOR OF BUSINESS ADMINISTRATION

Prospective students should contact the Faculty of Business and Law office at either the Footscray or City campuses for application details.

DOCTOR OF PHILOSOPHY AND MASTERS DEGREES BY RESEARCH

Those persons interested in pursuing a research degree are advised to contact the Postgraduate Studies Officer in the Faculty or Department in which they wish to study to discuss research interests and to determine the availability of suitable supervisors and facilities relevant to the proposed research.

Once the Department has confirmed that the applicant is eligible to enrol, an Application for Enrolment Form must be completed and lodged along with the necessary enrolment forms at Student Administration.
Direct Applications
All direct applications for admission to award courses must be on appropriate University application forms, available from the University. Telephone (03) 9365 2286 for details or via www.vu.edu.au/admissions.

Closing Dates for Applications
Applicants lodging direct applications should contact the relevant Faculty or School for closing dates. Direct applicants should note that the selection process will be facilitated by lodging application forms at the earliest possible date, with the required accompanying documentation attached.

Applicants who wish to study TAFE courses part-time must apply direct to the University using an application form available from the Admissions Office.

Selection Procedures
Applicants may be required to complete a literacy and/or numeracy exercise as part of the selection procedure and may be given the opportunity to attend an interview as part of the selection procedure.

Documentation
Direct applicants currently attempting Year 11 or Year 12 subjects should lodge their applications by the due date and then send a copy of their results when they become available. Other applicants who have attempted Year 11/12 should attach a certified copy of certificates.

All persons seeking admission to a course leading to one of the above awards who did not complete VCE in 2000 must support their application with documentary evidence proving they have the educational qualifications referred to in their application. All documents should be in the form of certified copies and if documents are in a language other than English, officially certified translations together with certified copies of original documents are required. The University will retain all such evidence. Original documents should never be sent but must be available on request and may be required at a later stage of the selection process (e.g., during interview).

If a direct applicant has undertaken previous tertiary studies the applicant must attach a certified copy of the full transcript of his or her academic record(s) obtained at the previous institution(s). Please do not send original documents.

Subject Credits and Advanced Standing

CREDIT FOR PREVIOUS TERTIARY STUDIES
Students who have completed subjects or units at another tertiary institution may be granted credit for equivalent subjects in Victoria University courses. A subject credit will allow a student an exemption from a course subject, while the value of that subject will still be counted towards their award.

Applications for credit for previous tertiary study must be accompanied by certified documentary evidence of the subjects passed, together with details of these subjects for comparison with the Victoria University course. Please note that the University may seek information from the other tertiary institutions about the applicant.

PARTIAL EXEMPTIONS
In some cases where a student is ineligible for full credit from a particular subject, partial exemption may be granted whereby the student is allowed to undertake less than the full normal study or assessment requirements to be accredited with a pass.

Where partial credit has been approved, this will be taken into account in calculating the HECS liability which the student incurs for the subject.

COURSE VARIATION BY SPECIAL APPROVAL
In cases where credit for units/subjects of a student's course is not appropriate, the Dean of the Faculty or Head of the School or Department responsible for the student's course may grant a variation to course requirements by special approval. A course variation substitutes alternative subjects of similar content and duration for subjects normally required within a student's course.

The purpose of Course Variation by Special Approval is to avoid repeating curriculum material where it is deemed that a student will not gain substantial educational benefit from one or more of the normal requirements of the course, but where the student does not meet all the criteria for subject exemption.

Application Procedure
Applicants for admission to courses at Victoria University should indicate on their application form if they wish to apply for credit. Applicants applying for credits are also encouraged to complete an Application for Credit Transfer Form. All such applications must be lodged before the end of the second week of the relevant semester.

Processing of applications for subject credit may take several weeks. This process will be facilitated by the applicant providing all relevant information when lodging an application.

The following documents must be included in an application:
- a completed Application for Credit Transfer Form. This form is available from Student Administration or the relevant Faculty;
- a copy of the applicant's academic record from the previous institution(s);
- where available, a description of the subjects as published in the Handbook of the applicant's previous institution, e.g., if applying for an exemption in Economics 1 at Victoria University on the basis of a pass in Economics 1 at Monash University in 1998, the applicant should attach a copy of the subject description of the unit from the 1998 Monash University Handbook; and
- any other material that applicants wish to submit in support of their application.

Time Lapse Between Studies
Normally, credits for studies in a previous course of study will not be considered if studies were undertaken more than 10 years prior to the application. Courses linked to fields in which there is rapid change in technology and/or knowledge may set a maximum time limit of less than ten years. In cases where it can be demonstrated that relevant skills have been maintained and, where appropriate, updated, the above time limit restrictions may be waived by the appropriate Dean or TAFE Deputy Director on the recommendation of the appropriate Head of School or Department.

Enrolment
Enrolment enquiries should be directed to Student.Admin@vu.edu.au or to any Student Administration office on campus.

Enrolment for Assessment
A candidate becomes eligible for assessment in a subject only when enrolled in that subject. Candidates will be considered as having entered for assessment in all subjects for which they have enrolled.
A student will be deemed to have enrolled for assessment in a subject unless such enrolment has been formally withdrawn by the specified date. Application for timely subject withdrawals must be made on the appropriate University form. Total withdrawal from a course of study must be approved by the Faculty, School or Department responsible for administration of the student's course by the specified date.

All defined fee payments must be completed before any enrolment or assessment is validated and/or confirmed by the University. The enrolment of those students who do not complete payment within the required timeframe will be cancelled. Students are notified of an enrolment cancellation by mail. A student will only be reinstated to the course where authorisation from the Faculty or TAFE School's Administration office has been obtained, a reinstatement fee and all outstanding fees have been paid.

When students enrol at the commencement of the academic year, a provisional enrolment for Semester Two is registered. It is important to note that the Faculty or TAFE School administering each course of study has the power to amend, restrict or cancel provisional semester enrolments.

**Returning Students**

Students who have been enrolled for the previous semester should comply with the re-enrolment requirements set down by the relevant Faculty, School or Department. Particular attention should be paid to University re-enrolment schedules.

**Late Enrolment**

Students must enrol in a course of study or for a subject during official enrolment periods. Where students are unable to attend the designated re-enrolment session, they should arrange for a proxy to enrol on their behalf. Students who do not comply with the enrolment and re-enrolment requirements, including the payment of relevant fees, will be required to pay late enrolment charges and where appropriate, reinstatement charges. Enrolment into a course of study or subject after the third week of a semester will only be permitted in exceptional circumstances and only with the approval of the relevant Head of School or Department, or nominee.

TAFE courses have various start week dates throughout the year. Variations should normally still occur within the first three weeks of the program.

**Course Transfer**

A student enrolled for a course of study wishing to transfer to a course of study in another Faculty, School or Department must apply for admission to the intended course of study on the appropriate form. Where this course transfer is approved, the student will be withdrawn from the previous course and enrolled into the new course.

**Lapsed Enrolment**

Past students of the University who are not on approved Leave of Absence (or deenrolment) from the University and who have not enrolled at the University for the previous semester, automatically forfeit their student place at the University and must re-apply for admission according to the procedure set down for new students.

**How to Enrol**

**Proof of Qualifications**

Admission and enrolment are conditional upon proof of stated qualifications. All claims of qualifications that have been obtained outside the University should be supported by appropriate documentary evidence, certified copies of which should accompany the application for admission. These copies will be retained by the University.

**Approval of Course of Study**

All courses of study (i.e. individual student’s subject selection) must be approved by the Faculty, School or Department responsible for administration of the student’s course before enrolment registration will be accepted by the University. Students should take particular note of the administrative arrangements for enrolment.

**Enrolment Registration and Validation**

An enrolment is registered by the University when it is appropriately approved and entered onto the University's database by an authorised officer or by a student of the University in the case of self-enrolment. Registered enrolments are not validated until all requirements relating to verification of qualifications, payment of fees and acceptance of liability under the Higher Education Contribution Scheme are satisfied.

**Enrolment Forms**

Until student self-enrolment is fully implemented all students commencing or continuing studies at Victoria University must complete the relevant official enrolment and statistics form(s). These form(s) must be lodged for processing within two University working days from the date the form(s) is approved and signed by an authorised officer of the relevant School or Department. Failure to comply with this time limit may result in non-acceptance of the enrolment.

In asking for statistical information the University is conscious of the fact that some students are apprehensive about the uses to which the resulting statistics may be put. The University is compelled by law to supply some statistics – for example, it must supply statistics to the Bureau of Statistics. Statistics supplied to outside bodies will be in the form of aggregate figures only; the outside body concerned will be unable to identify any student by name. Only the Australian Taxation Office is supplied with the names, addresses, birth dates and HECS liability of relevant students of the University.

**Confirmation of Enrolment**

Confirmation of course and subject enrolment will be issued to higher education students each semester and to TAFE students, upon enrolment. Students should check their enrolment details carefully and notify Student Administration without delay of any errors or amendments using an Amendment Form.

Amendment forms are available from Student Administration office at any campus. They may be lodged at the Faculty, TAFE School and/or Campus offices. They may be lodged at the Student Administration office at any campus.

**Student Self-enrolment**

The University is implementing a student self-enrolment system whereby students will enrol themselves in their course and subjects via a computer terminal. This self-enrolment system has been developed to determine the subjects into which a student may enrol and takes into account electives, majors, minors, streams and so on. This means that students are enrolled when they have selected their subjects through this method and paid their fees.

**Student Identity Card**

An identity card (ID) with your student number, photograph and signature will be issued to you at the time of your initial enrolment at the University. This card should be carried with you at all times, as you may be asked to produce it at any time.
Your card is required in the following instances:
• admission to examinations;
• re-enrolment;
• library services;
• computer centre services; and
• travel and other concessions.

Your ID number is a unique number and should be quoted on all correspondence with the University. Proof of identity is required prior to the issuing of your ID card. Cards can only be replaced by paying a fee to the Cashier and taking your receipt together with another form of photo identification to Student Administration.

In addition, University ID cards may be used to operate photocopiers and access other services.

**Complementary Enrolment**

**Students of Victoria University**
Special arrangements can be negotiated whereby students studying toward a recognised higher education award may be given specific approval to undertake studies outside their awarding institution to count towards completion of course requirements. Such arrangements are termed ‘Complementary Enrolment’.

The Director Student Affairs or nominee may approve complementary enrolment, on the recommendation of the nominee of the Dean of the relevant faculty. Approval will not be given for more than one-half of a student's course to be undertaken at another institution.

A student of the University who undertakes an approved complementary course is required on completion of the unit to provide Student Administration with a certificate of results from the host institution, whereupon, if appropriate, a ’J’ result will be recorded to signify that the complementary studies have been satisfactorily completed.

Where the host institution administers a Higher Education Contribution Scheme liability in respect of a complementary enrolment that is approved by this University to count towards completion of a course, that part of the student's subject enrolment at this University relating to the complementary studies will be exempt from HECS liability.

**Students of Other Institutions**
Students who have been admitted to higher education award courses at other tertiary institutions will, under certain circumstances, be permitted to undertake studies at the University to count towards completion of those courses. Approval of complementary students is subject to funding, timetabling and class size considerations, and requires the approval of the Head of School or Department responsible for teaching the subject(s) concerned.

Students of other institutions wishing to apply for complementary enrolment should obtain written approval from the Director Student Affairs (or equivalent) at their home institution, verifying their enrolment status, indicating the nature of the studies to be undertaken, and certifying that the studies, if successfully completed, will count towards the award.

Students who have produced documentation required in accordance with the previous paragraph will be exempted from payment of the General Service Fee normally required upon enrolment at the University, on the basis that they have already paid such a fee elsewhere.

Complementary students will normally be required to accept liability under the Higher Education Contribution Scheme in respect of subjects undertaken at this University. However, students should not be required to accept liability more than once in respect of any particular component of enrolment.

**Enrolment Amendment and Course Withdrawal**

**Higher Education Students**
Students wishing to reduce their study load should complete an Application for Enrolment Amendment Form. Students should lodge the form at a Student Administration Office.

Students who withdraw from subjects before the census date do not incur a HECS liability for those subjects. Students who withdraw from subjects after the census date, but before the late withdrawal date, do incur a HECS liability but not an academic penalty for those subjects. Students who withdraw from subjects after the late amendment date incur a HECS and an ‘NZ’ fail for the subject. Generally, students are not permitted to withdraw after the late withdrawal date.

Students wishing to totally withdraw from studies should complete an Application for Course Leave of Absence, Deferment or Withdrawal Form, obtain approval from the Faculty or Department responsible for administration of the course, and lodge the approved form at Student Administration. Withdrawal from subjects or courses will not automatically be permitted after 31 March in Semester 1 and 31 August in Semester 2.

If a student withdraws from enrolment at the University during the year without being granted leave of absence, it will be necessary to re-apply for admission to the course to recommence studies at any later stage. In such circumstances, re-admission is not automatic.

**TAFE Students**
TAFE students wishing to reduce their load or withdraw from studies should complete the appropriate form within four weeks of the course start date.

**A Word of Warning**
Do not leave things to the last minute. You may receive little sympathy if you approach staff during the examination period regarding a problem that has affected your enrolment status or hampered your performance throughout the semester.

If circumstances force you to ‘drop’ a subject, make sure you apply to withdraw from that subject at the earliest possible time and at least before the deadline specified by Student Administration. If you do not complete the assessment for a subject for which you are enrolled you will receive a ‘Fail’ grade in that subject even if you have not attended classes in that subject. You will also incur a HECS liability for the subject.

**Conditional Enrolment**
A student, whether a commencing or a continuing student, may be permitted to enrol subject to special conditions, provisions or requirements.

Conditional enrolment means that special requirements apply for that student in addition to the normal progression regulations of the course, for a specified period of time (whether that time is measured in terms of course stages or in terms of calendar time).

Where the University attaches conditions, and where these have been formally notified to the student, the continued or subsequent enrolment by that student serves to confirm acceptance of the specified conditions. It is customary, though not obligatory, for the
University to ask the student to sign and date a statement that specifies all of the following:
• the period of time, measured either in calendar time or in terms of course stages, for which the special conditions will apply;
• that the normal progression regulations of the course will not apply to the student for the time specified above; and
• full details of the special conditions and provisions that will apply to the student during the time specified.

Conditions applicable to a student's enrolment will normally be formulated at a meeting between the student and an authorised representative of the Faculty or School. A student may, if he or she wishes, take the proposed conditions away from the meeting to consider them further. However, where this occurs the University will not be bound by the proposed conditions unless students or potential students have notified the relevant University officer in writing within three working days of the meeting of their acceptance of the conditions.

Leave of Absence (Continuing Students)
Leave of absence, for periods of up to one year initially, may be granted by the Faculty or School responsible for the administration of a student's award course. A student must submit an Application for Course Leave of Absence, Deferment or Withdrawal Form available from Student Administration or the relevant Faculty, School or Campus offices.

Undergraduate and Postgraduate Courses
A completed Application for Course Leave of Absence, Deferment or Withdrawal Form including a recommendation from the appropriate School or Department should be approved by the Faculty or School prior to the enrolment census date for the semester in which the leave is to commence.

The Faculty or School will advise students in writing regarding the outcome of their application.

Where leave of absence is approved for Higher Education students after the relevant enrolment census date, students will remain liable for HECS contributions in respect of their enrolment in that semester.

Doctor of Philosophy and Masters by Research
Students should approach the Postgraduate Studies Unit, Footscray Park Campus for advice regarding application for leave of absence. Application forms can be obtained from the Unit or any Student Administration office.

Personal Details
Students who change their name, address or emergency contact should do this in writing by completing a Personal Data Amendment Form available from Student Administration.

Students requiring a change of name must produce documentary evidence (e.g. marriage certificate, statutory declaration) in addition to completing a Personal Data Amendment Form.

Fees and Charges
Fee enquiries may be directed to Student.Fees@vu.edu.au or to any Student Administration office on campus.

Students are required to pay all the fees for which they have been assessed including the General Service Fee, Building Levy and TAFE tuition fees or accept HECS liability after lodging an enrolment form or during self-enrolment. Once payment is completed the University will validate the student's enrolment.

Enrolment for any semester is not valid until all relevant payments have been made.

General Service Fee
In addition to tuition costs, students are required to pay student service and amenities fees. These fees are paid to the University to fund a variety of non-academic and general services, activities and facilities of benefit to all students.

In 2002 the General Service Fee (GSF) for students other than full fee paying students will be:
• For enrolment in higher education subjects: $2.44 per 0.01 equivalent full-time student unit.
• For enrolment in technical and further education subjects: $0.338 per student contact hour.
• A building levy of $40 for enrolment at one or more of the University's Australian campuses to a maximum of $40.00 per student.
• A building levy of $20 for students in receipt of a youth allowance at the time of enrolment.

The following specified classes of students enrolled in TAFE courses are granted an exemption from the liability to pay that part of the GSF charge generated by any enrolment over the specified SCHs:
• VCE, students, up to and including 338 SCH
• Traineeship & Apprenticeship Programs, up to and including 242 SCH
• Tuition fee concession students (AUSTUDY), up to and including 375 SCH
• Exemption from Tuition Fees students, up to and including 48 SCH
• Other students enrolled in Technical and Further Education courses, up to and including 720 SCH

For off campus enrolment in either higher education or technical and further education courses: $15 per student

An alumni association membership levy of $11.00 to a maximum of $44.00

PAYMENT OF FEES IS REQUIRED BY THE DATE SPECIFIED ON THE ENROLMENT OFFER

Students who are unable to complete payment of their fees on time should seek an extension of time from student financial aid counsellors.

TAFE tuition fees are levied in accordance with State Government Policy.

Note that the fees quoted for 2002 are subject to Council approval.

Exemptions
In cases of hardship, students can contact Student Services staff at your campus.

Reimbursement of Fees

Higher Education Students
Upon application, refunds (full or partial) will be granted on any of the following grounds:
• a student withdraws from a course of study at the University by the census date;
• a student changes from full-time status to part-time status within a given semester by the census date;
• a student withdraws from study in an approved course for one
semester before the deadline specified for that semester.
Refunds will be processed provided that the relevant enrolment
amendment form or withdrawal form has been received and
authorised by the census date.

Students should apply for a refund of fees on an Application for a
Refund Form where they believe they are entitled to such a refund.
The amount of the refund payable will be determined according to
the date of lodgement of the Enrolment Amendment Form at Student
Administration or other authorised office within the University.
• Before 31 March – full refund
• After 31 March but before 31 August – refund of second
semester GSF paid only
• After 31 August – no refund is payable unless students can show
there are special circumstances in their case.

A sum of $11.00 is retained from refunds of the General Service Fee
and $5.00 from refunds of the building levy.

TAFE Students
TAFE fees will be refunded to students who withdraw from the
course within four weeks of commencement in order to take up a
place at another tertiary institution.

Students who withdraw from a course within four weeks of
commencement of classes for other reasons will be entitled to a
refund, minus the $56.50 minimum TAFE tuition fee.

When withdrawal of subjects takes place within four weeks of course
commencement and results in a lower tuition fee, students will be
entitled to a refund.

Higher Education Contribution
Scheme (HECS)

HECS Liability - To Whom Does It Apply?
A student enrolled in an accredited, non-exempt higher education
course at the census dates of 31 March for Semester 1, 31 August for
Semester 2, and 15 January for Semester 3, will incur a HECS liability.
The liability is determined according to the study load undertaken
expressed as a proportion of the normal full-time load for each
students year of course.

For details of HECS please refer to the booklet HECS—Your Questions
Answered 2000 published by the Department of Education, Training
and Youth Affairs. Copies are distributed at enrolment and are
available from the Student Administration offices on each campus.

Up-Front Payment Option
The HECS legislation allows students to discharge their liability Up-
Front and receive a 25% discount. Students selecting the Up-Front
payment option at enrolment for a given semester must pay their full
current semester HECS liability less 25% within seven days of the
enrolment registration invoice being produced.

HECS Partial Up-front Payments
The Commonwealth Government has introduced a change to HECS
procedures so as to allow students to make partial up-front payments.
Students may make one payment of $500 or more towards their
HECS liability for that semester and a 25% discount will apply to a
partial up-front payment of $500 or more. The discount will work in
the same way as the 25% discount for full up-front payments.

However, when a partial up-front payment is made, the remaining
HECS contribution will be deferred through the taxation system.

Deferred Payment Option
Non-exempt Higher Education students who do not wish to pay
HECS up-front upon enrolment must complete and sign a Payment
Option Form selecting the Deferred Payment method.

Under the Deferred Payment Option students must, at enrolment,
either:
• provide a valid tax file number; or
• not having a tax file number or not having access to their tax file
number, apply to the Australian Taxation Office (ATO) for a Tax
File Number and provide it to the University before the enrolment
census date. Where the number is not made available to the student
by the census date, the ATO will provide a Certificate of
Application, which the University will accept in place of a Tax File
Number.

Guidelines for Up-front Payment
Students who have made up-front payment and who then withdraw
from part or all of their semester subject enrolment before the
relevant census date will normally be entitled to a proportional HECS
refund.

HECS refunds will not generally be paid by the University until the
enrolment confirmation period is ended—that is, before 30 April in
Semester 1 or before 30 September in Semester 2.

Payment Options for New Zealand Citizens
New Zealand citizens who commenced their course of study on or
after 1 January 1996 must pay their HECS contribution up-front
without a discount. New Zealand citizens continuing a course of
study which began before January 1996 must also pay their HECS
contribution up-front without a discount, unless they have been a
resident in Australia for a continuous period of more than two years.

Differential HECS Contributions for
Commencing Students Only
Differential HECS contributions apply to students commencing a
new course of study after 1 January 1997. The HECS liability for each
unit depends on which of three bands the unit is classified.

Communication from the University to
Higher Education Students on HECS
Liability
The University will issue to each higher education student two
documents about their HECS liability each semester, namely:
• An Enrolment Offer showing the student's personal details, the
subjects the student is enrolled for in the current semester, the
Effective Full-Time Student Unit (EFTSU) value for each of these
subjects, the aggregate EFTSU, the HECS liability amount and the
up-front payment amount for the current semester. The form will
be sent or given to Higher Education students before 15 March in
Semester 1 and before 15 August in semester 2 and in early January
for Summer School.
• A Taxation Invoice and Final Statement of HECS Liability, which will
be sent to all Higher Education students early in April (for semester
one) and mid-September (for semester two). This notice will show:
the aggregate EFTSU enrolment as at the Census Date; the
resulting semester HECS liability; the amount of HECS liability
paid for the current semester; the amount of any HECS liability to
be reported to the Australian Taxation Office; and where applicable,
the amount of any refund due from the University.
• Students will have fourteen days from the date of issue of a 'Final Statement of HECS Liability' to lodge a written objection (giving reasons) at Student Administration. The only valid grounds for such an application are that the University has made an error in recording the students subject enrolment, in calculating the HECS liability, or in recording a HECS payment. Such applications for amendment will generally be considered before 1 May in semester one and before 1 October in semester two, and students will be formally advised of the outcome.

Tax File Numbers

Handling of Tax File Numbers by University Staff
Tax File numbers submitted by students or received from the Australian Taxation Office will be kept secure and confidential and no unauthorised person will be permitted access to this information.

Collection of Tax File Number Information by the University
If a student provides a Tax File Number that does not conform to the specifications provided by the Australian Taxation Office, the responsible University Officer has the authority not to accept or process the student's enrolment.

If a student fails to provide a Tax File Number or a Certificate of Application from the Australian Taxation Office by the enrolment census date, then the responsible University Officer has the authority to terminate the student's enrolment.

Postgraduate Education Loans Scheme (PELS)
The Postgraduate Education Loans Scheme is an interest free loan facility for fee-paying Postgraduate students undertaking non-research courses. It is similar to the deferred payment arrangements available under HECS.

Eligibility
You are eligible for a PELS loan if you are:
• Enrolled in a fee-paying postgraduate non-research course and,
• An Australian citizen or holder of a Australian permanent visa (who meets eligibility requirements)

Loan Available
You can borrow up to the limit of your tuition fees being charged for your course each semester. You will begin repaying your loan through the taxation system once your repayment income reaches the minimum threshold for compulsory repayment.

Further Information
The information booklet, PELS Your Questions Answered, published by the Department of Education, Training and Youth Affairs, contains more detailed information about the scheme. Copies are distributed at enrolment and are available from the Student Administration offices on each campus.

Further information is also available on the following website: www.hecs.gov.au/pelems.htm or by calling PELS enquiry line on 1800 020 108

Assessment
All enrolled students are eligible for assessment in each of the subjects in which they are enrolled. In most subjects offered by the University there will be more than one assessment task or component of assessment during a semester.

The components of assessment for each subject will vary but may include attendance, examinations, tests, exercises, practical tasks, essays, assignments, articles, theses or other work.

More precise details of the assessment for each subject will be provided by the School or Department Examination Board for that subject not later than two weeks after commencement of teaching in the subject. These details will include:
• the nature of each component of assessment;
• the approximate length or extent of each of the components;
• the approximate due date for each component;
• the proportion of total marks assigned to each component; and
• the standard deduction of marks for late submission.

The Examination Board for each subject will consist usually of the Head of the relevant School or Department (as Chairperson) and the examiners for the subject. Usually there will only be one examiner for each subject who will be one of the members of staff teaching the subject. The examiner(s) will be appointed by the end of the second week in each semester. The examiners may be assisted in correcting work by assistant markers appointed by the Chairperson of the Examination Board.

The University has adopted rules in relation to assessment and the supervision of assessment. These rules form Part 1 of the Schedule to a Statute of the University (Statute 6.3—Assessment). A copy can be obtained from the Head Legal and Policy Secretariat, telephone (03) 9688 4022. These rules are normally reproduced by Student Affairs and displayed alongside the final examination timetable.

Assessment is available only to students of the University
Students cannot have results for an examination in a subject in which they have not formally enrolled; check carefully your Enrolment Registration and HECS Liability Statements to ensure that your enrolment is correct in every detail.

Examination Timetable
The final examination timetable is posted on University noticeboards and web site www.vu.edu.au approximately four weeks before the examination period begins. It is your responsibility to check this timetable for any clash, and to refer any clash to the appropriate examinations officer in Student Administration on your campus.

You will not be given special consideration if you misread the examination timetable and miss an examination, nor will you be entitled to another examination.

No information about the examination timetable will be given by telephone.

Conduct of Examinations
Enquiries about examinations may be directed to examinations@vu.edu.au or to any Student Administration office on campus.

Examination sessions will normally commence at:
9.00am morning examination sessions
1.30pm afternoon examination sessions
6.00pm evening examination sessions
unless otherwise indicated on the published timetable.

Students will be admitted to the examination room at those times and given fifteen minutes at the commencement of the session for the
purpose of reading the paper. Any variation of this practice will be notified to students in the printed timetable. As a rule, no writing or note-making is permitted in this reading time. A member of the academic or teaching staff will be present at the beginning of each examination in campus-based venues to answer any inquiries about the question paper.

Before entering the examination room, students must ascertain their seat numbers from lists posted on the University noticeboards and web site www.vu.edu.au. Lists are usually posted two days prior to the commencement of examinations. A student who has not been allocated a seat number should report immediately to the Student Administration office before the commencement of the examination session.

No student may enter the examination room more than half an hour after the commencement of the session or leave the examination room until half an hour after the commencement of the session or during the last quarter of an hour of the session.

You may bring into the examination room: pens, ink, pencils, rulers, erasers and mathematical instruments (see below for use of calculators and electronic devices).

You may not bring into the examination room any book, paper or other material that has not been specifically authorised for use at that particular examination: if, during an examination, you are found to be in possession of such material, you will be reported as having breached examination rules and may face disciplinary action.

You are strongly advised not to bring to examinations any unnecessary clothing, papers, books, bags, handbags, wallets, folders, valuables or other personal items. You will not be permitted to bring into the examination room any bag, handbag, folder, pencil case, calculator case, mobile telephone, paper or similar item. You are warned of the possibility of theft. The University accepts no responsibility for loss of or damage to any item left outside of or brought into an examination room.

You must bring your student identity card to each of your examinations.

Further information about the conduct of the examinations is given in the Notice to Students published with the examination timetable and on the University’s web site www.vu.edu.au.

### Academic Misconduct

Students should note that the University regards academic misconduct as a very serious matter. Students found guilty of academic misconduct could be excluded from the University. The period of exclusion will vary depending on the circumstance of individual cases.

The following are some of the actions which have resulted in students being found guilty of academic misconduct:

- taking unauthorised materials into an examination;
- submitting work for assessment knowing it to be the work of another person;
- improperly obtaining prior knowledge of an examination paper and using that knowledge in the examination;
- disobeying any reasonable instruction of a supervisor;
- directly or indirectly assisting other students or accepting assistance from any person other than a supervisor.

Possible penalties if found guilty of academic misconduct are referred to in Statute 2.7 and include:

- forfeiture of the whole or part of any assessment in the subject to which the misconduct relates;
- the imposition of a fine of not more than $500;
- suspension or exclusion from the course in which the student is enrolled.

### Special Consideration

Students may apply for special consideration if their work during a teaching period or examination or other assessment has been gravely affected by illness or other serious cause.

Application must be made no later than three days after the date of submission of the assessment for which special consideration is sought. Applications seeking an extension of time to complete a component of assessment should be made to the relevant School or Department. All other applications should be made to the Executive Officer of the Faculty concerned or the TAFE Executive Officer.

Where students have been prevented by illness or other cause from making application within the three-day period they can make a late application setting out the reasons why the application could not be made earlier.

A successful application for special consideration may result in the student being allowed to undertake supplementary or further assessment.

Students will not be given special consideration for misreading the examination timetable.

### Students with Disabilities - Alternative Arrangements

Students with a disability which puts them at a disadvantage in written examinations, should advise the Faculty or TAFE Executive Officer at least six weeks before the beginning of the examinations or immediately their disability is known to discuss alternative arrangements for examinations.

### Use of Linguistic Dictionaries

Students may apply to use an English language dictionary in an examination during the first two years of enrolment in the University if:

- the student has arrived from a non-English-speaking country within the last five years;
- the student has regularly attended an approved program designed to improve their language skills.

These are general guidelines only and criteria may vary with individual subject assessment requirements. An Application to Use a Dictionary Form is available from Student Administration offices and must be presented together with a dictionary registered with Student Administration.

### Use of Electronic Linguistic Dictionaries

The use of electronic linguistic dictionaries is not permitted.

### Use of Computers and Electronic Calculators

Faculties, Schools and teaching Departments are responsible for determining which materials will be allowable for use in examinations. Students should refer to individual subject guides for details about the use of calculators and electronic devices. Generally, students will be allowed to bring into an examination room only pens, pencils and non-electronic mathematical instruments unless otherwise specified in the subject guide.
Further Assessment

Before the results of assessment for any component of assessment are published, the examiners may administer a further component of assessment to resolve any doubts as to whether a student has reached the required standards, or about the grade to be awarded to the student.

This means it is vital that students ensure they can be easily contacted between the time a component of assessment is completed and results are published.

Notification of Results

The final results for any subject will not be officially notified to students before the completion of assessment in that subject and their formal publication.

No information regarding results will be given by telephone.

A further component of assessment – oral, written or practical – may be administered by the examiners in any subject at short notice and before the publication of results. Students should therefore ensure that they can be easily contacted until the publication of results.

Review and Reports

Students may apply to have an assessment of any work re-marked or to be given a report on their assessed work. These applications may be subject to a fee.

Applications must be made to the Chairperson of the relevant Examination Board within seven days of the day upon which the results of assessment were published or become available for collection.

Students will be notified of the results of any review of their work.

Subject Assessment and Grading

Grades for Year 2001 are as follows.

Division 1 - Grades For Assessed Subjects (including theses)

A: Grades for Honours subjects, theses and subjects taken in Postgraduate courses

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>First Class Honours, 80–100%</td>
</tr>
<tr>
<td>H2A</td>
<td>Second Class Honours, Upper, 70–79%</td>
</tr>
<tr>
<td>H2B</td>
<td>Second Class Honours, Lower, 60–69%</td>
</tr>
<tr>
<td>H3</td>
<td>Third Class Honours, 50–59%</td>
</tr>
<tr>
<td>N</td>
<td>Fail, 0–49%</td>
</tr>
<tr>
<td>S</td>
<td>Ungraded Pass</td>
</tr>
</tbody>
</table>

B: Grades for other subjects

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>High Distinction, 80–100%</td>
</tr>
<tr>
<td>D</td>
<td>Distinction, 70–79%</td>
</tr>
<tr>
<td>C</td>
<td>Credit, 60–69%</td>
</tr>
<tr>
<td>P</td>
<td>Pass, 50–59%</td>
</tr>
<tr>
<td>N1</td>
<td>Fail, 40–49%</td>
</tr>
<tr>
<td>N2</td>
<td>Low Fail, 0–39%</td>
</tr>
<tr>
<td>S</td>
<td>Ungraded Pass*</td>
</tr>
<tr>
<td>U</td>
<td>Ungraded Fail</td>
</tr>
</tbody>
</table>

C: Competency Based Grades (TAFE)

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>Achieved Outstanding Competency</td>
</tr>
<tr>
<td>CP</td>
<td>Achieved Competency – Highest Grade Awarded</td>
</tr>
<tr>
<td>PP</td>
<td>Achieved Competency</td>
</tr>
<tr>
<td>NN</td>
<td>Competency Not Achieved</td>
</tr>
</tbody>
</table>

D: Codes For Incomplete Assessment

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Continuing Subject</td>
</tr>
<tr>
<td>L</td>
<td>Not yet Assessed – Special Cause**</td>
</tr>
<tr>
<td>RO</td>
<td>Result Outstanding</td>
</tr>
</tbody>
</table>

NOTE: *The grade 'Recognition of Prior Learning' also appears as S’ Ungraded Pass.

**An L grade is required to be converted to a final result within one semester and prior to the commencement of the following academic year, otherwise the assessment automatically lapses to a fail - Higher Education subjects only.

E: Additional Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>Satisfactory Completion of Class Hours</td>
</tr>
<tr>
<td>UC</td>
<td>Unsatisfactory Completion of Class Hours</td>
</tr>
<tr>
<td>SE</td>
<td>Subject Exemption</td>
</tr>
<tr>
<td>E1</td>
<td>Exempt Semester 1 (full year subject)</td>
</tr>
<tr>
<td>E2</td>
<td>Exempt Semester 2 (full year subject)</td>
</tr>
<tr>
<td>CE</td>
<td>Joint Course/Complementary Enrolment (Result issued by other Institution)</td>
</tr>
<tr>
<td>WT</td>
<td>Withdrawn – Transferred</td>
</tr>
<tr>
<td>WN</td>
<td>Withdrawn – Failed</td>
</tr>
<tr>
<td>WD</td>
<td>Withdrawn – Without Academic Penalty</td>
</tr>
<tr>
<td>WL</td>
<td>Withdrawn – Late</td>
</tr>
</tbody>
</table>

Division 2 - Grades For Honours Years, Honours Degrees, Degrees with Honours and Degrees of Master, assessed as a whole

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
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<td>H2B</td>
<td>Second Class Honours, Lower</td>
</tr>
<tr>
<td>H3</td>
<td>Third Class Honours</td>
</tr>
<tr>
<td>P</td>
<td>Pass</td>
</tr>
<tr>
<td>N</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Course Assessment and Grading

Special provisions are made on a course-by-course basis for students who encounter difficulties with academic progress. The provisions for Stage Completion and Faculty Passes detailed below should be read in conjunction with the course-specific progress regulations that appear in the Faculty Details of Courses.

Stage Completion

Some courses are formally divided into stages. These are identified in the details of courses.

Following final assessment in all subjects within a course semester, course year or other defined course stage, a student may receive a stage grading as follows:

• stage completed, all subjects passed;
• stage completed by compensation.

Stage completion by compensation will only be granted to a student who, though not passing all individual subjects, has aggregated grades above pass level and at a standard appropriate for progression to the
subsequent course stage. Stage completion by compensation is not a pass in the subject and might not be recognised by all appropriate professional bodies.

Procedures for stage gradings in particular courses are as recommended by academic course departments or faculties and approved by the University.

Faculty Pass (Higher Education Courses Only)

Faculty passes are only available to students who were enrolled in the University in 1991 and who have not since then discontinued their studies (other than by taking approved leave) or changed their course.

A Faculty Pass may be awarded to a student who has passed (at P grade or better), all but one of the units (subjects) required to complete their higher education course and qualify for the relevant award.

The mark in the outstanding subject must not be less than N1.

The student must have gained sufficient marks in the subjects passed within the award to compensate for the shortfall of marks in the failed subject.

The award of a Faculty Pass shall not be interpreted as a pass in the given subject.

A Faculty Pass will not be awarded in respect of a subject that is a prerequisite for another subject.

Students who have passed all but one of the subjects required to gain an award, and who have been issued an N1 grade in the outstanding subject, may apply for a Faculty Pass by writing to the Faculty responsible for administering the course, clearly stating the basis of their entitlement to such a Pass.

The Pass is awarded at the discretion of the Dean of the Faculty administering the course in which the student is enrolled.

Requirements for Granting of Awards

The policies set out below represent the basic rules relating to the granting of a University award. Additional rules or requirements set by the Faculty are included in the Faculty section of this Handbook.

Partially Completed Courses

Where a student enters a University course by transfer from incomplete studies at another institution, that student must complete at least the final full-time year (or equivalent) of the course to qualify for the University award. This applies to all courses that are longer than one year of equivalent full-time study in duration.

This means, for example, that a student entering a three-year course having previously completed over two years of a comparable award at another institution can receive, at a maximum, two years' advanced standing in the Victoria University course.

Completed Courses - Maximum Advanced Standing

A student with a completed award must complete, at a minimum, the equivalent of at least one year's full-time study in order to qualify for any subsequent University qualification at a comparable level.

Maximum Time for the Completion of Awards

To be eligible for the award of a Degree, Diploma, Associate Diploma, Advanced Certificate or Certificate, a student is required to complete all course requirements within the course progression regulations within the University; maximum periods of time, unless such provision is specifically waived for that student by the University. Maximum times for completion of awards are as follows:

- Certificate 5 years
- Advanced Certificate 5 years
- Associate Diploma* 8 years
- Undergraduate Diploma 10 years
- Undergraduate Degree of 3-years duration full-time 10 years
- Undergraduate Degree of 4-years duration full-time 12 years
- Graduate Diploma 6 years
- Graduate Certificate 3 years

*Including time taken to complete preliminary Advanced Certificate year where applicable.

The time periods are taken from the beginning of the first semester for which the student was enrolled in the course, until the completion of all course requirements, and may include time elapsed due to deferment, suspension or voluntary withdrawal from the course.

Note: The maximum completion times apply in the absence of specific course requirements. For specific courses, shorter maximum time periods can be specified, and where this is the case, the shorter time limit will apply.

Academic Progression

Unsatisfactory Progress

The demand for tertiary study places exceeds the number of places available. Every year a considerable number of applicants fail to gain entry to the University. It is assumed that every person selected into an award course has the capacity to succeed. However, if students do not progress satisfactorily, they will be asked to show cause as to why they should be permitted to continue in the course.

An important aim of the University is to assist its students to succeed. Therefore, students should make use of the free counselling services provided if they are encountering problems or difficulties that are affecting their studies. These difficulties could include problems in organising time, financial difficulties, personal problems or difficulties in writing and presenting assignments and essays.

On the recommendation of the relevant Faculty or School, the University may specify academic progression rules for each individual course. Students should carefully read the progression rules relating to their course of study as detailed in the relevant section of the Handbook or in course regulations.

A student who fails to make satisfactory progress in a course of study is liable for exclusion from that course. This applies where a student does not achieve a satisfactory performance on a component of assessment, or does not perform a component of assessment. In these cases, the relevant Faculty, School or Department, after investigating the circumstances and allowing the student to be heard, either personally or through a representative, may notify the student in writing that he or she has made unsatisfactory progress in a subject.

In addition to notifying the student of unsatisfactory progress, the relevant Faculty or School may also notify the student that it intends to make a recommendation to the Academic Board or the Board of TAFE that the student be excluded or suspended from the course or only be allowed to continue under certain specified conditions. As a general policy, the following will form part of all award course progression regulations within the University.

Students may not:
- enrol in any sequential subject without having passed all prerequisite subjects; or
• enrol in any unit with a co-requisite subject without having either
  previously passed the co-requisite subject or enrolling
  simultaneously in the co-requisite subject.

In reaching its decision about what action should be recommended
with respect to unsatisfactory progress by a student, the faculty or
school may establish one or more committees to consider the
circumstances and hear any submission that a student wishes to make.

After receiving a recommendation from a faculty or school, the
Academic Board or the Board of TAFE, as appropriate, may exclude
or suspend the student from a course.

Alternatively, the relevant Board may specify the conditions under
which the student may continue in a course.

Special arrangements will apply to doctoral students and students
undertaking masters degrees by research who should seek advice on
those arrangements from their supervisors.

Any student who is notified of unsatisfactory progress should seek
assistance from Student Services staff or the Student Union at the
earliest opportunity.

Discipline

The University will act to protect good order and the rights of
individuals within its confines. To this end, a formal process will be
followed to deal with any alleged breach of discipline or misconduct.

The University operates within the provisions of a Statute dealing
with discipline (Statute 4.1—Discipline). The full text of this Statute
is printed in the Calendar.

Plagiarism

Paragraph 11(3)(d) of the Schedule to Statute 6.3.1—Assessment
states that a student shall not, during or in connection with the
performance of any component of assessment, submit, or represent
the whole or part of published or unpublished material, written or
prepared by some person or persons other than that student, as being
the work of that student.

Any student committing a breach of this rule shall be guilty of a
disciplinary offence and all further proceedings will be conducted in
accordance with Statute 4.1—Discipline, and Statute 2.7—The
Discipline Committee.

Procedures Relating to the
Graduation of Students from
Award Courses

This information relates to graduation from Certificate, Advanced
Certificate, Associate Diploma, Diploma, Degree, Graduate
Certificate, Graduate Diploma, Masters Degree and Doctoral award
courses of the University.

Upon satisfying all the requirements of an award course a student is
regarded as a graduand and is eligible to become a graduate. When
you have completed or nearly completed a course you are required to
submit an Application for an Award Form. Forms can be collected
from and handed in at the Enrolment Management office at any
campus of Victoria University or downloaded from the University
Website.

Forms must be completed before the set closing date.

Graduation ceremonies in 2002 are scheduled as follows:

20 February 2002  Hong Kong

23 February 2002  Malaysia

26 February 2002  Singapore

Applications close 28 September 2001

22 to 26 April 2002: Application closing date is 21 December 2001.


A graduation fee and guest ticket charge applies if you decide to
attend a graduation ceremony.

Academic Dress

The wearing of academic dress on ceremonial occasions is one of the
traditions that is attached to universities. Victoria University has based
its academic dress on the basic style of Oxford. It consists of a gown,
a cap or bonnet, and a hood which represents the discipline of the
degree.

Division of TAFE Certificants: A black gown and black cap.

Division of TAFE Diplomates: A black gown and black cap with a
black stole faced with the colour tangerine.

Bachelors: A black gown and black cap with a black hood half lined
with the discipline colour as follows:

Ruby  Arts

Ultra marine  Business or Business Administration

Cherry  Education

Silver Grey  Engineering

Old Rose  Health Science

Grape  Music

Buff Psychology

Spectrum Green  Science or Applied Science

Buttercup  Social Work

Higher Education Diplomates and Certificants: A black gown and
black cap together with a black stole faced in the discipline colour.

Masters: A black gown and black cap with a black hood fully lined
with the discipline colour.

Doctorates: A black bonnet with a gold cord and scarlet gown with a
facing of the discipline colour and black hood fully lined in the
discipline colour as follows:

Adonis Blue  Doctor of Business

Cherry  Doctor of Education

Charcoal Grey  Doctor of Engineering

Ruby  Doctor of Letters or Laws

Sapphire  Doctor of Philosophy

Old Gold  Doctor of Psychology

Spectrum Green  Doctor of Science

Sky Blue  Doctor of the University

Credit Points

The credit point system provides a uniform basis for establishing
subject relativities and values within a course. The objectives of the
credit point system are to:

• simplify and standardise the relativities and values within a course
  in relation to EFTSU and Higher Education Contribution Scheme
  (HECS) calculations;

• provide a uniform measure of total student workload across all
  higher education programs; and

• allow students to make informed judgements on their likely
  workload in subjects across various disciplines.
What is a credit point value?
The value of a credit point is determined by the total student effort involved in the completion of a subject and includes private study hours, tutorial or laboratory work, library and research work together with formal class contact hours. The credit point value of a subject reflects its academic weight and the total amount of effort relative to other subjects within a course. There is no link between credit points and contact hours.

What type of credit point system?
The University has introduced a standard course value system of credit points. This means that all courses within the higher education sector of the University will have the same number of credit points for each year of a course.

How many credit points?
The University has adopted a system of 120 credit points for each year of a course. Thus a three-year degree program will equal 360 credit points, a four-year degree 480 credit points and so on.

How can I identify my enrolment load?
0–44 credit points per semester will equal a part-time load
45–60 credit points per semester will equal a full-time load
0–90 credit points per year will equal a part-time load
91–120 credit points per year will equal a full-time load.

EFTSU
All universities are required to calculate individual student enrolment load per year of a course. The Department of Education, Training and Youth Affairs expresses the value of an enrolment load as a percentage of 1, which is considered to be the total value of a standard, full-time course load. This unit of measurement is referred to as an Equivalent Full-Time Student Unit or EFTSU.

For example, a part-time student may record an EFTSU value of 5, indicating that the load for which the student is enrolled carries a value equivalent to half the standard student load for that course.
Services Available to Students

Careers and Employment Service

The Careers and Employment Service provides an innovative range of services to students of Victoria University. These services include:

- Careers Counselling
- Careers Development Programs
- Graduate Employment Services
- Careers Resource Centre

Online Careers Resources – Careers and Employment Service website: www.vu.edu.au/careers/

- Careers Counselling

Careers counselling can help you make informed decisions about study/career paths, preparation for the job market and planning your career. To book an appointment with a Careers Counsellor contact the Careers and Employment Service at Footscray Park Campus on (03) 9688 4418 or St Albans Campus on (03) 9365 2399.

Careers Development Programs

The Careers and Employment Service provides a range of free career preparation workshops throughout the academic year which are designed to assist Victoria University students in their preparation for the job market. Workshops offered include:

- Preparing Professional Written Applications
- Interview Techniques & Preparation
- Creative Job Search Strategies.

Graduate Employment Services

The Careers and Employment Service provides students with access to a wide range of graduate employment opportunities covering a broad range of study areas and occupations. Major graduate employers such as BHP, Ericsson, Lend Lease, ANZ, KPMG, Southcorp, Unilever, Australian Public Service agencies, Mars, Holden and Ford, are just a small sample of the graduate recruiters who promote their graduate programs through the Careers and Employment Service at Victoria University.

Many of these employers begin their recruitment campaigns early in 1st semester. Consequently it is highly recommended that students begin their search for graduate employment at the beginning of their final year.

Graduate employment vacancies and notification of on-campus employer information sessions can be obtained through the Careers Newsletter, the GradJobs email list and via careers noticeboards which are strategically located across the University.

Careers Resource Centre

The Careers Resource Centre holds a variety of useful resources (print and video) to assist students in developing their knowledge about careers and preparation for the graduate job market.

Resources and information are available about:

- Graduate employers
- Occupations
- Professional associations
- International career and study opportunities
- Course directories for TAFE, undergraduate and postgraduate study
- Preparation for the job market (resumes, interviews, job search).

The Careers Resource Centre is located at Student Services, Building M, Level 2, Footscray Park Campus. A large number of resources are also held in Student Services, Building 4, St Albans Campus, with smaller holdings on other Victoria University campuses.

Students can also email enquirers to careers@vu.edu.au (enquiries must include the student's name, course and student ID number).

Online Careers Resources

The Careers and Employment Service web site www.vu.edu.au/careers/ provides students with access to a broad range of online careers resources to assist in career exploration and preparation for the job market. There are over 1100 web links on the Careers and Employment Service web site, including links to:

- 400+ graduate employers
- 65+ professional associations
- 90+ overseas work and study opportunities

There is also an online suite of careers information brochures with a selection of articles to assist students in their career planning and preparation. Examples include:

- Developing Career Skills: An Action Plan For Students
- Why Join a Professional Association?
- Writing a Winning Job Application
- The Graduate Job Interview
- Job Interviews: Tips For Not Freaking Out
- Job Search Strategies for International Students

Final year students are advised to regularly check the Careers Newsletter and subscribe to the GradJobs email list via the Careers and Employment Service web site.

Children’s Services

Victoria University has Children’s Centres located on five campuses – Footscray Nicholson, Footscray Park, Newport, St Albans (Jindi Woraback) and Werribee.

Each Centre provides educational programs that respond to the children's social, emotional, physical, cognitive and creative needs. Nutritious meals and snacks are provided for the children throughout the day. All of the University Children's Centres have been assessed as providing the highest level of care by the National Childcare Accreditation Council.
The Footscray Park, Newport and Werribee campus Children’s Centres and Jindi Woraback provide a funded and integrated preschool program with a qualified Early Childhood (Kindergarten) teacher.

Families using the University’s Children’s Centres are eligible to apply for Child Care Benefit (CCB) through the Family Assistance Office (FAO) – formerly Centrelink. The FAO is responsible for assessing family income and determining the percentage of Child Care Benefit families receive. For further information please contact your local Family Assistance Office.

City Flinders, City King and City South Melbourne Campuses

Telephone: 9688 4418

A Referral Service has been developed for the city campuses to assist families in finding suitable childcare. Telephone the Manager, Children’s Services, on 9688 4418 for further information.

Footscray Nicholson Campus

Telephone: (03) 9284 8698

The Footscray Nicholson Campus Children’s Centre is located on the Ground Floor, Hoadley Building, Albert Street, Footscray. The Centre caters for a maximum of 39 children aged 3 months to 6 years on a full-time (weekly), daily, sessional (half day) and occasional care basis. The Centre is open from 7.45am to 5.45pm, Monday to Friday.

Footscray Park Campus

Telephone: (03) 9688 4418

The Footscray Park Campus Children’s Centre is located at 8 Geelong Road, Footscray. The Centre caters for a maximum of 42 children aged 3 months to 6 years on a full-time (weekly), daily, sessional (half day) and occasional care basis. The Centre is open from 7.45am to 5.45pm, Monday to Friday and offers a funded preschool program incorporated within the educational program.

Jindi Woraback Children’s Centre

(St Albans Campus)

Telephone: 9364 6855

The Jindi Woraback Children’s Centre is located at the Willis Street entrance of the St Albans Campus and is operated by a Management Committee consisting of parents and representatives from the University and the Brimbank City Council. The Centre caters for children aged from birth to 6 years on a full-time (weekly), daily, sessional (half day) and occasional care basis. A funded preschool program and a vacation care program for primary school aged children are also provided. The Centre is open from 7.00am to 6.00pm, Monday to Friday.

Melton Campus

Telephone: (03) 9747 7500

The Brookfield Preschool operates from the Melton Campus Children’s Centre and is located at the Wilson Road entrance of the Campus. The Centre offers sessional kindergarten programs for three- and four-year-old children.

Newport Campus

Telephone: (03) 9284 8476

The Newport Campus Children’s Centre is located in Building K, Champion Road, Newport. The Centre caters for a maximum of 42 children aged 3 months to 6 years on a full-time (weekly), daily, sessional (half day) and occasional care basis. The Centre is open from 7.45am to 5.45pm, Monday to Friday. The Centre provides a fully integrated and funded preschool program.

Sunbury Campus

Telephone: (03) 9688 4418

Currently, there is no childcare provided on the Sunbury Campus. For information regarding childcare centres in the local area, contact the Manager, Children’s Services on 9688 4418.

Werribee Campus

Telephone: (03) 9748 9568 or (03) 92168098

The Werribee Campus Children’s Centre is located in Hoppers Lane (at the entrance of the Campus), Werribee. The Centre caters for a maximum of 45 children aged 3 months to 6 years on a full-time (weekly), daily, sessional (half day) and occasional care basis.

The Centre is open from 7.15am to 6.15pm, Monday to Friday and offers a state-funded preschool program incorporated within the educational program.

Education Abroad

The University has partnerships with several organisations which assist the University in the delivery of a range of courses in off shore teaching sites including Hong Kong, Singapore and Malaysia. This unit provides administration support to the offshore students enrolled in these courses. In addition it has responsibility for developing and implementing student support services programs in the offshore sites.

Graduating Students

The Centre for Graduating Students and Education Abroad is responsible for the administrative provision of all awards and statements for the University. When you have completed or nearly completed a course, you are required to submit an Application for an Award form. Forms can be collected from and handed into the Enrolment Management Office at any campus of Victoria University or downloaded from the University website. The organisation of all conferral ceremonies, both onshore and offshore, is also the responsibility of this unit.

Centre for Graduating Students and Education Abroad

Telephone: 61 3 9365 2846
Fax:61 3 9365 2853
Email: graduate@vu.edu.au
Website: www.vu.edu.au
Located Building 4G, 141, St Albans Campus

Optometry and Dentistry

The Student Union operates optometry and dental services through local agencies. All enquiries should be directed to the Victoria University Student Union Resource Centre Building M, Level 2, Footscray Park Campus. Telephone: 9688 4065.

Health Practice Unit

The Faculty of Human Development operate a Health Practice Unit at the St Albans Campus, providing a range of therapies such as acupuncture, massage and herbal medicines. Cost for students is very modest. Telephone: 9365 2625.
Independent Access: Students with Disabilities

Counselling, support and information for students with access disabilities are available from Student Services on all campuses.

Assistance is available to students with disabilities for day-to-day issues of personal, academic, housing, career and financial matters; identification of support needs; and applications for alternative examination/assessment arrangements and special consideration.

Further information and advice concerning support services for students with a disability can also be obtained by contacting the Disability Liaison Unit at the Equity and Social Justice Branch at Footscray Park Campus on telephone: (03) 9688 4598.

Orientation

Orientation Week (O-Week) is an annual event which is held at the beginning of Semester 1. During this week, a wide range of events are organised by the individual Faculties and Student Union to provide opportunities for students to meet each other and also to gain an awareness of the activities and services provided by the various University departments.

The Student Union distributes an Orientation Handbook. ‘The Survival Guide’ is published annually and includes information about the Student Union, Clubs and Societies, services available to students and a range of extracurricular activities. Further information can be obtained from the Resource Centre or the Student Union office on the City Flinders, City King, Footscray Nicholson, Footscray Park, Melton, Newport, St Albans, Sunbury, Sunshine and Werribee Campuses. (Refer to Student Union section for Campus phone numbers).

Student Services

Student Services provides support to students in a variety of ways. Staff provide academic support, personal and vocational counselling, help with finance, housing and health services.

Student Services offices are located on most campuses and are open Monday to Friday during normal working hours, or after hours by appointment. For further information contact Footscray Nicholson campus on 9284 8801, Footscray Park campus on 9688 4418, St Albans campus on 9365 2399 or visit our webpage: www.vu.edu.au/ss.

Accommodation

The University Student Housing Service provides students with a wide range of free and confidential services to assist with locating, securing and maintaining suitable accommodation. The Student Housing Database, including current accommodation listings, is now on the Internet to improve accessibility. The ‘Housing Web’ can be located at http://www.vu.edu.au/ss/housing/ and holds a current listing of all accommodation offered to the University. The Housing Web also provides a wide range of tenancy rights information and also other information such as Real Estate Agent lists and Student Village information. It provides links to a wide range of appropriate housing related services including Share Accommodation, Public Transport and Emergency Housing Services. Accommodation offers can be placed directly onto the Housing Web.

The Housing Officer is based at Footscray Park Campus and can provide tenancy advice, referral and case management as well as assistance with general housing information. At other campuses, Student Services staff can assist with accommodation inquiries. For further information, contact the Housing Officer on telephone: (03) 9688 4420 or e-mail housing@vu.edu.au.

Chaplaincy

Chaplains are available at the St Albans and Footscray Park campuses. For information or appointments, telephone: 9688 4480 (Footscray) or 9365 2292 (St Albans).

Counselling - Personal

Personal counselling is available at many of the campuses. Counselling can help students optimise their emotional, social and academic well being. Students are invited to discuss any personal, family or relationship matter with one of the counsellors. Some examples of issues discussed include loneliness, difficulty adjusting to life at the University, relationships, sexuality, family difficulties, grief and loss, self-confidence and anxiety. Counselling can be contacted by telephoning 9688 4418 or 9365 2299.

Financial Assistance

Assistance can be provided to students experiencing financial difficulties. As well as helping students to work out ways of budgeting and planning, the financial advisor/counsellor can assist with claims for Youth Allowance/Austudy and fee extensions.

When discussing your needs a counsellor may be able to help you with information about financial assistance. This may include such things as emergency relief, rent assistance and various forms of Centrelink benefits.

Youth Allowance/ Austudy Applications

The Youth Allowance/Austudy/Abstudy schemes provide assistance to Australian citizens and permanent residents who are enrolled in approved courses at universities, TAFE institutes and other approved institutions in Australia. (Generally, Youth Allowance is for persons up to age 24, Austudy, 25 and over). Abstudy is a scheme for Aboriginal and Torres Strait Islander students. The Pensioner Education Supplement (PES) is an additional payment available to students on certain Centrelink payments.

Assistance is subject to a means test and to certain conditions, including a minimum study load. Part time students under 21 years of age should note there is a provision for the payment of Youth Allowance for the sum of other approved activities such as job seeking, volunteer work, or training in addition to part time study. Ask the financial advisor/counsellor or seek a Centrelink interview.

A student who is eligible and qualifies for assistance may receive a living allowance and under special circumstances a fares allowance and rental assistance. Students may also apply for up to $500.00 advance on future instalments, recovered over 6 months; this can only be done once in a calendar year.

Claim forms are available on Campus, at secondary schools and Centrelink offices. Students are advised to lodge their initial claim with the nearest Centrelink office as soon as they enrol or re-enrol. Payees continuing in their current course will not have to submit another claim, but should return the Review Form sent to them within the stipulated time. Note that there is no provision for back pay if a student is not currently receiving benefits. It is important that an application for Austudy/Youth Allowance/Abstudy be lodged as soon as possible.
Loans
Student Services administers a loan scheme for enrolled students of the University who can demonstrate a genuine need. Loans are available for living expenses, bonds and rent, purchase of books, equipment or other circumstances where a student's continued study is in jeopardy.

Application forms and information sheets are available on campus from Student Services on most campuses.

International Student Support
Two International Student Advisers provide services and programs for international students in Higher Education. They are also available to provide individual assistance and support.

TAFE International services are available at the Footscray Nicholson Street Campus, telephone: (03) 9284 8517.

Services for AusAid sponsored students are available through Footscray Park Campus, telephone: (03) 9688 4780

Further information is available at Footscray Park Campus, telephone: (03) 9688 4777, St Albans Campus, telephone: (03) 9365 2399 or City Flinders Campus, telephone: (03) 9249 1159.

Further information relevant to International students is available from the International Branch at City Flinders Campus, telephone: +61 3 9248 1164.

Health Advice and Nursing Service
There are two health advisors (nurses) at the University. Typical issues that people consult the health advisors about include:

- General health and wellbeing
- Lifestyle issues
- Women's health
- Drug use issues
- Men's health
- Nutrition
- Chronic illnesses
- Family planning and sexual health
- Pregnancy testing
- Assistance with injuries and dressings
- Referrals to community agencies
- Vaccinations (at Footscray Park Campus)

The health advisors can also be contacted through Student Services on 9688 4418.

Medical Centre
A Medical Centre is located at Student Services at the Footscray Park Campus in Building M, Level 2. Doctors consult on a sessional basis Monday to Thursday.

All consultations are bulk billed on presentation of a Medicare card. For international students the Medical Centre bills Medibank Private direct. This means international students do not have to pay after their consultation provided they have their current Medibank Private card with them and they fill out a claim form at the Medical Centre. For appointments phone Student Services on 9688 4418 or drop in to Student Services

Drug Education
Substance use and abuse is an issue of considerable concern in the general community. The University has a drug education officer who can provide information on drug related issues and provide advice on how to find treatment and counselling services in the community. Education sessions on these issues can be organised for groups of students by contacting the drug education officer on 9284 8886.

First Aid
There are first aiders on all campuses of the University. Lists of first aiders can be found on the Health Medical and Allied services web page: www.vu.edu.au/ss/health/

First aiders are only to be contacted in more urgent or emergency situations. Examples of the sorts of things you might contact a first aider for include:

- bleeding cuts
- burns
- joint injuries
- suspected fractures
- sudden illness
- collapse

If a situation is life threatening, contact the Ambulance (0) 000 first. Be careful to state your location and the nature of the emergency. If possible have someone meet the paramedics at an easily accessible point.

Health and emergency centres close to each campus are also listed on the Health Medical and Allied services web page.

Pre-Existing Medical Condition
Any person with a pre-existing medical condition, e.g. heart condition, asthma, diabetes, or epilepsy, should make contact with one of the University's health officers (nurses) so that in an emergency the response can be quick and appropriate. The nurse can provide assistance in the management of a person's condition while studying at the University. All information is kept confidential.

Anyone wishing to advise a nurse of their medical condition can contact Student Services at the Footscray Nicholson Campus on 9284 8563, at the Footscray Park Campus on 9688 4417, or by calling Student Services on other campuses.

Student Learning Unit
The Student Learning Unit (SLU) forms part of the Centre for Educational Development and Support (CEDS).

The CEDS SLU provides free English language, Maths, Science and academic skills support for students at Degree level and above.

Support is provided in the ways described in the following paragraphs.

Subject-Linked Classes
Certain subjects seem to present students with particular difficulties in the area of researching, academic reading and writing, oral presentation and/or other academic skills.

CEDS SLU staff conduct support classes linked to these subjects which focus on the academic skills needed for successful
completion of the assessment tasks in that subject. Classes are also offered on a similar basis in some areas of Maths such as Business Statistics, and in certain science subjects.

Further information about these classes is available from subject guides, subject lecturers, the CEDS SLU web site or directly from the SLU main office.

General Classes
CEDS SLU staff also conduct some general classes such as Reading and Writing for Engineering Students, and Summer and Winter Schools which are open to all students.

Individual Appointments
Postgraduate students may make individual or small group appointments to discuss their essay or thesis work. A very limited number of individual or small group appointments is available for undergraduate students who would like assistance with academic skills in some particular subjects where there is no linked CEDS SLU class.

Email Consultations
Students may consult a CEDS SLU lecturer about their work using email. However students should discuss this with the lecturer involved before sending work. Lecturers will comment on work, but not correct it.

Further Information
Contact Kim Borg or Bernadette Trickey CEDS Administrative Officers, on 9688 4744.

Student Organisations
The peak student body for the University is the Victoria University Student Union (VUSU). Under this umbrella there are a number of sections including the International Students Association, the Victoria University Postgraduate Association as well as many clubs and societies.

The VUSU provides a range of services through the Resource Centres and officers on each campus. These services are designed to make students' time at the University smoother and more enjoyable, and include recreation, sports, activities, advice, representation, advocacy and campaign organising.

Further information can be obtained from the Union Diary and the Survival Guide or by contacting the Student Offices at the following campuses:

City Flinders:
Student Union Office: (03) 9248 1221

City King:
Student Union Office: (03) 9284 7831

Footscray Nicholson:
Recreation Office: (03) 9284 8774
Recreation Centre: (03) 9284 8761
Student Union Office: (03) 9284 8534

Footscray Park:

Union Reception/
General Enquiries: (03) 9688 4360
Resource Centre: (03) 9688 4302

Melton:
Recreation Office: (03) 9747 7552
Resource Centre: (03) 9747 7551

Newport:
Resource Centre: (03) 9284 8474

St Albans:
Student Union Office: (03) 9365 2706
Resource Centre: (03) 9365 2638

Sunbury:
Recreation Office: (03) 9218 3334
Resource Centre: (03) 9218 3206

Sunshine:
Student Union Office: (03) 9284 7258

Werribee:
Recreation Office: (03) 9216 8260
Resource Centre: (03) 9216 8206

Alumni Association
Alumni of the University include staff, graduates, current students, and members of the community who have a connection with Victoria University. Membership of the University's Alumni Association enhances the opportunities of members to achieve their professional aspirations. Students, graduates and staff maintain contact with one another and organise reunions, networks and business functions.

Staff of the Alumni office provide support in developing member networks and Alumni Chapters. Chapters focus on a particular discipline and draw together graduates to form a network in a related field. There are currently Chapters in Graphic Arts, MBA, Recreation/Fitness Leadership, Arts and Traditional Chinese Medicine.

Members of the Alumni Association are sent regular information on social activities, professional seminars, mentoring programs, activities within the University and activities organised by the various Alumni Chapters. Members also receive quarterly a copy of the University newspaper Nexus containing the Alumni supplement bulletin, and receive invitations to specifically targeted events organised by the Alumni Chapter in their field of study.

The Association also offers many complimentary member benefits. These include continuing use of the University's library facilities after student members graduate, and discounts to a range of services such as car rental, travel, sporting goods, the University bookshop, newspaper subscriptions and hotel accommodation.

There are also several International Chapters of the Alumni Association for those graduates who return home overseas. To date, Chapters and/or networks have been developed in Hong Kong, India, Malaysia, Singapore, Taiwan and Thailand.

Membership for current students and first-year graduates is $11.00. The Alumni office is at the City Flinders Campus and is situated on the Ground Floor, 301 Flinders Lane, Melbourne. Telephone: +613 9248 1017; Fax: +613 9248 1007; Email: alumni@vu.edu.au
Travel Concessions

Rail and bus concession application forms are available at the start of each academic year from VU Student Union (Resource Centres). Courses at Victoria University in 2002

This section lists all the courses offered by Victoria University in higher education and TAFE.

Note: All courses are offered subject to confirmation of PETE funding and authority to conduct, and minimum enrolment levels. List correct as at October 2001.
Courses at Victoria University in 2002

This section lists all the courses offered by Victoria University in higher education and TAFE.

Note: All courses are offered subject to confirmation of PETE funding and authority to conduct, and minimum enrolment levels. List correct as at October 2001.

Undergraduate Courses and Programs

Campus codes:
- B = Sunbury
- C = City Flinders
- D = China
- E = Echuca
- F = Footscray Park
- H = Hong Kong
- J = City King
- K = Kuala Lumpur
- M = Melton
- O = Off campus
- P = Singapore
- Q = Queen Street
- R = Renmin University of China
- S = St Albans
- T = Internet
- W = Werribee
- 3 = Bangladesh

Faculty of Engineering and Science

<table>
<thead>
<tr>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate in Foundation Studies</td>
<td>F, S</td>
<td>Y, Y</td>
</tr>
<tr>
<td>Bachelor of Engineering/Bachelor of Science</td>
<td>F, S, W</td>
<td>Y, N</td>
</tr>
<tr>
<td>Bachelor of Engineering/Bachelor of Laws</td>
<td>F, S, W</td>
<td>Y, N</td>
</tr>
<tr>
<td>Bachelor of Science/Bachelor of Laws</td>
<td>F, S, W</td>
<td>Y, N</td>
</tr>
</tbody>
</table>

School of the Built Environment

Bachelor of Engineering
- Architectural Engineering | F | Y | Y |
- Building Engineering | F | Y | Y |
- Building Surveying | F | Y | Y |
- Civil Engineering | F | Y | Y |
- Mechanical Engineering | F | Y | Y |
- Bachelor of Science
- Engineering and Business | F | Y | Y |
- Environmental Engineering | F | Y | Y |

School of Communications and Informatics

Bachelor of Engineering
- Computer Engineering | F | Y | Y |
- Electrical and Electronic Engineering | F | Y | Y |
- Multimedia Telecommunications | F | Y | Y |
- Bachelor of Science
- Applied Physics and Computing | F | Y | Y |
- Computer Science | F | Y | Y |
- Computer and Mathematical Sciences | F | Y | Y |
- Mathematical Sciences | F | Y | Y |
- Computer Science and Aviation | F | Y | Y |
- Computer Technology | F | Y | Y |
- Optoelectronics | F | Y | Y |
- Bachelor of Science (Honours)
- Computer Technology | F | Y | n/a |
- Physics | F | Y | n/a |
- Computer and Mathematical Sciences | F | Y | n/a |
- Computer Science | F | Y | n/a |

School of Life Sciences and Technology

Bachelor of Applied Science
- Chemistry | F | n/a | Y |

Bachelor of Science
- Biomedical Sciences | F, S | Y | Y |
- Medical and Environmental Biotechnology | S | Y | Y |
Part-time study may be approved at any stage of a course since progress is by individual subjects rather than by years. However, it is unrealistic to expect to complete a degree course entirely on a part-time basis.

Note: The details of the programs, courses and subjects set out in this Handbook might change after publication. To ensure that the information about Faculty of Engineering and Science courses is still accurate, contact the Faculty of Engineering and Science Executive Officer on (03) 9688 4191.

For further information about Engineering and Science courses:
Telephone: (03)9688 4191  Facsimile: (03)9688 4513
Email: BobRitchens@vu.edu.au  Internet: http://koala.vu.edu.au/academic.

## Faculty of Arts

<table>
<thead>
<tr>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generalist Degree Programs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Arts – Footscray</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Bachelor of Arts – St Albans</td>
<td>S</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Specialist Degree Programs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Arts (Advocacy &amp; Mediation)</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Bachelor of Arts (Asian Studies)</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Bachelor of Arts (Community Development)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Asia-Pacific Stream</td>
<td>S</td>
<td>Y</td>
</tr>
<tr>
<td>– Australian Stream (3rd year only)</td>
<td>S</td>
<td>Y</td>
</tr>
<tr>
<td>Bachelor of Arts (Computer Mediated Art)</td>
<td>S</td>
<td>Y</td>
</tr>
<tr>
<td>Bachelor of Arts (Globalisation Studies)</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Bachelor of Arts (Human Services)</td>
<td>S</td>
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<td>Bachelor of Communication (Public Relations)</td>
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<td>Bachelor of Psychology (Interpersonal &amp; Organisational)</td>
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<tr>
<td>Bachelor of Arts (Asian Studies)</td>
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Note: The details of the programs, courses and subjects set out in this Handbook might change after publication. To ensure that the information about Faculty of Arts courses is still accurate, contact the Faculty of Arts Executive Officer on (03) 9365 2369.

**Faculty of Business and Law**

### School of Accounting and Finance

**BACHELOR OF BUSINESS**

<table>
<thead>
<tr>
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**BACHELOR OF BUSINESS COMBINED DEGREES**

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### School of Applied Economics

**BACHELOR OF BUSINESS**

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<td>Financial Risk Management</td>
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<tr>
<td>Bachelor of Business (Honours) Applied Economics</td>
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**Campus, Full-time, Part-time**

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<tr>
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### School of Hospitality, Tourism and Marketing

**BACHELOR OF BUSINESS**

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<td>Tourism Management</td>
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<td>Marketing</td>
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<tr>
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</table>
- Marketing/Hospitality Management  F Y Y
- Marketing/Tourism Management  F Y Y
- Regional Tourism Management  F Y Y
- Tourism/Small Enterprise Management  F Y Y
- Marketing/Applied Economics  F Y Y
- Marketing/International Trade  F,K Y Y
- Retail Management/Marketing  F Y Y
- Marketing/Electronic Commerce  F Y Y
- Marketing/Music Industry  F Y Y
- Hotel, Restaurant and Catering Management  F Y Y
- Management/Marketing  B Y Y
- Tourism Management/Information Systems  F Y Y
- Bachelor of Business (Honours) – Marketing  F,C Y Y

School of Information Systems

- Bachelor of Business COMBINED DEGREES
  - Bachelor of Laws/Bachelor of Business Marketing  F Y Y
  - BA Asian Studies/BBus Tourism Management  F Y Y
  - BA Recreation Management/BBus Tourism Management  F Y Y
  - BA Sports Administration/BBus Marketing  B Y Y
  - Bachelor of Business Marketing/Bachelor of Psychology  F Y Y
  - Bachelor of Business Marketing/Advanced Diploma of  Hospitality (Management)  B Y Y

School of Information Systems

- Bachelor of Business
  - Information Systems  F Y Y
  - Computer Systems Support  W,H Y Y
  - Electronic Commerce  W Y Y
  - Electronic Commerce/Transport and Logistics  W Y Y
  - Accounting/Information Systems  F Y Y
  - Tourism Management/Information Systems  F Y Y
  - Electronic Commerce/Marketing  F Y Y
  - Electronic Commerce/Music Industry  F Y Y
  - Electronic Commerce/International Trade  F Y Y
  - Electronic Commerce/Retail Management  F Y Y
  - Accounting/Electronic Commerce  W Y Y
  - Bachelor of Business (Honours) Information Systems  F,C Y Y

BACHELOR OF BUSINESS COMBINED DEGREES

- Bachelor of Arts/BBus Information Systems  S Y Y
- Bachelor of Business/BBus Electronic Commerce  F Y Y
- Bachelor of Laws/BBus Electronic Commerce  F Y Y

School of Law

BACHELOR OF LAWS

- Law  F Y Y
- Graduate Entry  F,Q Y Y

BACHELOR OF BUSINESS

- Commercial Law  F Y Y
- Accounting/Commercial Law  F Y Y

Campus

- Bachelor of Business COMBINED DEGREES
  - Bachelor of Laws/Bachelor of Arts  F,Q
  - Bachelor of Laws/BBus Accounting  F Y Y
  - Bachelor of Laws/BBus Applied Economics  F Y Y
  - Bachelor of Laws/BBus Electronic Commerce  F Y Y
  - Bachelor of Laws/BBus International Trade  F Y Y
  - Bachelor of Laws/BBus Music Industry  F Y Y
  - Bachelor of Laws/BBus Marketing  F Y Y
  - Bachelor of Laws/BBus Tourism Management  F,Q Y Y
  - Bachelor of Laws/BBus of Science  F,S,W,Q Y Y

School of Management

BACHELOR OF BUSINESS

- Management  F,B Y Y
- Human Resource Management  F Y Y
- Service and Operations Management  F Y Y
- Strategic and Financial Management  F Y Y
- Hospitality Management/Human Resource Management  F Y Y
- Business Management/Marketing  B Y Y
- Bachelor of Business (Honours) Management  F,C Y Y

BACHELOR OF BUSINESS COMBINED DEGREES

- Bachelor of Laws/BBus Management  F Y Y
Faculty of Human Development

School of Education

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<th>Campus</th>
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<th>Part-time</th>
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<td>Bachelor of Arts</td>
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<tr>
<td>– Computer Mediated Art</td>
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<tr>
<td>– Computer Mediated Art &amp; Multimedia</td>
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<tr>
<td>– Early Childhood Education</td>
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<tr>
<td>– Youth Studies</td>
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<tr>
<td>Bachelor of Education</td>
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<tr>
<td>– Four-Year Pre-Service Program P-12</td>
<td>F,M</td>
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<tr>
<td>– Post-Registration (Year 4)</td>
<td>F,M</td>
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<tr>
<td>Bachelor of Education (Nyerna Studies)</td>
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incorporating:

– Bachelor of Education (Nyerna Studies)
– Bachelor of Arts (Nyerna Studies)
– Diploma of Community Services – Youth Work
– Associate Diploma of Arts – Recreation/Fitness Leadership
– Certificate in Occupational Studies – Social and Community Services

School of Health Sciences

Non-Award Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Campus</th>
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<tbody>
<tr>
<td>First Aid in the Workplace Certificate: Level 1 &amp; 2^</td>
<td>C</td>
<td>Y</td>
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<tr>
<td>Certificate of Advanced Airway Management (Pre-hospital)^</td>
<td>C,O</td>
<td>Y</td>
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<tr>
<td>Certificate in Advanced Airway Management^</td>
<td>C,O</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Certificate in Emergency Intravenous Therapy (Pre-hospital)^</td>
<td>C,O</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Certificate in Venipuncture and Venous Cannulation^</td>
<td>C,O</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Certificate in Emergency Intravenous Therapy^</td>
<td>C,O</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Certificate in Advanced Life Support (Pre-hospital)^</td>
<td>C,O</td>
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incorporating:

Certificate in Advanced Life Support^ | C,O | Y | Y |
Certificate in Semi Automatic External Defibrillation^ | C | Y | Y |

Award Courses

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<tr>
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<tr>
<td>– Clinical Dermal Therapies</td>
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<td>– Natural Medicine</td>
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<td>– Paramedic (3-Year Pre-service)</td>
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<td>– Paramedic (1-Year Conversion)</td>
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<td>Y</td>
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<tr>
<td>– Chinese Medicine (Acupuncture)/(Chinese Herbal Medicine)</td>
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<td>Y</td>
<td>n/a</td>
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<tr>
<td>Bachelor of Science</td>
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<tr>
<td>– Clinical Sciences</td>
<td>C</td>
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School of Human Movement, Recreation and Performance

Non-Award Courses

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<td>Fitness Instructor Module ^</td>
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<td>Aerobic Module^</td>
<td>F</td>
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<td>Core Unit (Vic Fit)^</td>
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<td>Aqua Module^</td>
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<td>Personal Trainers Module ^</td>
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<td>Children and Adolescent Exercise Module^</td>
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<td>Exercise to Music^</td>
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Award Courses

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<tr>
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<tr>
<td>– Human Movement</td>
<td>F</td>
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<tr>
<td>– Physical Education (Secondary)</td>
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<td>– Physical Education and Physics#</td>
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<tr>
<td>Bachelor of Arts</td>
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<td>– Performance Studies</td>
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</table>
- Performance and Multimedia  F  Y  n/a
- Fitness Leadership*  M  Y  Y
- Recreation Leadership  M,F  Y  Y
- Recreation Management  F  Y  n/a
- Recreation Management/Bachelor of Business – Tourism Management  F  Y  Y
- Sports Administration  B  Y  Y
- Sports Administration/Bachelor of Business – Management  B  Y  Y
- Sports Administration/Bachelor of Business – Marketing  B  Y  Y
- Bachelor of Applied Science (Honours)  
- Human Movement  F  Y  n/a
- Bachelor of Arts (Honours)  
- Performance Studies  F  Y  Y
- Recreation Management  F  Y  Y

**School of Nursing**

<table>
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<td>Bachelor of Health Science</td>
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<tr>
<td>– Nursing (Post-Registration)</td>
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<td>– Nursing (Honours)</td>
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<tr>
<td>Bachelor of Midwifery#</td>
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</table>

^Continuing Education Courses

*Offered to continuing students only

#Subject to final accreditation

**Note:** The details of the programs, courses and subjects set out in this Handbook might change after the date of publication. To ensure that information about Faculty of Human Development courses is still accurate, contact the Faculty of Human Development Executive Officer on (03) 9688 4164.
### Postgraduate Courses

#### Faculty of Engineering and Science

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<tbody>
<tr>
<td><strong>Centre for Environmental Safety and Risk Engineering</strong>&lt;br&gt;Doctor of Philosophy</td>
<td>W</td>
<td>Y</td>
</tr>
<tr>
<td>Graduate Certificate&lt;br&gt;– Performance-based Building and Fire Codes</td>
<td>W</td>
<td>n/a</td>
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<tr>
<td>Graduate Diploma&lt;br&gt;– Building Fire Safety and Risk Engineering</td>
<td>W</td>
<td>n/a</td>
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<tr>
<td>Master of Engineering (Coursework)&lt;br&gt;– Building Fire Safety and Risk Engineering</td>
<td>W</td>
<td>n/a</td>
</tr>
<tr>
<td>Master of Engineering (Research)&lt;br&gt;Master of Science in Occupational Safety and Health</td>
<td>W</td>
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<tr>
<td>Master of Science in Occupational Hygiene</td>
<td>W</td>
<td>n/a</td>
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<tr>
<td><strong>Centre for Packaging, Transportation and Storage</strong>&lt;br&gt;Doctor of Philosophy</td>
<td>W</td>
<td>Y</td>
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<tr>
<td>Master of Engineering (Research)</td>
<td>W</td>
<td>Y</td>
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<tr>
<td>Graduate Certificate&lt;br&gt;– Intermodal Freight Systems</td>
<td>W</td>
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<tr>
<td><strong>School of Communications and Informatics</strong>&lt;br&gt;Master of Engineering (Research)</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Master of Science (Research)</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Doctor of Philosophy</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Graduate Diploma&lt;br&gt;– Communication Systems</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>– Computer Science</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>– Computer and Mathematical Sciences</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>– Multimedia Information Networking</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>– Software Engineering</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Master of Engineering Science (Coursework)&lt;br&gt;– Computer Systems Engineering</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Master of Engineering&lt;br&gt;– Microelectronic Engineering</td>
<td>F</td>
<td>N</td>
</tr>
<tr>
<td>– Electrical and Electronic Engineering</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Master of Engineering Science (Coursework)&lt;br&gt;– Telecommunication Engineering</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Master of Science&lt;br&gt;– Computer Science (coursework)</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>– Computer and Mathematical Sciences (coursework)</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>– Software Engineering</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td><strong>School of Life Sciences and Technology</strong>&lt;br&gt;Doctor of Philosophy</td>
<td>F,S,W</td>
<td>Y</td>
</tr>
<tr>
<td>Graduate Diploma&lt;br&gt;– Environmental Management</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Master of Science (Coursework)&lt;br&gt;– Environmental Management</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>– Food Science and Technology</td>
<td>W</td>
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<tr>
<td>Master of Science (Research)</td>
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<tr>
<td><strong>School of the Built Environment</strong>&lt;br&gt;Doctor of Philosophy</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Master of Engineering (Research)</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Graduate Certificate&lt;br&gt;– Project Management</td>
<td>F</td>
<td>Y</td>
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<tr>
<td>Graduate Diploma&lt;br&gt;– Project Management</td>
<td>F</td>
<td>Y</td>
</tr>
<tr>
<td>Master of Engineering (Coursework)&lt;br&gt;– Project Management</td>
<td>F</td>
<td>Y</td>
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</table>
**Faculty of Arts**

**Higher Degrees by Research**
- Master of Arts by Research (S,F) Y Y
- Doctor of Philosophy by Research (S,F) Y Y
- Master of Social Work by Research (S) Y Y

**Postgraduate Programs by Coursework**
- Graduate Certificate in Asian and Pacific Studies (General Stream) (F) Y Y
- Graduate Certificate in Asian and Pacific Studies (Community Development Stream) (S) Y Y
- Graduate Certificate in Communication (C) Y Y
- Graduate Certificate in Women's Studies (C) N Y
- Graduate Diploma in Applied Psychology (S) Y Y
- Graduate Diploma in Asian and Pacific Studies (General Stream) (F) Y Y
- Graduate Diploma in Asian and Pacific Studies (Community Development Stream) (S) Y Y
- Graduate Diploma in Communication (C) Y Y
- Graduate Diploma in Counselling (S) N Y
- Graduate Diploma in Modern Languages (Graduate Diploma in Psychological Studies) (S) N Y
- Graduate Diploma in Women's Studies (C) N Y
- Master in Counselling (S) N Y
- Master of Arts in Asian and Pacific Studies (General Stream) (F) N Y
- Master of Arts in Asian and Pacific Studies (Community Development Stream) (S) N Y
- Master of Arts in Communication (C) Y Y
- Master of Arts in Women's Studies (C) N Y
- Master of Applied Psychology
  - Community Psychology Stream (S) Y Y
  - Sport Psychology Stream (F) Y Y
  - Health Psychology Stream (S) Y Y
  - Master of Psychoanalysis (S) N Y
  - Clinical Psychology Stream (S) Y Y
  - Clinical Neuropsychology Stream (S) Y Y
  - Doctor of Psychology
  - Clinical Psychology Stream (S) Y Y
  - Clinical Neuropsychology Stream (S) Y Y

**Faculty of Business and Law**

**Campus** | **Full-time** | **Part-time**
---|---|---
**Victoria Graduate School of Business**
- Master of Business Administration (C,P,K,D) Y Y
- Master of Business Administration (International) (C)
- Doctor of Business Administration (C) Y Y
- Master of Business by Research (C) Y Y
- Doctor of Philosophy (C) Y Y

**School of Accounting and Finance**
- Graduate Certificate in Accounting (C,H,P,K) Y Y
- Master of Business in Accounting (C) Y Y
- Master of Business in Finance (C) Y Y
- Master of Business in Professional Accounting (C,H,P,K) Y Y
- Master of Business by Research (C) Y Y
- Doctor of Philosophy (C) Y Y
### School of Applied Economics

<table>
<thead>
<tr>
<th>Program</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
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</thead>
<tbody>
<tr>
<td>Master of Business in Business Economics</td>
<td>C, Y</td>
<td>Y</td>
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</tr>
<tr>
<td>Master of Business in International Trade</td>
<td>C, Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in International Music and Entertainment Business</td>
<td>C, Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Certificate in Statistics</td>
<td>C</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Graduate Certificate in Retail Management (Offshore)</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Retail Management (Offshore)</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business by Research</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>C</td>
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</table>

### School of Hospitality, and Marketing

<table>
<thead>
<tr>
<th>Program</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
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<tbody>
<tr>
<td>Master of Business in Hospitality Management</td>
<td>C, Y</td>
<td></td>
<td></td>
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<tr>
<td>Master of Business in Hospitality Management (Professional Practice)</td>
<td>C, Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Marketing</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Tourism Management</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Hospitality and Tourism Marketing</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Electronic Commerce/Marketing</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Hospitality and Tourism Education</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Sports Tourism</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business by Research</td>
<td>F,C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>F,C</td>
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### School of Information Systems

<table>
<thead>
<tr>
<th>Program</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
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<tbody>
<tr>
<td>Graduate Certificate in Enterprise Resource Planning Systems</td>
<td>C</td>
<td></td>
<td></td>
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<tr>
<td>Master of Business, Enterprise Resource Planning Systems</td>
<td>C</td>
<td></td>
<td></td>
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<tr>
<td>Graduate Diploma in Business Computing</td>
<td>C,R</td>
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<tr>
<td>Master of Business in Information Systems</td>
<td>C,R</td>
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<td></td>
</tr>
<tr>
<td>Master of Business E-Commerce/Marketing</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business by Research</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
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### School of Law

<table>
<thead>
<tr>
<th>Program</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
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</thead>
<tbody>
<tr>
<td>Graduate Certificate in Australian Immigration Law</td>
<td>C</td>
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<tr>
<td>Graduate Diploma of International Commercial Law</td>
<td>D,K,P,H</td>
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<tr>
<td>Masters in Comparative Commercial Law</td>
<td>C</td>
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<tr>
<td>Masters of Laws</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters of International Commercial Law</td>
<td>D,K,P,H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business by Research</td>
<td>C</td>
<td></td>
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<tr>
<td>Doctor of Juridical Science</td>
<td>C,Q</td>
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<tr>
<td>Doctor of Philosophy</td>
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### School of Management

<table>
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<tr>
<th>Program</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Business in Management Practice</td>
<td>C</td>
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<td></td>
</tr>
<tr>
<td>Master of Business in Event Management</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business in Industrial Relations/Human Resource Management</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Business by Research</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>C</td>
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### Faculty of Human Development

<table>
<thead>
<tr>
<th>Course</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
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<tbody>
<tr>
<td>Graduate Diploma in Dementia Care and Service</td>
<td>C,O</td>
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<tr>
<td>Graduate Program in Aged Services Management incorporating:</td>
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<tr>
<td>- Graduate Diploma in Aged Services Management</td>
<td>C,O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Master of Health Science – Aged Services Management</td>
<td>C</td>
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### School of Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Campus</th>
<th>Full-time</th>
<th>Part-time</th>
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<tbody>
<tr>
<td>Graduate Certificate in Teaching Studies of Asia</td>
<td>F</td>
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<tr>
<td>Graduate Diploma in Secondary Education</td>
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</tbody>
</table>

Note: The details of the programs, courses and subjects set out in this Handbook might change after publication. To ensure that the information about Faculty of Business and Law courses is still accurate, contact the Faculty of Business and Law Executive Officer on (03) 9688 4471.
Graduate Program in Education for Professional Development

incorporating:
– Graduate Certificate in Education for Professional Development F n/a Y
– Graduate Diploma in Education for Professional Development F n/a Y

Graduate Program in Education and Training

incorporating:
– Graduate Certificate in Education and Training F n/a Y
– Graduate Diploma in Education and Training F Y Y
– Master of Education – Education and Training F Y Y

Graduate Program in TESOL & Literacy

incorporating:
– Graduate Certificate in TESOL F Y Y
– Graduate Certificate in Literacy F Y Y
– Graduate Diploma in TESOL F Y Y
– Graduate Diploma in TESOL and Literacy F Y Y
– Master of TESOL F,Y Y Y
– Master of TESOL and Literacy F Y Y

Graduate Program in Tertiary Education

incorporating:
– Graduate Certificate in Tertiary Education F n/a Y
– Graduate Diploma in Tertiary Education F Y Y

Graduate Program in Experiential Learning & Development

incorporating:
– Graduate Certificate in Experiential Learning and Development F Y Y
– Graduate Diploma in Experiential Learning and Development F Y Y
– Master of Education – Experiential Learning and Development F Y Y

Master of Education (by Research) F,Y Y Y
Doctor of Education F Y Y
Doctor of Philosophy F Y Y

School of Health Sciences

Graduate Diploma in Clinical Chinese Medicine S Y Y
Graduate Diploma in Complementary Therapies S Y Y
Graduate Diploma in Prepared Chinese Medicine C S Y Y
Graduate Diploma in Western Herbal Medicine C Y Y

Campus Full-time Part-time

Graduate Program in Paramedicine and Pre Hospital Care

incorporating:
– Graduate Certificate in Aeromedical Care I Y Y
– Graduate Certificate in Aeromedical Rescue & Retrieval I Y Y
– Graduate Certificate in Emergency Service Education# I Y Y
– Graduate Certificate in Emergency Service Management# I Y Y
– Graduate Certificate in Hyperbaric Medicine I Y Y
– Graduate Certificate in Intensive Care Paramedic I Y Y
– Graduate Certificate in Paediatric Emergencies# I Y Y
– Graduate Certificate in Paramedic Practitioner I Y Y
– Graduate Certificate in Pre-Hospital Care I Y Y
– Graduate Diploma in Paramedics I Y Y
– Graduate Diploma in Pre-Hospital Care I Y Y

Master of Health Science
– Osteopathy C Y n/a
– Osteopathy (for medical practitioners) C n/a Y
– (by Coursework) S Y Y
– (by Research) S Y Y

Doctor of Philosophy S Y Y

School of Human Movement, Recreation and Performance

Graduate Diploma in Exercise and Sport Sciences F Y Y

Graduate Program in Ageing, Disability and Recreation Management

incorporating:
– Graduate Certificate in Ageing, Disability and Leisure F Y Y
– Graduate Certificate in Ageing, Disability and Recreation Management F Y Y
– Graduate Diploma in Ageing, Disability and Recreation Management F Y Y
– Master of Arts – Ageing, Disability and Recreation Management F Y Y

Graduate Program in Loss and Grief

incorporating:
– Graduate Certificate in Loss and Grief Education C Y Y

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- Graduate Certificate in Loss and Grief Counselling  C*  Y  Y
- Graduate Diploma in Loss and Grief Counselling  C*  Y  Y

Graduate Program in Sport and Recreation Management incorporating:
- Graduate Certificate in Sport & Recreation Management  F  Y  Y
- Graduate Certificate in Sport & Recreation Management/Operations  F  Y  Y
- Graduate Diploma in Sport & Recreation Management  F  Y  Y
- Master of Arts – Sport & Recreation Management (by coursework)  F  Y  Y

Graduate Program in Sport Business incorporating:
- Graduate Diploma in Sport Business  C  Y  Y
- Master of Sport Business  C  n/a  Y

Graduate Program in Exercise Rehabilitation incorporating:
Graduate Diploma in Exercise for Rehabilitation  F  Y  Y
Master of Applied Science – Exercise Rehabilitation  F  Y  Y

Master of Applied Science
- Human Performance (by coursework)  F  Y  Y
- (by Research)  C,F  Y  Y
Master of Arts (by Research)  F  Y  Y
Doctor of Philosophy  C,F  Y  Y

*Two subjects will be taught at the St Albans Campus.

School of Nursing
Graduate Diploma in Substance Abuse Studies  S  Y  Y

Master of Nursing incorporating:
- Graduate Certificate in Cardiothoracic Nursing  S  Y  Y
- Graduate Certificate in Cancer Nursing  S  Y  Y
- Graduate Certificate in Emergency Nursing  S  Y  Y
- Graduate Certificate in Gerontic Nursing#  S  Y  Y
- Graduate Certificate in Neuroscience Nursing  S  Y  Y
- Graduate Certificate in Orthopaedic Nursing  S  Y  Y
- Graduate Certificate in Paediatric Nursing  S  Y  Y
- Graduate Certificate in Palliative Care Nursing  S  Y  Y
- Graduate Diploma in Cardiothoracic Nursing  S  Y  Y
- Graduate Diploma in Cancer Nursing  S  Y  Y
- Graduate Diploma in Emergency Nursing  S  Y  Y
- Graduate Diploma in Gerontic Nursing#  S  Y  Y
- Graduate Diploma in Neuroscience Nursing  S  Y  Y
- Graduate Diploma in Orthopaedic Nursing  S  Y  Y
- Graduate Diploma in Paediatric Nursing  S  Y  Y
- Graduate Diploma in Palliative Care Nursing  S  Y  Y

Master of Midwifery incorporating:
- Graduate Diploma in Midwifery  S  Y  Y

Master of Nursing (by Research)  S  Y  Y
Doctor of Philosophy  S  Y  Y

#Subject to final accreditation

Note: The details of the programs, courses and subjects set out in this Handbook might change after the date of publication. To ensure that information about Faculty of Human Development courses is still accurate, contact the Faculty of Human Development Executive Officer on (03) 9688 4164.
Victoria University TAFE Courses 2002

This section lists all the courses offered by Victoria University in TAFE and higher education.

All courses are offered subject to confirmation of PETE funding and authority to conduct, and minimum enrolment levels. List correct as at October 2001.

**Note:** Each course name is followed by its course code. If the course also includes a name in square brackets [], this is the ‘local’ course title used by Victoria University.

### School of Building, Electrical and Information Technology

#### Building and Construction Department

| Certificate I in Boatbuilding | 15562VIC [Pre-Apprenticeship] |
| Certificate II in Boatbuilding | 15563VIC [Traineeship] |
| Certificate III in Boatbuilding | 15564VIC [Apprenticeship] |
| Certificate I in Construction | BCG10198 |
| Certificate II in General Construction | BCG20198B [Bricklaying – Pre-Apprenticeship] |
| Certificate III in General Construction (Bricklaying/Blocklaying) | BCG30698 [Apprenticeship] |
| Certificate II in General Construction | BCG20198 [Carpentry – Pre-Apprenticeship] |
| Certificate III in General Construction (Carpentry – Framework/Formwork/Finishing) | BCG30798 [Apprenticeship] |
| Carpenter and Joinery (Joinery/Stairbuilding/Shopfitting) | 3211CBB [Pre-Apprenticeship] |
| Apprenticeship Certificate in Joinery/Stairbuilding/Shopfitting | 20083VIC |
| Certificate II in Furnishing (Furniture Manufacturing Pre-Apprenticeship) | 2202ACC [Cabinet Making] |
| Certificate III in Furnishing (Cabinet Making) | 2302ABC [Apprenticeship] |
| Diploma of Building Design and Drafting | SA3474 |
| Certificate IV in Building Drafting | SA3476 |
| Diploma of Building | SA3475 |
| Certificate IV in Building | SA3477 |
| Diploma of the Built Environment | SA3472 |
| Diploma of Building Surveying | SA3473 |

#### Building Services and Special Trades Department

| Apprenticeship Certificate in Plumbing and Gasfitting | 20085VIC |
| Certificate I in Building and Construction (Plumbing) | 2102ABC |
| Certificate IV in Plumbing (Services Design) | 2402ADC |
| Certificate II in General Construction | BCG20198P [Painting and Decorating – Pre-Apprenticeship] |
| Certificate III in General Construction (Painting & Decorating) | BCG30498 [Apprenticeship] |
| Apprenticeship Certificate in Sign Industry | 20088VIC |
| Certificate II in Sign Industry | 20087VIC |
| Certificate IV in Sign Technology | 21000VIC |

#### Electrotechnology Department

| Certificate I in Electrical (Pre-Apprenticeship) | 14935VIC |
| Certificate IV in Electrical | 2406ANC [Motor Control Stream] |
| Diploma of Computer (Internetworking) Systems | 2506AJC |
| Certificate IV in Computer (Internetworking) Systems | 2406APC |
| Certificate II in Computer (Internetworking) Systems | 2206AJC |
| Certificate I in Computer (Internetworking) Systems | 2106AHC |
| Certificate III in Electrotechnology Entertainment and Servicing | UTE30799 [Streams in Audio – Analogue, Audio – Digital, Electronic Appliances, and Video] |
| Certificate III in Electrotechnology Computer Systems | UTE30599 [Streams in Business Equipment, Control, Data Capture, Networks] |
| Certificate III in Electrotechnology Communications | UTE30499 [Streams in Broadcast, Microwave and Satellite] |
| Advanced Diploma in Electronics Engineering Analogue and Digital (Streams in Analogue and Digital, Communications and Medical Equipment) | UTE60399 |
| Advanced Diploma in Computer Systems Engineering | UTE60199 |

#### Information Technology Department

| Certificate II in Information Technology (Computer Applications) | 2209ABC |
| Certificate III in Information Technology (Software Applications) | ICA30199 [Web Pages] |
| Certificate IV in Information Technology | ICA20199 |
| Certificate IV in Multimedia | 14933VIC |
| Diploma of Information Technology | ICA50299 |
| Diploma of Multimedia | 14934VIC |
| Diploma of Information Technology | 21104VIC [Specialising in Network and Internet Technologies] |
School of Business

Administrative and Legal Studies Department
Certificate IV in Electronic Publishing2403AFC incorporating Certificate II in Desktop Publishing2203AFC
Certificate III in Business (Legal Administration)BSA30200
Certificate IV in Business (Legal Services)BSA40200
Advanced Diploma of Business (Legal Practice)20055VIC
Diploma of Business (Administration)BSA50197
Certificate IV in Business (Administration)BSA40197
Certificate III in Business (Office Administration)BSA30197
Certificate II in Business (Office Administration)BSA20197

Management and Marketing Department
Diploma of Frontline ManagementQLD7042
Certificate IV in Frontline ManagementQLD7041
Certificate III in Frontline ManagementQLD7040
Certificate IV in Business (Human Resource Administration)20051VICB
Diploma of Business (Human Resource Operations)20053VICB
Advanced Diploma of Business (Human Resource Management)20055VICB
Advanced Diploma of Management14246ACT
Diploma of Management14247ACT
Certificate IV in Management14248ACT
Certificate III in Management14249ACT
Advanced Diploma of Business (Operations Management)20055VICC
Diploma of Business (Operations Management)20053VICC
Certificate IV in Business (Advertising)20051VIC
Diploma of Business (Advertising)20053VIC
Advanced Diploma of Business (Advertising)20055VICA
Advanced Diploma of Business (Marketing)20053VICF
Diploma of Business (Marketing)20053VICF
Certificate IV in Business (Sales and Marketing)20051VICF
Advanced Diploma of Business (International Business)20055VICE
Diploma of Business (International Trade)20053VICE
Certificate IV in Business (International Trade)20051VICE
Advanced Diploma of Business (Public Relations)20055VIC-D

Financial Services Department
Certificate III in Financial ServicesFNB30199
Advanced Diploma in AccountingFNB60299
Diploma in AccountingFNB50299
Diploma of Business (Banking and Finance)90025NSW
Course in Real Estate for Agents' Representatives2004AAA
Certificate IV in Business (Estate Agency Practice)2404ADA
Course in Introduction to Call Centre OperationsBBI07
Certificate II in Telecommunications (Call Centres)ICT20499
Certificate III in Telecommunications (Call Centres)ICT30599
Certificate IV in Telecommunications (Call Centres)ICT40599
Diploma in Customer Contact Management3113BBCCM0 [contact Department for details]

Western Business Enterprise Centre
Certificate II in Security (Guarding)PRS20198
Certificate III in Security (Guarding)PRS30198
Certificate III in Small Business Management2304ACC
Certificate IV in Small Business Management15703SA
Diploma of Small Business Management15702SA
Certificate IV in Business Facilitation3113WSB57

School of Engineering, Science and Industrial Skills

Automotive and Fabrication Department
Certificate I in EngineeringMEM10198F
Certificate II in Engineering (Production)MEM20198F
Certificate II in Engineering (Production Technology)MEM20298F
Certificate III in Engineering (Production Systems)MEM30198F
Certificate III in Engineering (Fabrication Trade)MEM30398 [Light and Heavy]
Certificate IV in Engineering Technology20018VICF [Fabrication]
Advanced Diploma of Engineering Technology20020VICF [Fabrication]
Diploma of Engineering Technology 2001 [Fabrication]
Certificate I in Automotive AUR10199
Certificate II in Automotive Administration (Clerical) AUR20199
Certificate II in Automotive Mechanical (Drive Line) AUR20999
Certificate II in Automotive Mechanical (Exhaust Fitting and Repair) AUR21099
Certificate II in Automotive Mechanical (Radiator Repairs) AUR21299
Certificate II in Automotive Mechanical (Steering and Suspension) AUR21399
Certificate II in Automotive Mechanical (Tyre Fitting and Repair Light) AUR21599
Certificate II in Automotive Mechanical (Underbody) AUR21699
Certificate II in Automotive Mechanical (Vehicle Servicing) AUR21799
Certificate II in Automotive Technology 21110 [VIC]
Certificate III in Automotive Repair, Services and Retail 2306 AGB
[Streams in Light Vehicle Mechanic, Panel Beating, Vehicle Painting]
Certificate III in Automotive Mechanical (Automotive Transmission) AUR30299
Certificate III in Automotive Mechanical (Brakes) AUR30399
Certificate III in Automotive Mechanical (Diesel Fuel Specialist) AUR30599
Certificate III in Automotive Mechanical (Drive Line) AUR30699
Certificate III in Automotive Mechanical (Light Vehicle) AUR31099
Certificate III in Automotive Mechanical (Motor Cycle) AUR31199
Certificate II in Automotive Sales (Automotive Aftermarket) AUR21999
Certificate II in Automotive Sales (Replacement Parts and Accessories) AUR22099
Certificate II in Automotive Sales (Vehicle) AUR22299
Certificate II in Automotive Sales (Warehouse) AUR22399
Certificate III in Automotive Sales (Parts Interpretation) AUR31399
Certificate II in Automotive Vehicle Body (Accessory Fitting - Mechanical) AUR22499
Certificate II in Automotive Vehicle Body (Detailing) AUR22599
Certificate II in Automotive Vehicle Body (Dismantling) AUR22699
Certificate II in Automotive Vehicle Body (Paint/Panel Preparation) AUR22899
Certificate II in Automotive Vehicle Body (Window Tinting) AUR22999
Certificate III in Automotive Vehicle Body (Panel Beating) AUR31699
Certificate III in Automotive Vehicle Body (Vehicle Painting) AUR31899
Certificate IV in Automotive AUR40199
Certificate II in Bicycles (Services) AUR23099
Certificate III in Bicycles (Mechanics) AUR31999
Certificate II in Marine (Sales) AUR23199
Certificate II in Marine (Services) AUR23299
Certificate III in Marine (Installation) AUR32199
Certificate III in Marine (Mechanics) AUR32299
Certificate II in Marine (Sales) AUR32399
Certificate II in Outdoor Power Equipment (Services) AUR23999
Certificate III in Outdoor Power Equipment (Mechanics) AUR32499
Certificate III in Outdoor Power Equipment (Sales) AUR32599

**Industrial Skills Training Centre**

Course in Cranes [contact Department for details]
Course in Rigging – Basic [contact Department for details]
Course in Rigging – Intermediate [contact Department for details]
Course in Rigging – Advanced [contact Department for details]
Course in Safe Lifting (Load Slinging) [contact Department for details]
Course in Scaffolding – Basic [contact Department for details]
Course in Scaffolding – Limited Height [contact Department for details]
Course in Scaffolding – Intermediate [contact Department for details]
Course in Scaffolding – Advanced [contact Department for details]
Course in Dogging [contact Department for details]
Course in Earthmoving [contact Department for details]
Course in Trench Shor ting and Safety [contact Department for details]
Course in Forklift Operating [contact Department for details]
Course in Elevating Platform Vehicle Operators [contact Department for details]
Driver Training [contact Department for details]

Driver Education [contact Department for details]

Certificate III in Civil Construction (Plant) BCC30198
Certificate III in General Construction BCG31398
Certificate I in Transport and Distribution (Warehousing) TDT10197
Certificate II in Transport and Distribution (Warehousing) TDT20197
Certificate III in Transport and Distribution (Warehousing) TDT30197
Certificate I in Transport and Distribution (Road Transport) TDT10297
Certificate III in Transport and Distribution (Road Transport) TDT30297
Certificate II in Transport and Distribution (Road Transport) TDT20297
FACULTY OF ENGINEERING AND SCIENCE

Certificate III in Transport and Distribution (Mobile Crane Operations)/TDT30998
Certificate IV in Transport and Distribution (Mobile Crane Operations)/TDT40998
Certificate III in Road Transport (Motor Vehicle Driving Instruction)2311AEA
Course in Dangerous Goods2011ADC

Mechanical Manufacturing and Civil Engineering Department
Certificate I in Engineering Technology/2106AIC
Certificate II in Engineering Technology/2212AMC
Certificate III in Engineering Technology/2312ACC
Certificate II in Animal Studies/RUV20198
Certificate III in Animal Studies/RUV30198
Certificate II in Animal Technology/QLD3757
Certificate IV in Animal Technology/2411ARC
Diploma of Applied Science (Animal Technology)/QLD3522
Certificate IV in Veterinary Nursing/RUV40198
Certificate III in Occupational Health & Safety/QLD1893
Certificate IV in Occupational Health & Safety/QLD1892
Diploma of Occupational Health & Safety/QLD1891
Certificate III in Health (Hospital Pharmacy Technician)/2307AEC
Certificate IV in Food Technology/2406ASC
Certificate IV in Transport and Distribution (Warehousing)/TDT40197
Diploma of Transport Distribution (Logistics)/TDT51098
Advanced Diploma of Transport Distribution (Logistics)/TDT61098
Certificate III in Laboratory Skills/QLD3758
Certificate IV in Laboratory Techniques/PML50199
Diploma of Laboratory Technology/PML50199
Diploma of Laboratory Technology (Process Manufacturing Testing)/PML50199
Diploma of Laboratory Technology (Pathology Testing)/PML50199
Diploma of Laboratory Technology (Biological and Environmental Testing)/PML50199
Diploma of Laboratory Technology (Food Testing)/PML50199
Advanced Diploma of Laboratory Operations/PML60199
Certificate II in Horticulture/RHU20198
Certificate II in Horticulture (Production)/RHU20898
Certificate II in Horticulture (Nursery)/RHU20598
Certificate II in Horticulture (Arboriculture)/RHU20298
Certificate II in Horticulture (Landscape)/RHU20498
Certificate II in Horticulture (Turf Management)/RHU20798
Certificate II in Horticulture (Floriculture)/RHU20398
Certificate II in Horticulture (Landscape)/RHU20498
Diploma in Natural Resource Management/2509ACC

Science and Food Technology Department
Certificate II in Science (Bridging)/2212AMC
Certificate III in Science (Bridging)/2312ACC
Certificate II in Animal Studies/RUV20198
Certificate III in Animal Studies/RUV30198
Certificate II in Animal Technology/QLD3757
Certificate IV in Animal Technology/2411ARC
Diploma of Applied Science (Animal Technology)/QLD3522
Certificate IV in Veterinary Nursing/RUV40198
Certificate III in Occupational Health & Safety/QLD1893
Certificate IV in Occupational Health & Safety/QLD1892
Diploma of Occupational Health & Safety/QLD1891
Certificate III in Health (Hospital Pharmacy Technician)/2307AEC
Certificate IV in Food Technology/2406ASC
Certificate IV in Transport and Distribution (Warehousing)/TDT40197
Diploma of Transport Distribution (Logistics)/TDT51098
Advanced Diploma of Transport Distribution (Logistics)/TDT61098
Certificate III in Laboratory Skills/QLD3758
Certificate IV in Laboratory Techniques/PML50199
Diploma of Laboratory Technology/PML50199
Diploma of Laboratory Technology (Process Manufacturing Testing)/PML50199
Diploma of Laboratory Technology (Pathology Testing)/PML50199
Diploma of Laboratory Technology (Biological and Environmental Testing)/PML50199
Diploma of Laboratory Technology (Food Testing)/PML50199
Advanced Diploma of Laboratory Operations/PML60199
Certificate II in Horticulture/RHU20198
Certificate II in Horticulture (Production)/RHU20898
Certificate II in Horticulture (Nursery)/RHU20598
Certificate II in Horticulture (Arboriculture)/RHU20298
Certificate II in Horticulture (Landscape)/RHU20498
Certificate II in Horticulture (Turf Management)/RHU20798
Certificate II in Horticulture (Floriculture)/RHU20398
Certificate II in Horticulture (Landscape)/RHU20498
Diploma in Natural Resource Management/2509ACC

School of Further Education and Employment Services

Adult Literacy and Work Education Department
Certificate I in General Education for Adults (Foundation)/2112AFC
Certificate II in General Education for Adults/2212AKC
Certificate II in General Education for Adults (Further Study)/2212ALC
Specialised Programs
Certificate I in Vocational Studies (Transport and Distribution)/15598VIC
Diploma of Further Education/21015VIC
Certificate IV in Further Education/21014VIC
Certificate I in Work Education/21108VIC

Arts and Preparatory Programs Department
Diploma of Arts (Small Companies and Community Theatre)/21052VIC
Diploma of Arts (Professional Writing and Editing)/2124VIC

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Certificate IV in Professional Writing and Editing 21123VIC
Access Program – Women 2100KFM
Science for Nurses 2290HZB [Gateway to Nursing and the Health Sciences]
Preparation for Tertiary Studies [Arts] 2200LZO
Certificate I in ESL Access 14378VIC
Certificate II in ESL Access 14379VIC
Certificate I in General Education for Adults (Foundation) 2112AFC
Certificate II in General Education for Adults 2212AKC
Certificate II in General Education for Adults (Further Study) 2212ALC
Diploma of Liberal Arts 2503ANC
Certificate IV in Liberal Arts 2403AGC
Adult Victorian Certificate of Education (VCE) 2200LZV

Music Programs
Certificate IV in Music Industry Skills (Performance/Composition) 13057VIC
Certificate IV in Music Industry Skills (Sound Production) 14266VIC
Diploma of Sound Production 14475VIC
Diploma of Contemporary Music (Performance/Composition) 13058VIC
Certificate IV in Music Industry (Business) CUS40301

Language Studies Department
Certificate IV in ESL (Academic Purposes) 14374VIC
Certificate IV in ESL (Vocational Purposes) 14377VIC
Certificate IV in ESL (Access) 14381VIC
Certificate II in ESL (Academic Purposes) 14372VIC
Certificate II in ESL (Vocational Purposes) 14375VIC
Certificate II in ESL (Access) 14379VIC
Certificate III in ESL (Academic Purposes) 14373VIC
Certificate III in ESL (Vocational Purposes) 14376VIC
Certificate III in ESL (Access) 14380VIC
Certificate I in ESL (Access) 14378VIC

School of Human Services, Art and Multimedia

Art, Design and Multimedia Department
Diploma of Arts (Graphic Arts) 12861VIC
Diploma of Arts (Visual Art) 12857VIC
Certificate IV in Arts (Applied Design) 15727VIC
Advanced Diploma of Art (Electronic Design and Interactive Media) 2603AAC
Advanced Diploma of Arts (Graphic Design) 12862VIC
Certificate II in Arts (Interactive Multimedia) 2203AGB

Child Studies Department
Diploma of Community Services (Children’s Services) 250399
Certificate IV in Community Services (Children’s Services) 240399
Certificate III in Community Services (Children’s Services) 230399
Advanced Diploma in Community Services (Children’s Services) 220399

Health Services Unit
Certificate IV in Health (Nursing) 2407ADC
Certificate IV in Pathology Collection 2407ALC

Library Studies Unit
Diploma in Library and Information Services CUL50199
Certificate III in Library and Information Services CUL30199

Social and Community Studies Department
Diploma of Community Services (Welfare Studies) 2507ABC
Diploma of Social Science (Justice) 2504AIC
Certificate IV of Social Science (Justice) 2404AIC
Diploma of Community Services (Community Work) 250699
Diploma of Community Services (Youth Work) 250999
Diploma of Business (Community Services and Health Management) 2504AIC
Diploma of Community Services (Disability Work) 250799
Diploma of Community Services (Alcohol and Other Drugs Work) 250299
Certificate III in Community Services (Disability Work) 230799
Certificate IV in Community Services (Disability Work) 240799
Certificate II in Community Services (Community Work) 220499
Certificate III in Community Services (Community Work) 230699
Certificate IV in Community Services (Aged Care Work) 240199
Diploma in Counselling 3113GWD40

Sport and Recreation Department
Graduate Certificate in Career Counselling for Elite Performers (Dance/Music/Sport) [contact Department for details]
Certificate III in Fitness SRF30201 [contact Department for details]
Certificate II in Sport and Recreation SRO20199
Certificate III in Sport and Recreation SRO30199
Certificate IV in Sport and Recreation SRO40199
Certificate IV in Sport (Development) SRS40399
Certificate IV of Sports Science (Golf) 3113SRG35
Diploma of Sports Science (Golf) 3113SRG36
Diploma of Sport and Recreation SRO50199
Certificate III in Racing (Greyhound) – Kennelhand level 2 RGR30598

School of Hospitality and Personal Services

Personal Services Department
Certificate II in Modelling 2211ARC
Certificate II in Nail Technology WRB20199
Certificate III in Beauty WRB30199
Certificate IV in Beauty Therapy WRB40199
Diploma of Beauty Therapy WRB50199
Certificate II in Retail Cosmetic Assistant WRB20399
Diploma of Entertainment (Makeup) CUE50798
Certificate III in Health Science (Therapeutic Massage) 3113BT001
Certificate IV in Health Science (Remedial Massage) 3113BT002
Diploma of Health Science (Massage) WAO350
Certificate II in Hairdressing WRH20100
Certificate III in Hairdressing WRH30100
Certificate IV in Hairdressing WRH40100
Certificate I in Retail Operations WRR10197
Certificate II in Retail Operations WRR20197
Certificate III in Retail Operations WRR30197
Certificate IV in Retail Management WRR40197
Diploma of Retail Management WRR50197

Hospitality and Tourism Department
Certificate I in Hospitality (Kitchen Operations) THH11197
Certificate I in Hospitality (Operations) THH11097
Certificate II in Hospitality (Operations) THH21897 [Food and Beverage Services]
Certificate II in Hospitality (Operations) THH21897 [Housekeeping/Front Office]
Certificate II in Hospitality (Commercial Cookery) THH21297
Certificate III in Hospitality (Commercial Cookery) THT31597
Certificate III in Hospitality (Accommodation Services) THH32897
Certificate IV in Hospitality (Food and Beverage Supervision) THH42397
Diploma of Hospitality (Management) THH51297
Advanced Diploma of Hospitality (Management) THH60297
Certificate IV in Tourism (Team Leading) THT40298
Certificate IV in Tourism (Sales and Marketing) THT40198
Certificate III in Tourism (Visitor Information Services) THT30698
Certificate III in Tourism (Tour Operations) THT30498
Certificate III in Tourism (Retail/Travel Sales) THT30298
Diploma of Tourism (Marketing and Product Development) THT50198
Advanced Diploma of Tourism Management THT60198 [Marketing and Product Development]
Diploma of Tourism (Operations Management) THT50398
Advanced Diploma of Tourism Management THT60198 [Operations Management]