Please note

The text in this file has been automatically extracted and may contain minor errors. For the original version please consult the paper copy held in the Swinburne Library.
The information given in this handbook is intended as a guide for persons seeking admission to Swinburne Institute of Technology or Swinburne Technical College and shall not be deemed to constitute a contract or the terms thereof between Swinburne Institute of Technology or Swinburne Technical College and a student or any third party. Both divisions reserve the right to cancel, suspend or modify in any way the matters contained in this document.
This handbook is published both as a whole and in separate sections; one for each faculty of Swinburne Institute of Technology and one for Swinburne Technical College.

This general table of contents indicates, in conjunction with the tabbed section fly leaves, both the contents of an individual book and the location, in that book, of the individual sections.

If you are interested in a section which is not included in this book, these are available from the Information Office.
Swinburne was established in 1908 under the name of 'Eastern Suburbs Technical College: The first students were enrolled in 1909, when classes were begun in carpentry, plumbing and blacksmithing. The institution grew and prospered. Soon afterwards, a boys junior technical school and the first girls technical school in Victoria, were established. In 1913 the institution changed its name to Swinburne Technical College to commemorate the Hon. George Swinburne, a former mayor of Hawthorn and a member of the Parliament of Victoria, who was largely responsible for the initial establishment of the college. In 1965 Swinburne affiliated with the Victoria Institute of Colleges which was established in that year by an Act of the Parliament of Victoria to 'foster the development and improvement of tertiary education in technical, agricultural, commercial and other fields of learning (including the liberal arts and the humanities) in institutions other than in the universities of Victoria: The range of courses and the various levels at which they were offered grew to such an extent that in 1969, the boys and girls technical schools were taken over by the Victorian Education Department while the college remained as an autonomous institution. In 1980, the name was changed to Swinburne Institute of Technology. Swinburne continues to offer a wide range of professional and trade courses. To facilitate the operations of the college, teaching is carried out within two divisions, under the control of one college council. They are: Swinburne Institute of Technology — a tertiary 'college of advanced education' offering courses for professional qualifications (diploma and degree of Bachelor) and graduate qualifications (diploma and degree of Master). Enrolments in 1980 were 2,207 full-time and 2,912 part-time students. Swinburne Technical College — a technical and further education college, offering courses at middle-level or sub-professional, trade, technician and Tertiary Orientation Program levels. A number of specialist courses are provided also, for industry and the community. Enrolments in 1980 were 823 full-time and 4,237 part-time students.

Campus
The campus covers an area of approximately four hectares. It is close to the Glenferrie station on Burwood Road, Hawthorn, the geographical centre of the metropolitan area. It is well served by other means of public transport and is in close proximity to parklands. A new sports centre was completed recently and a number of projects are being planned for the future, including an art (graphic design) and film and television complex.

Coat of Arms
The coat of arms conferred on Swinburne College by the College of Arms on 25 June, 1969, is based on the coat of arms of the Swinburne family. At a period during the 12th-13th century, when the northern counties of England were ruled by the Scots, a knight of France came to the aid of Queen Margaret of Scotland. She rewarded him with a grant of land in what is now Northumberland, on the banks of the Swin Burn, a small river that flows into the North Tyne, where he built a castle. He became known as William Swinburne and soon the county reverted to the crown of England. The Swinburne coat of arms in medieval times was silver with three boars’ heads in triangular formation. In the 17th century, during the wars between the Stuart Kings and the Parliament of England, the Swinburnes fought for the royalists. After the restoration of Charles II in 1660, the head of the family was created a baronet for his services. The crest became a baronet’s coronet, with the boar’s head rising from it and the coat of arms, divided horizontally red and silver, was charged three cinquefoils counter-charged. Swinburne, now called Swinburne Institute of Technology holds a unique place among colleges of advanced education in Australia in the link that persists between the institution and the founder and his family. The conferring on the college of a modification of the family’s coat of arms preserves and strengthens that link.

The arms: The basic colours of red and white, and the cinquefoils charged on the shield, commemorate the arms of the Swinburne family. The omission of the third cinquefoil which appears in the family coat and the addition of the Bordure and the Mullets (Stars) are what are known heraldically as ‘differences: which may often serve to indicate an association with another armigerous body or family. The four Mullets in Cross symbolise the Southern Cross.

The crest: The demi-Boar and the cinquefoil perpetuate the Swinburne connection; the book is symbolic of learning.

The motto: The College of Arms’ translation of the motto is: Achievement through learning.
General information

Institute Council

Membership as at 31 August 1980

President
B.R. Martin, BMetE

Vice-Presidents
W.J. Braden, BA, BEd
N.P. Watson, AASA, ACIS

Members
W.R.S. Briggs, PhD, BSc(Hons), DipChemEng, ASTC, AR
W.P. Brown, DipCE, FICE, FIEAust, FIArb, MConsE Aust
R.S. Davie, BE(Mech), CEng, FIProdE, FIEAust, MACE
T. den Brinker
G.W. Fary
L.M. Jenkins, BCom, DipEd, FASA, MACE
Hon. Walter Jona, MP
D.H. Kottek, BE(Elec), DipEd, GradIEAust, MACS
W.R. Longworth, MSc, PhD, CChem, FRSC, FRACI, FAC
R.J. McCooey
B.J. MacDonald, BEc, DipEd
C.K. McDonald, MA, BSc, BEd, MACE
Fay Moore, DIM, TTIC
R.N. Morse, BSc, BE, FIEAust
L.E.A. Orton, MArch, DipArch(DSN), LFRAIA, ARIBA
A.D. Robinson
T. Rosauer, BArch, FRAIA, ARIBA
M.A. Rose, DipCE, BE, MIEAust
C.C. Scott, MEd, BA, BSc, ATT
A.P. Stark, DipMechE, TTTC, MIEAust
J.A. Wunderlich, MSc, Dr es Sc(Paris), ARACI

Chief Executive Officer
W.R. Longworth, MSc, PhD, CChem, FRSC, FRACI, FACI

Secretary
F.G. Bannon, BCom, FASA, ACIS, LCA

1 Student representative
2 Non-academic staff representative
3 Academic and teaching staff representative
4 Academic Board representative
5 Board of Studies representative
Senior institute staff

Director
W.R. Longworth, MSc, PhD, CChem, FRSC, FRACI, FACE
Assistant Director (Engineering and Applied Science)
R.S. Davie, BE, CEng, FIProD, FIE Aust, MACE
Assistant Director (Art, Arts and Business)
L.M. Jenkins, BCom, DipEd, FASA, MACE
Principal, Swinburne Technical College
A.P. Stark, DIPMechE, TTTC, MIE Aust
Vice-Principal
B.J. MacDonald, BEd, Dip Ed
Dean, Faculty of Applied Science
P.F. Nelson, MSc, DAppSc, FRACI
Dean, Faculty of Art
I. McNeilage, DipArt, TTTC
Dean, Faculty of Business
M.H. Hunter, BCom, MAdmin, Dip Ed, FASA
Dean, Faculty of Engineering
L.M. Gillin, PhD, MEngSc, BMetE, ASMB, FIE Aust, AAIP
Comptroller
F.G. Bannon, BCom, FASA, ACIS, LCA
Registrar
G.L. Williamson, BSc, FRIPA
Services Assistant Registrar
R.T. Dawe, BA, LLB
Administration Officer
L. Scheuch-Evans, BS in Foreign Service
Information Officer
W.D. Barker
Staff Officer
Alison L. Dews, ARMIT
Correspondence Registry
Elizabeth A. Black
Admissions and Examinations Officer
M.J. Foley
Faculty Secretaries
Applied Science
J.S. Ure, BSc, DTA
Arts
Elizabeth A. Williams, BA, DipCrim
Business
Valerie Stiles, BA
Engineering
A.J. Miles, BSC, BEd

Comptroller's office
Comptroller
F.G. Bannon, BCom, FASA, ACIS, LCA
Accountant
D.F. Baker, AASA, ACIS, RCA
Assistant Accountant
R.N. Devers, AASA
Budget Officer
Kirsty Linke, DipCom, AASA
Maintenance Officer
A.J. Kibble, CBUILD, AIB
Manager, College Press
A.D. McNaughton
Planning Officer
T. Rosauer, BArch, FRAIA, RIBA
Project Officer
R.G. Allingham, TTC, DTSC
Paymaster
D.T. Coutts

Registrar's office
Registrar
G.L. Williamson, BSc, FRIPA
Services Assistant Registrar
R.T. Dawe, BA, LLB
Administration Officer
L. Scheuch-Evans, BS in Foreign Service
Information Officer
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Faculty Secretaries
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J.S. Ure, BSc, DTA
Arts
Elizabeth A. Williams, BA, DipCrim
Business
Valerie Stiles, BA
Engineering
A.J. Miles, BSc, BEd

Swinburne Technical College office
Office Manager
D.T. Barnard, DFM, BCom, AASA(Snr), ACIS, RCA
Assistant Accountant
J. Sutton
Assistant Registrar
Geraldine E. Emerson, BJuris, LLB
Membership of Academic Board

As at 31 August 1980

Ex officio

Chairman
Dr W.R. Longworth (Director)

Assistant Directors
Mr R.S. Davie
Mr L.M. Jenkins

Deans
Dr L.M. Gillin
Mr M.H. Hunter
Mr C.K. McDonald
Mr I. McNeilage
Dr P.F. Nelson

Heads of teaching departments
Mr N.J. Allport — Accounting
Mr T. Burke — Social and Political Studies
Mr R.A. Francis — Graphic Design
Mr W.N. Fricker — Mechanical Engineering
Mr A.P. Gardner — Applied Chemistry
Mr M.A. Howe — Psychology
Mr H.J. Kanmegjessier — Humanities
Mr R.P. Kavanagh — Mathematics
Dr P.G. Martin — Computer Studies (Acting)
Mr B.N. Nicholls — Economics
Mr S.J. Rackham — Physics
Mr B.C. Robinson — Film and Television
Mr J.K. Russell — Manufacturing Engineering
Mr A.J. Sampson — Liberal Studies
Mr R.B. Sandie — Civil Engineering
Mr R.W. Treloar — Data Processing and Quantitative Methods
Mr B. Warren — Languages
Mr W.T. White — Administration and Law
Mr N. Zorbas — Electrical Engineering

Comptroller
Mr F.G. Bannon

Registrar
Mr G.L. Williamson

Swinburne Librarian
W. Linklater, BA, DipLib, DipEdTech (CNAA), ALAA

Co-ordinator, Student Health and Welfare
Mary Algar

Head, Education Unit
Mr B. Hawkins

Representative, Technical College
Mr A.P. Stark

Representatives, Board of Studies STC (2)
Mr G.A. Harrison
Mr G.N. Williams

Representatives, College Council
Mr W. J. Braden
Mr R.N. Morse

President, Student Union
Mr M. Marcou

Elected members

Faculty of Applied Science (6)
Mr P.A. Evans
Dr J.M.P. FitzGerald

Mr K. Harris
Mr D. Lamble
Mr R.L. Laslett
Mr C.C. Scott

Faculty of Art (2)
Mr G. Dance
Mr A.M. Evans

Faculty of Arts (4)
Mr P. Fleming
Mr L.A. Kilmartin
Mr D.Y. Mayer
Mr J.P. McLennan

Faculty of Business (5)
Mr D.G. Adams
Mr G.W. Bell
Mr D.V. Hawkins
Mr W.C. Nash
Vacant

Faculty of Engineering (8)
Mr F.H. Allen
Mr I.B. Chapman
Mr R.H. Evans
Dr I.J. Freshwater
Mr B.J. Hird
Mr H. Knol
Mr K.J. McManus
Mr C.F. Tenniswood

General representatives
Mr K.R. Horrigan
Mr W.J.P. Lavery
Mr N.J. Maling
Mr R.C. Tanter

Members in a personal capacity
Dr G.E. Mapstone
Mr P.D. Stewart
Mr R.S. Walker

Student members
Anja I. Areskog
Mr I. Cohen
Mr S.J. Godsau
Mr A.A. Stewart
Mr G.R. Winston


Membership of Board of Studies
As at 31 August 1980
Ex officio
Chairman
Dr W.R. Longworth (Director)
Principal
Mr A.P. Stark
Vice-Principal
Mr B.J. MacDonald
Heads of Division
Mr G.A. Harrison — General Studies
Mr G.A. Martin — Building
Mr M.M. Katz — Engineering
Heads of Teaching Departments
Mr R.M. Carmichael — Humanities (Acting)
Mr T.C. Bell — Building Construction
Mr P.C. Quail — Business Studies
Mr F.L. Smyth — Electrical and Electronics
Mr R. Gullan — Mathematics and Science
Mr E.C. Bird — Plumbing and Mechanical Services
Mr G.N. Williams — Machines and Materials
Office Manager
Mr D.T. Barnard
Swinburne Librarian
W. Linklater, BA, DipLib, DipEdTech(CNAA), ALAA
Representatives, College Council
Hon. Mr W. Jona MP
Fay Moore
Elected members
Staff representatives
Mr F. Hutchison
Mr N.J. McBride
Tertiary representatives
Mr A.P. Gardner
Head, Education Unit
Mr B. Hawkins
Co-ordinator, Student Health and Welfare Unit
Mary Algar
Education Services Co-ordinator
Lynna J. Ausburn

Library
Swinburne Librarian
W. Linklater, BA, DipLib, DipEdTech(CNAA), ALAA
Chief Librarian
Jessie Mcl. Harley
Acquisitions
Merna F. Mattsson, BA, AssocDipLib, ALAA
Chris A. Durward
Meredith R. Barnes, BA, GradDipLib
Audio-visual
Bonna Jones, BSoSci(Lib'ship), ALLA
Marguerite Hawkins
Cataloguing
K.M. Villwock, BA, ALAA
Penny L. Crawn, BA, DipEd
June E. Fizelle, BA(Hons), ALAA
S.K. Hall, FRMIT(ElecEng), GradDipLib, GradDip EDP, ALLA
Christina R. Haskin, BA
Helen L. Pitt, BA, AssocDipLib.
Denise R. Ethell
Periodicals
Kath M. McGrath, BA, GradDipLib, ALAA
J.P. Rogan, BA, GradDipLib, ALAA
Readers' services
P.C. Simmenauer, BA, DipLib, ALAA
Circulation
Barbara J. Irvine, BSoSci (Lib'ship)
Reader education
Bea J. Donkin, DipArts, ALAA
Reference
I.A. Douglas, BA, MSc
Reference and reader education
Jenny A. Loh, BSc, GradDipLib
Pat M. Pettit, BA(Hons), GradDipLib
Barbara A. Camfield, BA, AssocDipLib
Janet M. Lindner, BSocSci(Lib'ship), ALAA
Dianne M. Zakis, AssocDipLib
Karola A. Deefholts, DipLib
Vanessa Seymour

The central reference and lending library is housed in a modern five-storey building with an ultimate capacity for 650 readers and 50 staff. All books, periodicals and other materials in the collection are available for use in the library and most may be borrowed. Copying facilities are available at reasonable cost. The major purpose of the library is to supplement and support formal course instruction and to provide ample opportunity for recreational and general reading.

In 1979, the collection comprised approximately 166,000 items. Over 3,500 current periodicals are received, including a wide range of indexes and abstracts. There is a rapidly growing collection of audio-visual material, including records, audio- and video-tapes, slides and films. Library staff work in close association with teaching staff in developing these resources, and in helping the students by introducing them to a diversified collection of literature and a wide range of media on all types of subjects. Formal and informal instruction is given to
students on the use of catalogues, reference works and bibliographical aids both in direct connection with their courses, and also in relating their specialist courses to society as a whole. Reciprocal borrowing facilities at other tertiary educational institutions have been arranged to increase the resources available to students and staff.

Rules and procedures

Persons entitled to use the library

The library at Swinburne is available for the use of all full-time and part-time students and staff of the institute and the college, who accept the following rules and procedures officially decided and agreed upon by the Library Committee, the Academic Board, and the Board of Studies.

In addition, any professional people from commerce, industry and the public services in the region of Swinburne, and members of the general public are welcome to read or use audio-visual facilities within the library, provided that they, too, accept the rules. In general they are not entitled to borrow from the library. The Swinburne Librarian, Chief Librarian, or the senior staff member on the premises may refuse entry to the library to any person not registered as an approved borrower.

Persons entitled to borrow from the library

Members of the Swinburne Council.

Full-time and part-time staff members of the institute and the college.

Full-time and part-time students of the institute and the college.

Such other persons or organisations as the Swinburne Librarian may from time to time approve as borrowers.

Hours of opening

Normal hours of opening for the library during semesters, including the semester break, are:

- Monday to Thursday inclusive: 8.45am to 10.00pm
- Friday: 8.45am to 8.30pm

Public holidays

- Queen’s Birthday: 8.45am to 10.00pm
- Show Day: 2.00pm to 10.00pm
- Cup Day: 8.45am to 10.00pm

Closed on all other public holidays.

During vacations

Mid-semester breaks:

- Monday to Thursday: 2.00pm to 10.00pm
- Friday: 2.00pm to 8.30pm

Long vacation

- Monday to Friday: 9.00am to 5.00pm
- Closed between Christmas and New Year.

Saturday 10.00am to 5.00pm

Depending on demand, from early in each semester, up to and including the Saturday at the end of the first week of examinations.

Library loans to students

Loans to students are available only on acceptance of the following conditions:

General

All materials borrowed must be recorded at the loan, reserve, periodical or audio-visual counters and must be returned by the date and time indicated. Items borrowed, with the exception of audio-visual and periodical material, should normally be returned through the chutes located outside the main entrance.

Borrowing periods

Fortnightly loans

The normal loan period for most books and pamphlets is a fortnight. This period may be extended for a further fortnight provided the item has not been reserved and it is not overdue.

3 day loans

Available for material on the shelves which is in moderately heavy demand, and is marked ‘3-day loan’.

This material may be borrowed at any time of the day, but may not be renewed.

Overnight loans

Available for: unbound periodicals including annuals and irregular publications, but excluding display issues. Some of the items in the Counter Reserve collection and any other items marked ‘overnight loan only’.

This material may be borrowed after 4.00pm from Counter Reserve and should be returned by 9.00am the next week-day. This condition may be varied for part-time students.

Weekly loans

Audio-visual material (excluding microforms, video-cassettes and slides) and equipment which is not marked ‘not for loan’ may be borrowed for weekly loan.

Counter reserve collection

Material in this collection may be borrowed for a period of two hours for use in the library, except as specified above, and will be issued in exchange for a current Swinburne identity card, which is held until the item is returned.

See the Guide to the Library for further details.

Items not available

Items not available for loan outside the library include:

- Material in the Reference collection (distinguished by the prefix ‘R’ in the call number), Rare books (‘V’), Archives (‘AR’), Vertical file material, microforms and those materials marked ‘not for loan’ or ‘display’.

- Bound periodicals, newspapers and government publications from the deposit collection may not be borrowed.

- Reservations for all material on loan may be made at the reservations sections of the loans counter, and for material located in Stack, at the Enquiries Desk.

Fines

Loans are issued subject to the imposition of penalties for late return as below. Fines will not increase once the item has been returned, but all penalties shall continue to apply until the fine has been paid.

Fortnightly loans and audio-visual loans — per item

- $0.50 per day or part thereof overdue, to a maximum of $5.00, suspension of borrowing privileges and withholding of examination results.

3-day loans — per item

- $1.25 per day or part thereof overdue to a maximum of...
$5.00 per item, suspension of borrowing privileges and withholding of examination results.

**Overnight loans — per item**
First day: $0.50 per hour late. For each day thereafter: a further $2.00 to a maximum of $5.00, suspension of borrowing privileges and withholding of examination results.

**Counter Reserve loans (within the library building) per item**
$0.50 per hour late, to a maximum of $5.00, suspension of borrowing privileges and withholding of examination results.

**Lost library material**
If an item is lost, the loss must be reported immediately to the Readers’ Services Librarian. If after a reasonable search has been made, the item cannot be found, the borrower shall be responsible for the replacement cost plus a processing charge.

**Identity cards**
Loss of an identity card must be reported immediately to the Readers’ Services Secretary, Level 2, Library otherwise the library can take no responsibility for items borrowed on that card. These are not transferable and are valid only when signed. A current card must be produced when borrowing or photocopying otherwise service may be refused. Lost or damaged cards may be replaced by the Library at a cost of $1.00.

**Rules for general conduct**
Eating is not allowed in areas of the library open to the public.
Drinking, except from the drinking fountains, or in the immediate vicinity of the drink vending machines, is not allowed in areas of the library open to the public.
Playing games in the library is not allowed.
Smoking is permitted only in the stair lobbies, level 2 and in those areas clearly marked by notices.
Cigarettes must not be placed anywhere except in the ashtrays provided.
Bags and cases may be brought into the library, but must be offered for inspection on leaving.
An atmosphere of quiet must be maintained in the library so that it is at all times a place conducive to independent study and quiet reading. Silence must be kept in the areas indicated and conversation restricted to the areas set aside for this purpose.
Any person who, in the opinion of a member of the library staff and the senior staff member on the premises, repeatedly fails to observe the above rules, or who disfigures or damages a book, periodical or any other library resource or fitting in any way, may be excluded from the library for the rest of the day, and shall be responsible for all damage caused.
Persistent or serious offenders may be reported by the Swinburne Librarian to the Swinburne Registrar for disciplinary action which may include suspension of borrowing privileges, exclusion from the library, and withholding of examination results.

**Power to alter rules**
One or more of the rules for general conduct may be changed from time to time by the Director on the recommendation of the Swinburne Librarian.
At the discretion of the Swinburne Librarian one or more of the rules may, under special circumstances, be temporarily suspended. Each suspension shall be reported at the earliest opportunity to the Director and to the Library Committee.

**Photocopying**
Photocopying machines available to staff and students are located on level one of the library building. Because of copyright provisions, no person other than enrolled students or members of staff of the institute or the college, or special borrowers approved by the Swinburne Librarian, may use the photo-copiers. Users must, on each separate occasion, sign a declaration that the copies which they are about to make are permissible under the terms of the Copyright Act.
Institute services
Student Health and Welfare Unit

Unit staff
Co-ordinator
Mary Algar, BA(Hons Psych), DipSocStud, MAPsS

Counselling
Mary Algar, BA(Hons Psych), DipSocStud, MAPsS
Monica Manton, BA(Hons Psych), MAPsS
Kristina Olsen, BA, DipSocStud
Margaret Rae

Careers information
To be appointed

Employment and housing
M.J. Keaney, BComm, GDipRec
Jenny Ralph

Health
Dr Jean McLeod, MB, BS
Janet Fischer, SRN, SRM
Diana Mollison, SRN

Chaplaincy
Rev. H. Kerr, BA, DPS
Rev. Fr B. Caulfield-James, SJ, BA, BEd
M. Adler

Student health and welfare services
The following services are available to all students:
Counselling
Health
Employment
Housing
Careers library
Chaplaincy

These services are administratively co-ordinated into the Student Health and Welfare Unit. Although the chaplains are not formally a part of the unit, they work in close association with it.

Student counselling service
Location: room 206, level 2, BA building
Telephone: 819 8025

The counselling service is available to students, staff, prospective students, parents and partners of students. The service is free, voluntary and strictly confidential. Counselling is concerned with helping people, individually and in groups, with personal problems, vocational and career decisions and planning, financial concerns and study problems.

Some areas of student concern are: loneliness, adjustment to life at Swinburne, subject choice, deferment, choosing a course, examination anxiety, exclusion, vocational decisions, studying part-time, leave of absence, academic difficulties, concern about others, study problems, marital and pre-marital counselling, relationships, sexuality, family, financial problems, career planning, scholarships.

The student counselling service is open from 9.00am to 5.00pm throughout the year and remains open for part-time students on Monday evenings until 6.30pm or at other times by appointment.

Student health service
Location: room 207, level 2, BA building
Telephone: 819 8483.

The student health service is available to all students and to staff for emergency treatment.

The object of the health service is to provide treatment in the case of accidents, sudden and short-term illnesses, medical counselling, a health education program and referral to appropriate sources where necessary.

The student health service is open from 9.00am to 5.00pm; the doctor is available by appointment three hours daily.

Student housing service
Location: top floor, Ethel Swinburne Centre (above the Cafeteria)
Telephone: 819 8541

The student housing service provides addresses of a wide range of accommodation including full board, single rooms, houses and flats, and hostels. Many students also use the service to find other students to share accommodation. Advice on living away from home and the legal and financial problems associated with renting is also available to all Swinburne students.

The office is open from 9.00am to 5.00pm Monday to Friday, and remains open until 6.00pm by appointment for the convenience of part-time students.

Student employment service
Location: top floor, Ethel Swinburne centre (above the Cafeteria)
Telephone: 819 8445

Assistance is provided for students seeking:
Vacation employment
Part-time and casual work
Full-time employment

Several services are available, including:
- an employment register and placement service for students seeking full-time employment and details of major recruiting campaigns;
- a campus interview program where a range of employers visit campus to interview final year diploma and degree students;
- an employment resources library including details of employment prospects and career opportunities with private and public employers;
- assistance with job application and interview techniques, individually or in group workshops;
- personal guidance and support for students in their search for appropriate employment.

The office is open from 9.00am to 5.00pm Monday to Friday, and remains open until 6.00pm by appointment for the convenience of part-time students.
Institute chaplains
Location: room 206a, level 2, BA building
Telephones: 819 8489, 819 3699, 541 3162
The chaplains are not employed by the institute but have a wide responsibility to everyone at Swinburne regardless of religious affiliation or lack of it.
They are available for confidential counselling but most of their work is done through informal contact with students and staff.
They are involved in the community life of the institute and take part in student activities, giving help and support or advice if needed. They also organise discussions and camps.
Students and staff are invited to drop in at any time.
New students, in particular, are invited to come and introduce themselves.

Careers library
Location: within student counselling service, room 206, level 2, BA building
Telephone: 819 8025
To assist students in their choice of careers and courses, the Careers and Information Officer maintains a comprehensive library of information on a wide range of courses at Swinburne and elsewhere: apprenticeships, evening classes, middle-level courses in technical colleges, tertiary and postgraduate courses.
The library is for the use of all Swinburne students and staff, prospective students and schools within the area.
The student employment office provides more specific information on employers and employment opportunities.

Disabled students
Students or staff who are permanently or temporarily handicapped in any way and have difficulty with access to teaching buildings, the library, use of lifts, telephones, cafeteria, etc., should contact Margaret Rae in the student counselling service, level 2, BA building, or telephone 819 8025.

Living allowances
Information regarding a number of living allowance schemes and scholarships is available from the student counselling service. Application forms are also available.
With the approval of the Loan Fund Committee, long-term and short-term financial assistance can be obtained from the following loan funds:
- Commonwealth Help for Needy Students Loan Fund
- Swinburne Council Fund for Tertiary Orientation
- Program Students
- Student Aid Fund
- Student Union Short Term Aid Fund
- Gary Clegg Memorial Fund
Enquiries should be made to the student counselling service. Telephone 819 8025.

Tertiary Education Assistance Scheme (TEAS)
The Commonwealth Government provides financial assistance for full-time study. This includes courses at technician, certificate, diploma, degree and postgraduate diploma level. To be eligible, students must also meet certain requirements regarding previous study, other awards held, etc.
As from 1 January 1981 the following benefits are available subject to a means test:
- **Maximum living allowance**
  - for dependent students at home: $1,675 p.a.
  - for dependent students away from home: $2,583 p.a.
  - for independent students: $2,583 p.a.
- **Incidentals allowance**
  - for dependent spouse: $2,220 p.a.
  - for dependent child: $520 p.a.
Applications may be made after enrolment in a course. Pamphlets and application forms available from student counselling service or the Commonwealth Department of Education, 450 St. Kilda Road.

Adult Secondary Education Assistance Scheme (ASEAS)
This Commonwealth scheme provides assistance to students aged 19 years or over at 1 January 1981 in the Tertiary Orientation Program, who have not completed Year 12 in the past three years, subject to a means test and certain conditions of eligibility.
Benefits are similar to the TEAS scheme.
Further details and application forms are available from the student counselling service.

Secondary Allowance Scheme (SAS)
This scheme provides assistance to families of Tertiary Orientation Program students under 19, with a limited income. An allowance of up to $660 p.a. will be paid, subject to a means test.
Details may be obtained from the student counselling service.
Assistance for isolated children
Students likely to qualify for this assistance are those who do not have reasonable daily access to an appropriate government school. This includes Tertiary Orientation Program students who must live away from home when the family moves away during a school year, those who must live away from home to undertake a remedial or other special type of course, those who live in a geographically isolated area and those who are handicapped.
Benefits include a boarding allowance, a second home allowance and a correspondence allowance. Details may be obtained from the student counselling service.

Aboriginal Grants Schemes
These schemes provide assistance to secondary and post-secondary students of Aboriginal or Torres Strait Island descent.
Details are available from the student counselling service or the Commonwealth Department of Education, 450 St. Kilda Road, Melbourne, 3000.

National Employment and Training System (NEAT)
Under this scheme, the Commonwealth government retrains people who do not have employable skills. This is done by providing on-the-job training or by providing financial assistance for part-time or full-time studies. The courses of study approved are dependent upon labour market shortages. Details are available from local Commonwealth Employment Service officers.

Postgraduate awards
The Commonwealth Department of Education provides the following awards for postgraduate study:
- TEAS (for postgraduate diploma courses. See information on TEAS in this handbook)
- Postgraduate awards at the colleges of advanced education
- Postgraduate course awards (at Universities)
- Postgraduate research awards
Selection for these awards is based on academic merit. Applications should be made to the Registrar of the college/university where you wish to undertake study, in September of the preceding year.
There are a number of other postgraduate awards available, both locally and overseas. Information about these may also be obtained from the student counselling service.

Scholarships, prizes and awards
Some of these are general awards and others are available only to Swinburne students. Details may be obtained from the student counselling service and teaching departments.

USP Needham Scholarship
Awarded to an outstanding student proceeding to the second year of the diploma of art, film and television course. Value: $150.

The Margery Withers and Richard McCann scholarship
Available for the second year of the diploma of art, graphic design course. Value: $100.

FCB/SPASM scholarship
Two scholarships are available for the third year of the diploma of art, film and television course. Value: $250 each.

Society of Chemical Industry of Victoria prize
A certificate and a prize of $25 is awarded to the student nominated by the department as the best student in the final year of the diploma course in chemical engineering.

F.W. Green Prize
Books to the value of $50 are awarded by the Engineering Faculty Board to the most outstanding engineering student graduating that year.

Molyneux medal
A silver medal and a prize of $30 are awarded to the student in the final year of the diploma of chemical engineering who presents the best process design thesis.

The A.F.E. Tylee, the J. Smith Memorial and the K. Kennewell Memorial prizes
These are awarded in the fields of social science, chemistry, mathematics and civil engineering.

Walter Lindrum Memorial Scholarship
This is available to a student who is qualified to enter the first year of a diploma course. Value: $350 p.a. Applications close at the end of October.

Aluminium Development Council scholarships
This is an unbonded award available to engineering students in their third, and in some cases, second and fourth years. Value: $600. Applications close in December.

Dafydd Lewis Trust Scholarship
This is available to male students who will be proceeding with degree level study in 1980; this is subject to a means test and certain conditions of eligibility. Value: $40 to $56 p.w. Applications close at the end of November.

Gowrie Scholarship
This is available to the children, grandchildren, step-children or adopted children of ex-service personnel who served in combat areas during 1939-1945, and in secondary or post-secondary institutions. Value: $150 p.a. Applications close in September.
Alexander Rushall Memorial Scholarship
This is available to Protestant male students in the Tertiary Orientation Program and in the Technical College. There is a means test. Value $40 to $200 and is tenable for one year. Applications close in December.

The Institution of Engineers, Australia Award
This is awarded by the Institution of Engineers to the best all-round student in the final year of an engineering course. The award comprises the W.P. Brown Medal and a prize of $100.

Business prizes
There are a number of prizes offered in the Faculty of Business which are presented by professional societies and business organisations. For details, see Faculty of Business handbook.

Central Technical Workshops
The technical workshop manufactures teaching aids and prepares experimental work for staff and students (in consultation with lecturers).
Equipment available includes lathes, milling machines, sheet metal, welding facilities including aluminium and stainless steel.
The instrument workshop effects repairs and maintenance to college instrumentation in the electronic, mechanical, electrical, and to a minor degree, optical fields. Some manufacturing for student projects, in consultation with lecturers, is also undertaken.
Manager: Mr Guy Nettleship, CEng, MIMarE, 819 8326.

Centre for Urban Studies
The Centre for Urban Studies was established at Swinburne in 1973. The management committee is composed of members of staff from several departments and the Centre promotes and co-ordinates urban studies courses at graduate and undergraduate level; develops extension lectures, seminars and community education programs and publishes papers and teaching materials about urban problems, for distribution to the community.
The centre, which has its headquarters in the administration building, was awarded the 1978 Certificate of Planning Achievement by the Town and Country Planning Association. Some of the successful fields of investigation have been in the areas of:
urban design
environmental impact statements
urban renewal
watercourse management
housing policy
Further details on the Centre’s activities are available from The Secretary, Centre for Urban Studies, 819 8825.

Child-care Centre
A co-operative was formed in 1975 to provide child care facilities at Swinburne for parents in need of this service.
The primary objective of our centre is to meet the needs of the children by providing a secure and happy atmosphere combined with experiences which will foster their development. The aims of our centre do not revolve around giving parents free time to pursue their own interests or serving manpower requirements but rather encouraging a beneficial contact that will produce an understanding of the needs of the individual child and their family.
In our two houses we have up to thirty children at one time with six caring staff. The children are not separated into age groups but form one large, if rather noisy, family. Some of our time is structured, for the older children, but the rest is spent in an open-learning environment where the children engage in free-choice experiences. Each child is encouraged to go at their own pace and to develop their own style, to find their own solutions and enjoy their own creativity.
The centre caters for children up to five years of age from not only the institute but the community. A sliding scale of fees is in existence.
Interested persons are advised to contact Sheralyn Chambers or Mary D’Souza on 819 8519.
College Press
The publications department was established in 1952 with a staff of three and one duplicating machine. Over the years the department has developed into the Swinburne College Press with a staff of 12 and a full offset printing capacity.

The Press is primarily designed to give a fast print service geared to meet requirements for the production of class notes, student material and various types of administrative stationery. The major requirement is for single colour work but in addition the press has a limited line colour production capacity. In support of its printing element the Press operates a small bindery to collate, staple and trim publications and a typesetting service with a range of IBM Selectric Composer faces.

The Swinburne College Press is registered under the Business Names Act and is a recognised printing and publishing house.

Manager: Mr David McNaughton, 819 8123.

Computer Centre
Manager:
Mr M. Plunkett, BEdc, MACS
Secretary
W. Anne Frazer
Data Base Administrator
Mr P. Hill, BAppSc(EDP)
Systems Programmer
Mr R. Schorer BSc(Hons)
Programmers
Mr N. Kasperovic
Mr P. Lynch
Mr J. Grey
Mr R. Gruchy
Mr A. Wilson

Computer Operations
Krystina Adamczyk
Heather L. Hall
Sarah Salem
Lyn A. McGie
Rosemary Close
Mr M. Avellino
I/O Centre
Julie Bradford
Sue L. Milne

The Swinburne Computer Centre provides computing and data processing facilities for all the teaching, research and administrative applications. In 1981, three processors will be available to handle the total workload.

All machines are located in the McPherson Engineering Building. The main computer room, H110, houses the FACOM M160F and the PDP-11/40 configurations. The M160F, installed in 1980 is configured with 200 mega-bytes of disc storage, 2 communications processors, a printer, card reader and 2 tape drives. Actual memory of the central processor is 6 mega-bytes. The system supports an extensive terminal network with VDU’s and hard copy devices distributed through the Arts, Business, Applied Science and Engineering faculties. Batch or interactive access to a large range of programming languages (including BASIC, FORTRAN, COBOL, RPG, LISP, APL and PASCAL) and software packages (including SPSS, SAS, INSL, SIBYL/RUNNER, NAG, ESP, CUSC, SSLII, FNAP and RELCODE) is provided. Software relating to Graphics, General Ledger, Financial Modelling and Data Base is used in several courses.

The PDP-11/40, which has extensive disc space and a network of some 24 terminals and dial-up facilities, is primarily devoted to computer-aided instruction.

The third machine is an EAI Pacer 500 which is a hybrid machine, that is, it is both a digital and an analogue computer. Among other features the Pacer 500 has facilities for performing terminal graphics operations.

The Computer Centre is also responsible for the development, maintenance and production of a number of systems used by the administration sector of the institute. The major applications are Student Records and the Library Circulation and Cataloguing systems.

Basic maintenance of the institute’s terminal network is also administered by staff of the Computer Centre.

Most of a student’s computing requirements can be satisfied by using a terminal connected to either the Facom, PDP or Hybrid systems and the different teaching departments maintain their own internal booking procedures to allow access to those terminals. However those users whose work is done in batch mode (ie. involving card input and hard copy output) submit their jobs to the I/O Centre in room H208 and later collect output from there. Similarly any listings initiated by terminal users, which are produced centrally can be collected from H208. The I/O Centre is open during semesters from:

9.00am to 7.30pm Monday, Tuesday and Wednesday and
9.00am to 5.00pm Thursday and Friday

Assistance to students is provided through a duty programmer service for those problems that cannot be solved by the teaching staff. In addition, the Centre conducts seminars specifically designed to ensure that teaching staff and students use the computing facilities in an efficient and co-ordinated manner. The Centre’s main publication is a User’s Guide, which is supplemented throughout the year by a number of bulletins.

Education Unit
The function of the education unit is to assist the teaching/learning departments throughout the institute by keeping them informed of developments in education and related disciplines through seminars, workshops and a newsletter; by working with staff who are developing and introducing new methods and courses; by channelling funds to staff who need to be relieved, temporarily, of teaching duties or who require special equipment or other arrangements in order to introduce new methods of technology; and by providing facilities for research into specific educational topics.

Audio-visual services
Located in room BA309 of the Business and Arts Building, the audio-visual services are available for use by all full-time and part-time staff and students of both divisions.
Before planning the use of the services, students should consult with their lecturer or instructor and obtain agreement on the planned assignment and bring the signed agreement to audio-visual services. The services offered include the locating, booking and screening of educational films, audio- and video-recording, including micro-teaching, 35mm slide and overhead projector transparency making, general photographic assignments, high speed audio-duplicating, sound studio production and editing.

Intending users of audio- and video-studio recording facilities are advised to consult with the staff of audio-visual services well in advance of the recording date. Also available is the short-term loan of slide projectors, opaque projectors, audio- and video-tape recorders and other audio-visual equipment.

**Head, Education Unit**
Mr Bernard Hawkins, BA, MEd, DipEd, MACE, 819 8384.

**Education Officer** (educational technology) Mr Keith Anderson, MA, BSc, DipEE, MIEAust, MACE, TTTT, 819 8384.

**Education Services Co-ordinator**
Lynna Ausburn, PhD, MA, BSc, SecTeachCert, MACE, AECT, 819 8355.

**Audio-visual**
**General enquiries:** 819 8031  
**Officer-in-charge:** David McAdam, BA, 819 8010

**Information office**
The Information office is responsible for all aspects of public relations activities, including internal and external communications, visitors' days, visits to the institute by schools and other groups, media liaison and advertising.

**Information Officer:** Mr W.D. Barker, 819 8460  
**General Enquiries:** 819 8444.

**Parking**
Limited car parking facilities are provided for all part-time and full-time students. No charge is made, but a 1981 car park sticker must be clearly displayed on the car. The stickers are available at the Student Union office.

Evening students may not leave cars in car parks belonging to the institute while they attend work during the day, except with a special permit obtainable from the Student Union.

Convenient parking is provided for motorcycles and bicycles, the latter under cover.

On-campus parking areas are indicated on the map inside the front cover of this handbook. Additional parking areas which can be used are located immediately west of the Hawthorn Football Ground, accessible from Linda Crescent.

**Science Education Centre**
The Applied Science Faculty at Swinburne has a centre which carries out the following functions:
- Offers technical information to secondary school staff.
- Provides the opportunity for secondary students to carry out experimental work at Swinburne, using equipment not readily available in schools.
- Operates the Travelling Science and Technology Show which is designed to stimulate interest in science.
- Provides a meeting place for the exchange of ideas between teachers.

**Chairman of committee**
Dr P.F. Nelson, Dean, Faculty of Applied Science  
For further information please ring 819 8503.

**Swinburne Applied Behavioural Studies Centre**
Established in 1977, the Swinburne Applied Behavioural Studies Centre is an interdisciplinary group with its administration based in the Department of Psychology, Faculty of Arts. The centre acts as a focus for organisations and people seeking psychological and behavioural services, such as research, consulting and training of staff in appropriate areas. From time to time workshops are held dealing with topics such as survey research interviewing and interpersonal skills training.

**Chairman:** Mr Maurie Howe, Head, Department of Psychology, 819 8203.

**Swinburne Applied Research and Development Division (SARDD)**
Swinburne was the first college of advanced education in Victoria to appoint an industrial liaison officer to establish closer working relationships with industry, enabling applied research and investigation to be carried out for a wide cross-section of industry and commerce. Industrial liaison centres operate at many tertiary colleges overseas.

SARDD covers consultation, technical information services, testing and research in addition to design and development of special projects.

**Executive Officer:** Mr Frank Lees, BMechE, 819 8001.

**Swinburne Student Bookshop Co-operative Limited**
This bookshop has been established for the benefit of all students and staff. The aim is to maintain a high standard of service together with a low as practicable price structure on all books, stationery, calculators and other items sold.

The shop is situated in the Student Union Buildings, John Street. Entrances are from John Street and from the cafeteria quadrangle.

To be eligible for discount benefits, students must buy one dollar share from the Co-operative to become a registered shareholder.

All students are advised to join the Co-operative to ensure that the Student Bookshop can continue to provide cheaper books and articles for student use.

**Manager:** Rolf Wilkens, 819 8225
Student activities

Student Union
The student union, as the name suggests, is a union of students who attend Swinburne. It has many responsibilities:

1. Implementing policy decided on by a general meeting of the students.
2. Providing varied services to students.
3. Protecting and maintaining the rights of students.
4. Representing students on college committees.
5. Raising political issues on campus.

There are many other duties for which the student union is responsible, many of which are flexible and arise as needs demand.

All students have the same rights in respect to the union and all are entitled to use the services provided by it. Some of these are:

Clubs and societies
Many clubs and societies are in operation providing a wide range of activities for students. Clubs active in 1980 included:
- Photographic Society
- Explorers Club
- Swinburne League of Business Studies (SLOBS)
- Overseas Students Service (OSS)
- Psychology Society
- Italian Club
- Folk and Blues Club
- Jewish Students Society
- Environmental Health Society
- Chemical Engineering Society
- Arts Students Society

Any group of students may establish a club or society to further their group’s aims and may apply for affiliation with and financial support from the union.

Orientation
Orientation is held in the first week when classes begin. All students will find it helpful to enter into the activities associated with orientation as it will familiarise them with the various aspects of the institute that they may otherwise take months to find out about. Information about orientation is available on your first day at Swinburne.

Radio station
3SW provides music and information every day for students in the cafeteria and lounge. Students are involved in the running, organisation, announcing and content of the programs. Anyone interested in becoming involved at any of these levels should contact the radio coordinator at 3SW in the Union Building. Production facilities for special programs and recording are available.

This is a valuable media which is part of the student radio network consisting of many Melbourne campuses and all students have access to it.

Student publications
A twice-weekly broadsheet, Scraglet, is provided by the student union. This publication provides information about on-campus student activities and other matters of particular interest to students as well as free advertising. It also provides a forum for students to present and argue their views on all matters.

Scrag is the monthly newspaper of Swinburne students. Scrag is published in the first week of every month, and carries articles on various subjects which probably won’t be found in the monopoly media. It is a vocal newspaper analysing social issues pertaining to students and the wider community of which they are part.

The orientation handbook is compiled every year for new students, providing them with the basic information necessary to make the most of their stay at Swinburne. Information on student facilities, the various sporting clubs and societies, and other general information is provided.

Union shop
The union shop provides a range of articles at cut prices including cigarettes, confectionery, hot and cold drinks, hot take-away food and chemist’s items.

Contact centre
The contact centre is an information and referral service staffed by students for students.

Legal advice
The student union also provides a free legal aid service for students, where information about the law and legal advice can be sought.

Education Research Officer
The Education Research Officer provides a liaison between students and staff on education matters ranging from course content and assessment to time-tables and work load pressures. In particular, the Education Research Officer is appointed to ensure that students have an avenue for complaints which can be acted upon.
Sports Association

At Swinburne there is a very active Sports Association which promotes and encourages a wide variety of sporting and recreational activities. The Association is run by students and has over 20 affiliated clubs. The Association’s Office is housed in the Sports Centre which has two squash courts, a very well equipped weight-training gym and table-tennis facilities. The aim of the Association is to introduce students and staff to recreational sports such as SCUBA diving, sky diving and water skiing, and at the same time continue to develop the interest of students in the more traditional sports of football, soccer, tennis, etc.

The Association competes in an intercollege competition between other Victorian colleges and on a national level it is affiliated with the Australian Colleges of Advanced Education Sports Association, which conducts interstate sporting carnivals. The sports involved in these competitions are athletics, badminton, basketball, football, hockey, netball, rowing, soccer, squash, swimming, table-tennis, Tae Kwon Do, tennis and volleyball.

In addition to the above sports, there are several other clubs which arrange activities, trips and competitions.

These include the following:

Car
Regular car rallies, motorkhanas, hill-climbs, sprints, films and social evenings.

Cricket
Regular interfaculty and student/staff matches.

Gymnasium
A new weight-training gymnasium which is well equipped, catering for both men and women; regular classes will be held.

Field and game
Regular hunting trips and indoor and clay target shooting.

Judo
Classes weekly with qualified instructor.

Modern movement
Classes weekly for both men and women.

Moo Duk Kwan
Another martial art activity, classes weekly with qualified instructor.

Motorcycle
Regular club rides, competitions plus use of club room and tools.

SCUBA diving
Classes for beginners and regular dives. Equipment available for hire.

Sky diving
Classes for beginners and regular weekend jumps, equipment available.

Snow skiing
Midweek and weekend trips to Hotham, Buller and Falls Creek during the midyear break. Weekend trips during second semester. Ski hire arranged by the club.

Surfing
Regular trips both local and interstate, equipment available.

Water skiing
The club has its own boat and equipment and goes on numerous trips during holidays and weekends.

The Sports Association

In addition to the above, the Sports Association subsidises ten pin bowling, golf and ice-skating at local commercial enterprises. It also operates a sports store which sells a complete range of sporting goods at discount prices.

The Sports Association Office and sports store are located in the Sports Centre off John Street, north of the railway line, telephone 819 8018.
Courses offered

Undergraduate

Degrees
Courses leading to degree qualifications are offered in a wide range of fields. The degrees and specialist areas in which Swinburne students may graduate are:

Bachelor of Applied Science (BAppSc)
Applied Chemistry
Biochemistry
Biophysics
Computer Science
Instrumental Science
Mathematics
Bachelor of Arts (BA)
Graphic Design
Italian and other major studies
Japanese and other major studies
Media Studies and other major studies
Political Studies and other major studies
Psychology and other major studies
Sociology and other major studies
Bachelor of Business (BBus)
Accounting
Applied Economics
Data Processing
Bachelor of Engineering (BEng)
Civil Engineering
Electrical Engineering
Mechanical Engineering
Manufacturing Engineering

Diplomas
Courses leading to diploma qualifications of Swinburne College of Technology are available in the following areas:

Diploma of Applied Science (DipAppSc)
Applied Chemistry
Biochemistry
Environmental Health
Diploma of Art (DipArt)
Film and Television
Graphic Design
Diploma of Arts (DipArts)
Italian and other studies
Japanese and other studies
Media Studies and other studies
Political Studies and other studies
Psychology and other studies
Sociology and other studies
Diploma of Business (DipBus)
Accounting

Associate diplomas
Two courses leading to an associate diploma qualification are offered. Other courses are under consideration.

Associate Diploma in Private Secretarial Practice (AssocDipPSP) and Associate Diploma in Production Engineering (AssocDipProdEng)

Postgraduate

Master’s degree
Programs (by research and thesis) leading to the degree of Master can be undertaken in a number of areas:

Master of Applied Science (MAppSc)
Applied Chemistry
Biochemistry
Biophysics
Computer Science
Instrumental Science
Mathematics
Master of Arts (MA)
Graphic Design
Humanities
Languages
Social Sciences
Master of Business (MBus)
Accounting
Data Processing
Quantitative/Economics
Master of Engineering (MEng)
Civil Engineering
Electrical Engineering
Mechanical Engineering
Production Engineering

Graduate diplomas
The institute offers courses leading to the following graduate diploma awards:

Accounting, GradDipAcc
Air-conditioning, GradDipEng
Applied Colloid Science, GradDipAppSc
Applied Film and Television, GradDipArt (AppFilm&TV)
Biocatalytic Engineering, GradDipEng
Biomedical Instrumentation, GradDipAppSc
Business Administration, GradDipBusAdmin
Chemical Engineering, GradDipEng
Civil Engineering, GradDipEng
Civil Engineering Construction, GradDipEng
Computer Simulation, GradDipAppSc
*Corporate Finance, GradDipCorpFin
Digital Electronics, GradDipEng
Energy Systems, GradDipEng
Industrial Management, GradDipEng
Industrial Microbiology, GradDipAppSc
Maintenance Engineering, GradDipEng
Management Systems, GradDipMgtSysts
Manufacturing Technology, GradDipEng
Organisation Behaviour, GradDipOrgBeh
Scientific Instrumentation, GradDipAppSc
Transportation Systems, GradDipEng
Urban Sociology, GradDipArts (UrbSoc)
Urban Systems, GradDipEng

*Awaiting approval
Entrance requirements and application procedure

Undergraduate

Entrance requirements

1. The criteria for entry to a tertiary course at Swinburne Institute of Technology are and always have been, the ability of the student to undertake the chosen course.

2. The institute is committed to flexibility in entry requirements and opposition to any lowering of standards for entry to its tertiary courses.

3. The institute recognises VISE Group 1 subjects. In general, recent school leavers should have achieved Grade D or higher in four Group 1 subjects including English in one year. A ‘score’ will be computed from the standardised marks obtained in those subjects, as one factor in selection.

4. The institute has not yet recognised any VISE Group 2 subjects and is awaiting more details of the subjects proposed for that group before determining whether they are appropriate for admission purposes.

5. The institute recognises Tertiary Orientation Program subjects and will continue to admit students who have completed satisfactorily an accredited Tertiary Orientation Program.

6. The institute recognises Year 12 subjects taken in other states where these subjects are recognised by universities, colleges of advanced education or equivalent institutions in those states.

7. A special entry scheme for mature-age applicants exists for people who may not have the usual secondary school qualifications. This is subject to quota restrictions and to the result of an individual assessment of the applicant’s abilities, motivation and potential.

8. The institute does not specify prerequisite (mandatory) subjects for entry to its courses, however, for the guidance of potential students, some faculties list ‘recommended’ subjects.

Application procedure

Full-time

First year

Applications for entry to full-time study at the first-year level, except for the special provisions noted below, must be made through the Victorian Universities Admissions Committee (VUAC), 11 Queens Road, Melbourne, 3004.

Special provisions

Swinburne Technical College students Tertiary Orientation Program

Students who undertook the Tertiary Orientation Program at Swinburne Technical College in 1980; who completed their year eleven studies at an eastern metropolitan region technical school in 1979 and who intend to apply only for a course of study at Swinburne Institute of Technology, should apply directly to the faculty concerned. Students in this category who intend to apply for courses other than or in addition to those offered at Swinburne Institute of Technology, must apply through VUAC.

Tertiary Orientation Program students other than those in the category mentioned above should consult the Head of the Division of General Studies, Swinburne Technical College, with regard to application procedure.

Mature-age entry

Applications for all courses except Arts must be made to the Registrar on the institute application form. Applications for entry to courses offered by the Arts Faculty must be made through VUAC.

Second year and higher

Applications should be made directly to the institute and not through VUAC. Forms can be obtained from the Admissions Officer, 819 8386.

Closing dates for full-time places in second and higher years are:

- Art: 21 November 1980
- Arts*: 28 November 1980
- Engineering*: 16 January 1981

*Further applications will be received after this date if places are available.

Part-time

Part-time courses are offered in all faculties except Art.
All applications for part-time courses must be made directly to the institute. Forms are obtainable from the Admissions Officer, 819 8386.

Closing dates for part-time places should be received by:

- Arts: 28 November 1980*
- Engineering: 16 January 1981

*Further applications will be received after this date if places are available.

The special provisions for mature-age entry set out above apply for entry to first year part-time courses. Applications under the provisions for part-time places should all be forwarded to the Admissions Officer by the dates stipulated.

Deferred entry

Students who are offered a place in first year for 1981 may apply for deferment until 1982. Applications must be addressed to the Registrar, and must be made at the time an offer is received.

Deferment of up to one year will be virtually automatic for those students who apply as soon as they receive an offer. Students who have been granted deferment will be informed in writing by the faculty concerned.

Deferments will be valid for one year only, for entry to the particular course for which the original offer was made.

If a student who has been granted a deferment applies to another faculty or to another college or university, the offer of a reserved place will lapse.

Overseas students

Approval to study in Australia must first be granted by the Australian government. Prospective students must, in the first instance, contact the Australian High Commission or the Embassy nearest their home in April/June of the year before they wish to commence their studies.

Applications to enter first year at Swinburne Institute of Technology (or any other college of advanced education or university in Victoria) should be made before the end of October, to the Victorian Universities Admissions Committee (VUAC).

Applications to enter later years of tertiary courses should be made direct to the Registrar of the Institute. Governments of some countries have special requirements for their nationals who wish to study in Australia; information should be obtained from the Australian High Commission or the public service in that country.

Private overseas students have to pay a charge of $1500. This charge will be levied by the Commonwealth Department of Immigration and Ethnic Affairs and not by this institute.

Postgraduate

Entrance requirements

Applications for admission to postgraduate courses are expected to have completed a degree or diploma.

The specific requirements vary from course to course: some are open to those with any tertiary qualifications, others may require a qualification in a specific discipline or range of disciplines.

Provision is made for admission of applicants who have qualifications other than or less than the normal requirements outlined above but whose employment position or experience indicates an ability to benefit from the course.

Requirements for specified courses are set out in the various faculty handbooks.

Application procedure

All applications for enrolment in postgraduate courses must be made directly to the institute. Application forms are obtainable from the Admissions Officer, 819 8386.

Applications for admission to postgraduate courses should be received by:

- Arts: 17 November 1980
- Urban Sociology: 20 November 1980
- Engineering: 16 January 1981

*Further applications will be received after this date if places are available.

Enrolment regulations

Definitions

In this section:

- ‘enrolment’ includes ‘re-enrolment’;
- ‘enrolment form’ includes ‘re-enrolment form’;
- ‘subject’ means any area of study which is part of a course leading to an award and which has a title and code number in the subject register maintained by the Student Records office; the singular includes the plural;
- ‘awarding department’ means the department or, where courses are organised on a faculty basis, (Applied Science, Arts and Business) the faculty responsible for the particular course; ‘head of awarding department’ includes the dean of the faculty where appropriate; unless the contrary intention is expressed.

Conditions of enrolment

Before enrolling in any course or subjects, students must have the approval of the head (or nominee) of the appropriate awarding department.
Students must complete the enrolment form including, under the appropriate faculty heading, all subjects which they intend to study during the year and
(i) provide all required statistical information
(ii) sign and date the declaration section of the form
(iii) pay the prescribed Student Union and Sports Association fee, and
(iv) lodge the form at the cashier’s office

Enrolment categories
The Academic Board has approved the enrolment categories listed below:

Deferred entry
An intending first year student defers enrolment for up to one year on receipt of an offer of a place. (See also Deferred entry in Application procedure section)

Leave of absence
The suspension of enrolment during a course for a specified period at the discretion of the appropriate Faculty Board on the understanding that the enrolment will be resumed at the end of the period. (See also Leave of absence)

Amendment to enrolment
The addition, deletion or changing of subject or unit enrolments in a student’s course of study. (See also Amendments)

Withdrawal
The voluntary notification of a cancellation of enrolment. (See also Withdrawal from all study)

Abandonment
The discontinuation of enrolment without formal notification.

Exclusion
The prohibition from continuing a course for a specified period.

Deferment, therefore, is applicable to students who have received an offer of a place but have not yet enrolled. Leave of absence is applicable to students who have formally enrolled for a course (see under Conditions of enrolment).

Confirmation of institute records
The institute recognises that errors can be made in the transcription of enrolment details from original copies of enrolment forms to the computer-held files. It is also realised that such errors can cause a great deal of inconvenience to students (and staff) if not detected.

Students are therefore asked to check the record of each semester’s enrolment prior to the end of the seventh week of the semester.

To assist in the checking process, a computer-printed statement of enrolment will be posted to each student approximately four weeks after the commencement of each semester.

Students who do not check the statements, or who do not notify the Student Records office of any errors existing in the records will be required to pay a substantial fee ($5.00 or part thereof per amendment required) for each amendment to be made after the closing date for enrolment files.

Fees
With certain exceptions, tuition fees were abolished some years ago and thus, most students are no longer required to pay such fees.

However, all enrolled students are required to pay Student Union and Sports Association fees. At the time of going to press the Student Union and Sports Association fees for 1981 had not been determined.

In 1980 the fees were:
- Full-time students — more than one semester academic $45.00
- Full-time students — at least one semester of work experience $30.00
- Part-time students $20.00

For all institute purposes a part-time student is one enrolled for subjects which require a total class, tutorial and/or laboratory contact time of less than 75% of a full-time course load.

Students studying under the cooperative format are considered to be full-time students. They qualify for the special fee rate only in those years which include work experience. These are:
- Applied Science Degree, 2nd and 3rd years;
- Applied Science Diploma (Environmental Health) 2nd and 3rd years;
- Art (Graphic Design) Degree, 3rd year;
- Civil Engineering Degree, 3rd and 4th years;
- Electrical Engineering Degree, 3rd and 4th years;
- Manufacturing Engineering Degree, 3rd and 4th years.

Late enrolment fees
Students who do not attend for enrolment (including any required review of second semester subjects) on the date and at the time specified by their faculty or awarding department, may be required to pay a late fee of $5.00 per week or part thereof from the date on which their attendance was required, to the date on which the completed forms are lodged with the cashier, in order to be enrolled for the year or the semester concerned.

Amendments

Amendments to enrolment
Students may only amend their course, subject or unit enrolments by completing an Amendment to enrolment form which is available from the Student Records office or the Secretary of the student’s faculty
Refunds

Refunds where of 1981 31 a March are made after department faculty. be fees made after department faculty.

Applied Science (Mr J. Ure)
Art (Mrs J. Forbes/Mrs R. Lord, Secretary to the Dean of Art)
Arts (Mrs E. Williams)
Business (Miss V. Stiles)
Engineering (Mr A. Miles)

Every amendment must be approved by the head (or nominee) of both the student's awarding department/faculty and of the department responsible for teaching the subject or unit concerned.

An amendment does not take effect (that is, a student has not withdrawn from, nor added, any subject or unit) until the Amendment to enrolment form, duly approved, has been lodged at the Student Records office and any required fee paid.

Amendments after the 7th week of a semester
A student who cancels a subject or unit after the end of the seventh week of the semester in which final assessment for that subject or unit takes place (that is, for subjects or units assessed in first semester — 3 April 1981 and for subjects or units assessed in the second semester — 11 September 1981) will be recorded as having failed that subject or unit unless special permission to withdraw has been given by the head of the student's awarding department/faculty.

Amendments after the close of enrolment files
After 30 April (first semester) and 30 September (second semester), changes in a student's enrolment will only be made after personal application to the Registrar and then only if special circumstances exist. A late fee of $5.00 per subject per week will be payable.

Additional fees
A part-time student who adds any subject to those for which he or she was enrolled and thereby increases the number of contact hours involved in his or her course of study to more than 75% of the full-time course load will be required to pay the difference between the part-time and the full-time Sports Association and Student Union fee.

No refunds on reduction
No refund of fees will be made where a student withdraws from study or lodges an application for refund of fees after 31 March 1981.

Refund of fees — no later VUAC offer
A student who withdraws and does not receive a higher preference offer from VUAC, may receive a refund of fees, less a $5.00 service charge, if notice of the withdrawal and application for the refund is lodged at the Student Records office, administration building, prior to 31 March 1981.

No refunds after 31 March 1981
No refunds of fees will be made where a student withdraws from study or lodges an application for refund of fees after 31 March 1981.

No refunds if identity card not returned
No refunds will be made under any of the provisions set out above if students do not return their identity cards.

Exemptions
Where a student has undertaken a subject at another institution and wishes to receive credit for the subject towards a course at Swinburne Institute of Technology, formal application for such exemption must be made:

Application forms are available from the Student Records office or the secretary of the student's faculty. When completed, they should be lodged with the faculty secretary.

Original documentary evidence should be attached to every application. Original documents will be returned to the applicant if a photostat copy is also attached.

Students should apply for exemptions at the earliest possible moment.

Substitute major study
Any student who wishes to incorporate in a course at Swinburne Institute of Technology a major study from any other institution must apply in writing to do so before the commencement of the student's second semester at the College and that request must be considered and resolved at that time by the faculty board concerned.

Applications should be addressed to the Registrar. Any such application is subsequently considered by the Academic Board and the Council which may need to make its recommendations to another body in accordance with a time scale which the other body has determined.

Amendments to personal details
A student who changes his or her name, address or place of employment should complete an Amendment to personal details form which is available from the Student Records office.

Students recording a change of name will be required to produce legal documentary evidence (e.g. marriage
Certificate, statutory declaration, deed poll certificate) in addition to completing an Amendment to personal details form.

Notice of special requirements
Information which affects students’ progress in their courses is displayed from time to time on institute, faculty and departmental notice boards. The display of this information for two weeks, will be deemed to be adequate notice to all students concerned.

Students are therefore recommended to check institute (quadrangle and administration building), departmental and faculty notice boards at least once every two weeks.

Leave of absence
Students who have enrolled in a course and who wish to take leave of absence should apply on an Amendment to enrolment form.

Students who have been granted leave of absence will be notified in writing by the faculty concerned. Enrolment for all subjects for the duration of the leave will be cancelled automatically.

A student who wishes to commence leave of absence after the end of the seventh week of the semester in which final assessment takes place (that is for subjects or units assessed in the first semester — Friday 3 April 1981 and for subjects or units assessed in the second semester — Friday 11 September 1981) will be recorded as having failed those subjects or units for which he or she was enrolled unless special permission to cancel the enrolment had been given by the head of the student’s awarding department or faculty.

Withdrawal from all study
A student who intends to withdraw from all study must lodge an Amendment to enrolment form to indicate this intention and return his or her identity card.

A student who withdraws after the end of the seventh week of the semester in which final assessment for the subjects or units for which he or she was enrolled (that is for subjects or units assessed in the first semester — Friday 3 April 1981 and for subjects or units assessed in the second semester — Friday 11 September 1981) will be recorded as having failed those subjects or units for which he or she was enrolled unless special permission to withdraw had been given by the head of the student’s awarding department or faculty.

A student who withdraws from all study who does not notify the institute as prescribed above will be recorded as having failed all subjects and units for which he or she was enrolled.

Identity cards
All students enrolling or re-enrolling at the institute or the technical college will be issued with an identity card at the Library.

These are not transferable and are valid only when signed. A current card must be produced when borrowing or photocopying, otherwise service may be refused.

Loss of an identification card must be reported immediately to the Readers’ Services Secretary, Level 2, Library, otherwise they can take no responsibility for items borrowed on that card. Lost or damaged cards may be replaced at a cost of $1.00.

If a student wishes to withdraw or to take leave of absence, his or her identity card must be returned to Student Records.

Assessment regulations
Copies of the institute assessment regulations are available for perusal in the library.

Awards
Students nearing completion of their courses may obtain a statement indicating those subjects passed and those subjects required to complete their courses. Fee $5.

Any student who has been involved in a change of syllabus (e.g. from the 1974 syllabus to the 1974 syllabus revised 1978, or to the 1979 syllabus etc.) and who has not previously obtained a statement, would be wise to do so before starting the final semester.

Special examination for last subject of award
A student who has, at the most recent set of final examinations or assessments, passed all except one subject or unit for an undergraduate diploma or degree shall be entitled to apply for permission to sit for a special assessment or examination.

This provision will apply retrospectively where a student has failed a subject/unit in the penultimate semester and where this subject/unit was not available for the student to repeat in the final semester.

The provision does not apply to graduate courses.

Application should be made to the Student Records office within ten calendar days after the date of publication of results. Fee for checking that the subject is the last for an award — $1.50.

The special examination should be held, or work for a special assessment submitted, by a date set within two months of the publication of the original results for that subject. The result should be notified to Student Records within 14 days after the two-month period.

Applications for degrees and diplomas
Students eligible to be admitted to a degree or to be awarded a diploma, graduate diploma or certificate by this institute, are required to apply for the award on the form prescribed. Forms are available from, and must be lodged at, the Students Records office, administration building.

Applications for all awards close on 31 October of the year in which the student anticipates completion of the academic work for the award.
Students who expect to qualify for an award are advised to apply as early as possible and not defer application until the closing date. This will ensure that a statement certifying qualification for the particular award, or for admission to the particular degree, can be posted to the student immediately after qualification. Statements will be produced strictly in order of receipt of application — the early receipt of such a statement can make a significant difference to a graduand’s salary.

Dates for finalising awards
Students who apply to have their degrees conferred at the 1981 graduation ceremony should ensure that all outstanding results (deferred results, results for special examinations, etc.) are finalised by the beginning of March 1981 so that lists of graduands may be prepared.

Those who apply to have their diplomas conferred at the 1981 ceremony should ensure that any required practical experience (see below) is completed and all outstanding results finalised by the beginning of April 1981.

Industrial experience for diplomas and certificates
Students should note that periods of industrial experience are required to qualify for the award of the following diplomas and certificates:

<table>
<thead>
<tr>
<th>Diploma/Certificate</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry diploma</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Applied Chemistry diploma</td>
<td>12 weeks</td>
</tr>
<tr>
<td>All Engineering diplomas</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Applied Chemistry certificate</td>
<td>4 weeks</td>
</tr>
<tr>
<td>All Engineering certificates</td>
<td>4 years</td>
</tr>
</tbody>
</table>

If industrial experience has not been completed at the time of lodging the application for the award, students should attach a note explaining when they expect to complete it. Students who have not yet commenced employment should advise the Student Records office to that effect, and should again contact the office when they actually take up employment.
Academic staff .................................. AS2
Courses offered ................................ AS3
Entrance requirements ........................ AS4
Course details .................................... AS7
Undergraduate
— Common first year .......................... AS7
— Degree of Bachelor of Applied Science .... AS7
— Diploma of Applied Science
  (Applied Chemistry) ....................... AS11
— Diploma of Applied Science (Biochemistry) . AS11
— Diploma of Applied Science
  (Environmental Health) ................. AS13
Postgraduate
— Applied Colloid Science .................. AS14
— Biomedical Instrumentation .............. AS14
— Computer Simulation ...................... AS14
— Industrial Microbiology .................. AS15
— Scientific Instrumentation ............... AS15
Subject details ............................... AS16
General information .......................... G1
Faculty of Applied Science

Dean
P.F. Nelson, DAppSc, MSc, FRACI

Academic staff

Department of Applied Chemistry
Head
A.P. Gardner, MSc, DipEd, MRSC, ARACI

Principal lecturers
I.K. Jones, PhD, BAppSc, DipEd
R.L. Laslett, MSc, DipEd, ARACI
I.G. McWilliam, DSc, FRACI

Senior lecturers
W.L. Baker, BSc(Hons), PhC, MPS, ARACI, TTTC
L.C. Bowater, PhD, BSc(Hons), DipEd, ARACI
K.R. Harris, BSc, DipAppChem, ARACI, TTTC
P.J. Havlicek, MSc, TTTC, ARACI
G.L. Hill, MAppSc, DipAppChem, ARACI, MACE, TTTC
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M.J. Toohey, BSc, DipEd, ARACI, CertASNT

Lecturers
E.F. Carter, BA, MSc, DipEd
Madeleine Corbett, PhD, BSc(Hons), ARACI
R.F. Cross, PhD, BSc(Hons), DipEd, ARACI
J.V. Culka, PhD, BSc(Hons)
J.W. Davis, DipPHI, MAIHS, MRSH
J.M.P. FitzGerald, PhD, BSc(Hons), PhC, MPS
L.J. Michel, PhD, BSc(Hons), DipEd, ARACI
L.Y. Misconi, PhD, MSc, DIC
R.G. Morris, DipPHI, MAIHS
M. Natarajan, PhD, MSc
Jacqueline O’Connor, MSc, ARMIT, MEd, ARACI, MACE
J. Raiston, PhD, MSc, DSc, Dipl Ed, ARACI
M.E. Redwood, PhD, BSc(Hons), ARACI
G.G. Rose, PhD, BSc(Hons), ARACI
Margaret J. Scarlett, PhD, BSc, DipEd
A.P. Towns, PhD, BAppSc

Senior demonstrators
Barbara Buchanan, BSc, TSTC
Elizabeth Durre, BSc, DipEd
S.A. Leverton, BSc(Hons)

Instructor
P.J. Kelly

Department of Computer Studies
Head
G.A.K. Hunt, BA, DipAppChem, MBCS

Lecturers
J.R.F. Alonso, MSc, GMICHEM, ARACI, AIChE, ACS, MIEAust, EIT, PE
G.P. Martin, PhD, MSc, MIEE, MACS
I.M. Smith, BSc(Hons), DipEd, MAV

Senior tutor
P. Reid, BEng

Department of Mathematics
Head
R. Kavanagh, MA, MSc, MAORS, MORS

Principal lecturers
A.K. Easton, PhD, MSc, DipT, FIMA, FRMetS
P.A. Evans, MSc, DipEd, MAORS
J.R. Iacono, BA, MSc, TTTC

Senior lecturers
N. Garnham, MSc, DipEd
P.H. Green, BA
W. O’Dell, BA, DipEd
J.F. Pidgeon, BA, DipEd
C. Scott, MEd, BA, BSc, ATII(Cert)
H.V. Yeo, BA, TTTC

Lecturers
C.R. Barling, MSc
S.R. Clarke, BSc(Hons), MA, DipEd
J. Gray, BSc, BEd
E.P. Hauser, MSc, DipEE, TTTC
J.C. Herzel, PhD, MSc, BA, AAIP
M.N. Hunter, MSc
P.L. Jones, PhD, BSc, DipEd
T. Peachey, BSc(Hons)
B.R. Phillips, MSc(SocSci), BSc, BEd
P. Robb, BA, MSc, TSTC, MACS
J. Steiner, PhD, BSc(Hons)
K.G. Williams, BSc, MSc, MORS
(one to be appointed)

Senior tutors
Glenda Francis, BSc(Hons)
J. Yearwood, MSc

Department of Physics
Head
S.J. Rackham, MSc, BEd, FRMTC, FAIP, TTTC, MACE

Deputy head
C.G. Sibley, BSc, DipEd

Senior lecturers
E.D. McKenzie, MSc, CertEd, MAIP, MARPS
R.B. Silverstein, PhD, BSc(Hons), MAIP, MIBME, MACPSM

Lecturers
P.S. Alabaster, PhD, MSc, MAIP
J. Hennessy, BSc, DipMet, MAIP, TCert
D. Lamble, BSc(Hons), DipEd, MAIP
J.M. Venema, BSc, BA, TTTC, DipEE
D. Ward-Smith, PhD, BSc(Hons), MAIP
A.W. Wood, PhD, MSc

Senior demonstrator
R.G.D. Roberts, MSc, DipEd, DipT
Applied Science courses

Degree of Bachelor of Applied Science
The full-time degree courses are programs of cooperative education which extend over seven semesters (three and a half years) and include two semesters of work experience. They comprise two major studies chosen from applied chemistry, biochemistry, biophysics, chemistry, computer science, instrumental science and mathematics. Students spend a total of twelve months gaining professional experience in industry, business, clinics or research laboratories depending on their area of study. The degree courses can also be studied on a part-time basis. Classes are offered in the evening for part-time students if student numbers are sufficient.

Diploma of Applied Science (Chemistry)
Diploma of Applied Science (Biochemistry)
Diploma of Applied Science (Environmental Health)
These courses are available for either full-time or part-time study. They are of three years duration when studied full-time.

Diploma of Applied Science (Applied Chemistry)
These diploma courses are available for either full-time or part-time study. They are of three years duration (post-HSC) when studied full-time.

Diploma of Applied Science (Environmental Health)
This course is the only recognised training for health surveyors in Victoria and is available for both full-time and part-time study. The full-time course extends over seven semesters (three and a half years) and includes two semesters of work experience. Part-time students can complete the academic work of the course over a five year period. The required work experience is usually gained during this period.

Graduate Diploma courses
The Faculty of Applied Science offers graduate diploma courses in the following areas of study
— Applied Colloid Science
— Biomedical Instrumentation
— Computer Simulation
— Industrial Microbiology
— Scientific Instrumentation
These courses are available for part-time (evening) study only and are designed to be completed over a two-year period.

Higher degrees
Individual applications for candidature for the Degree of Master of Applied Science may be made through the Faculty of Applied Science. Intending candidates should, in the first instance, obtain details from the Faculty Secretary, Mr J. S. Ure, 819 8481.

Professional recognition
The courses leading to degrees in applied science with a double major in applied chemistry or biochemistry and the diplomas in applied chemistry and biochemistry are recognised by the Royal Australian Chemical Institute. The courses leading to a degree and including the major in computer science are recognised by the Australian Computer Society as satisfying the academic requirements for membership.

The course leading to the diploma in applied science (environmental health) is recognised by the Commission of Public Health and the Australian Institute of Health Surveyors.

It is expected that graduates who have majored in other study areas will be eligible for membership of the appropriate professional bodies.

Career potential
The applied science courses at Swinburne cover a very wide range of career opportunities. Brief descriptions of the areas of application of the courses are as follows:

Applied Chemistry
Applied Chemistry is the study of chemical principles and their application to industrial problems. Graduates may find industrial careers in production, quality control, sales, technical services, research and development, and administration.

Biochemistry
Biochemistry is the study of the chemistry of living matter and is based on the principles of organic and physical chemistry. Biochemists study the chemical composition of living organisms and the physical and chemical processes of the living cell. Applied biochemistry encompasses the chemistry of fermentation, nutrition, agriculture and medicine.

Graduates are employed in industry particularly in the manufacture of drugs and pharmaceuticals; in the food industry, in milk, butter and cheese production, and in the stock-feed industry. They are also employed in medical clinics, hospitals, pharmaceutical and veterinary laboratories, and in medical research.

Biophysics
Biophysics is the study of human physiological processes together with the instrumentation used to monitor and control them.

Graduates may take up careers as hospital scientists or technologists. Their duties may involve biomedical research, routine clinical responsibility, the development of specialised electronic equipment and the maintenance of equipment already in operation. They are employed in most hospital departments including cardiology, neurology, thoracic medicine, physical sciences, anaesthesiology and medical electronics.

In industry there are opportunities for graduates to take up development and consultancy positions in organisations serving the medical and biological professions.
Computer Science
The advent of electronic computers has created a whole new range of employment opportunities, and a knowledge of computers and their uses is becoming increasingly necessary for graduates in the physical and biological sciences.

Graduates will be employed in various areas depending on the combination of major studies chosen. For example, a student who had majored in computer science/instrumental science could be concerned with special purpose computer controls for the control of real-time processes such as power generation, steel processing or the manufacture of chemical materials. A chemistry/computer science graduate could be interested in the simulation of complex chemical processes while a mathematics/computer science graduate would be well trained to tackle the solution of the usually intractable problems found in applied mathematics.

Instrumental Science
The study of instrumental science provides students with a sound basis of measurement and instrumentation principles and their use in the development of instrumentation for the various areas of applied science and technology. In the study of a wide range of instruments, emphasis is placed on electronic, nuclear, chemical, ultrasonic and optical instrumentation, on signal processing by analogue and digital electronic techniques, and on the interfacing of instruments with microprocessors and computers.

This field of study is unique to Swinburne and is an appropriate major to be combined with biophysics, chemistry, computer science or mathematics.

Mathematics
The applied mathematics of probability theory is used whenever numerical data arise in business, scientific, economic or industrial investigations, and a major in mathematics provides valuable experience for potential statisticians, computer programmers, operations research or quality control experts. Specialist mathematical skills are required in the solving of problems which arise, for example, in medical research, building research, animal health, poultry research, forest products, fisheries, metrology, food preservation, wool research or protein chemistry. Statistical skills are also used in the designing of trials such as those to study the effectiveness of various fertilisers or fodder; and in assessing the effectiveness of, for example, traffic control, insecticides or new drugs.

The completion of a mathematics major is necessary in order to become a fully qualified science/mathematics teacher.

Health Surveying
The majority of health surveyors are employed by local authorities and by the State Health Department, but many work with statutory authorities such as the Environment Protection Authority, the State Rivers and Water Supply Commission and the Dandenong Valley Authority. Opportunities also exist in other state and federal departments.

Health surveyors can thus be involved in varied duties such as infectious disease control and immunisation, enforcement of health standards in food shops, restaurants, hotels, etc., food quality surveillance, the control of domestic waste disposal, industrial hygiene, poisons control and pollution control.

Opportunities also exist in industry, particularly the food industry, where health surveyors assist with quality control work and in complying with health and pollution laws. It is anticipated that the number of these opportunities will increase.

Entrance Requirements

Degree/Diploma in Applied Science
Standard entry to the first year of the degree/diploma course requires satisfactory completion of a year twelve (sixth form) course of study in a Victorian secondary school, or its equivalent. It is recommended that students should have studied English, chemistry, physics, pure mathematics and applied mathematics.

Students who complete satisfactorily the Science/Engineering course of the Tertiary Orientation Program offered by Swinburne Technical College will be given preferred entry to the first year. This course comprises English, chemistry, physics, science/engineering mathematics and concepts of mathematics. Students who have studied other Tertiary Orientation Program subjects will be considered for entry on their merits.

The Tertiary Orientation Program is designed specifically to prepare for tertiary entry, students who have passed the Technical Leaving Certificate or fifth form in English, mathematics, physics and chemistry.

For further details of this course refer to the section on General Studies Division, in the Swinburne Technical College handbook.

Diploma of Applied Science (Environmental Health)
Standard entry to the first year of the course requires satisfactory completion of a year twelve (sixth form) course of study in a Victorian secondary school, or its equivalent, or other evidence of capacity to succeed in the course. A background of chemistry, physics and mathematics is recommended but knowledge of these subjects at HSC level is not assumed.

Graduate Diploma in Applied Colloid Science
Entry is open to applicants with a first tertiary qualification in engineering or science. An applicant whose experience in chemistry is considered to be inadequate is required to undertake a course in physical chemistry prior to admission.

Graduate Diploma in Biomedical Instrumentation
Entry is open to applicants with a first tertiary qualification in a scientific or medical discipline. An applicant whose position or experience indicates an ability to benefit from the course may be accepted with other qualifications or with less than the normal entry qualifications.
Graduate Diploma in Computer Simulation
Entry is open to applicants with a first tertiary qualification in engineering, science or economics. An applicant whose position or experience indicates an ability to benefit from the course may be accepted with other qualifications or with less than the normal entry qualifications.

Graduate Diploma in Industrial Microbiology
Entry is open to applicants with a first tertiary qualification in science or engineering. An applicant whose position or experience indicates an ability to benefit from the course may be accepted with other qualifications or with less than the normal entry qualifications.

Graduate Diploma in Scientific Instrumentation
Entry is open to applicants with a first tertiary qualification in a scientific or engineering discipline. An applicant whose position or experience indicates an ability to benefit from the course may be accepted with other qualifications, or with less than the standard entry qualifications.

Mature-age entry
Special provision is made whereby mature-age applicants may be accepted to the first year of the undergraduate courses with less than the normal entry prerequisites. This provision applies to persons who are in regular and relevant employment, but not to students who have recently failed the HSC examinations.

Admission — ad eundem statum
Certain subjects passed at another institute, or at a university may provide advanced standing in the above courses. Each application will be considered individually by the heads of the appropriate departments in consultation with the Applied Science Faculty Board.

Diploma/degree conversion courses
Holders of recent chemistry and biochemistry diplomas who wish to study for degrees in applied science (applied chemistry and biochemistry) may apply, preferably before 1 November, for admission to the degree courses. Such applications are individually considered by the Head of the Department of Applied Chemistry in consultation with the faculty board.

Conversion course students are required to pass appropriate subjects from the degree course; undertake a project and write a thesis (SC404).

Laboratory material requirements
Students are expected to provide laboratory coats, safety spectacles, practical notebooks, and minor equipment such as spatulas.

Other laboratory equipment and a locker are provided for student use on payment of a refundable deposit of $15. Lockers are allocated by the chemistry laboratory manager to whom application for a locker must be made at the time of enrolment.

Laboratory and practical work requirements
In all appropriate subjects a student must perform satisfactorily in practical or laboratory work in order to gain a pass. Each enrolling student must either complete adequately the laboratory work relevant to the current year, or obtain reapproval for work previously completed at Swinburne or elsewhere.

Students seeking such reapproval should consult the lecturer in charge of the subject.

Mentor scheme
Each undergraduate student, whether part-time or full-time will be allocated to a particular member of staff who will be known as the student’s mentor. These mentors will be responsible for guidance on student difficulties, courses, exemptions and re-enrolments.

Re-enrolment
Re-enrolling students who require advice about their courses should consult their mentors. If an old syllabus is being followed (these are not included in this handbook), changes may be necessary either to complete the old syllabus or to effect the change to a new syllabus. Students who are in doubt about their courses should consult their mentors before attempting to re-enrol.

Assessment of student performance
Student performance is assessed by various methods e.g. formal examinations, tests held during the semester, project work, assignments and laboratory reports. A statement of the workload requirements and the assessment program for each course is displayed on the faculty notice board early in each semester.

The Applied Science Faculty Board operates a scheme of passing by years which applies to all students enrolled in full-time and cooperative undergraduate courses, and to all students enrolled in part-time undergraduate courses arranged in the standard format. Under this scheme a student in any year will be assessed on the whole of the year’s work rather than on individual subjects.

At the end of each year a student will —

(i) pass outright (i.e. pass in all subjects)
or
(ii) be passed by the faculty board on the year as a whole (i.e. be granted a ‘faculty pass’ on the year)
or
(iii) not pass but be permitted to repeat the year’s work
or
(iv) not pass and be permitted to repeat the subjects failed while retaining credit for the subjects passed.

Subjects studied are usually classified in the following categories of assessment:

<table>
<thead>
<tr>
<th>HD</th>
<th>High Distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Distinction</td>
</tr>
<tr>
<td>C</td>
<td>Credit</td>
</tr>
<tr>
<td>P</td>
<td>Pass</td>
</tr>
<tr>
<td>N</td>
<td>Not pass</td>
</tr>
</tbody>
</table>

Faculty of Applied Science
The overall faculty result is calculated using a weighted average system involving the product of the assessment value and the formal contact hours for each subject. Where a student fails to satisfy the assessors in any subject(s) the final decision for a faculty pass is made by the faculty board after consultation with the appropriate teaching department.

**Cooperative education**

In the applied science faculty, the degree courses and the diploma course (environmental health) are undertaken as programs of cooperative education. In these programs students learn in both academic and work settings, and these two phases of learning are related to one another in a planned manner. Swinburne, the employer and the student collaborate to provide a complete professional education.

Students benefit educationally as they are provided with practical experience in solving real problems under authentic conditions using the theoretical concepts learned in the classroom. They are given an appreciation of the structure and purpose of the various organisations concerned, enabling them to make more realistic decisions regarding the area of the profession in which they wish to become involved. There are also financial benefits in that students are paid a salary during the work experience semesters.

Employers of cooperative students benefit by obtaining a reliable and continuing source of manpower and by establishing a direct liaison with the institute. Contact with cooperative students assists employers in choosing the best graduates and reducing the cost of recruiting and training new professional staff.

The students are visited regularly by academic staff during their industrial semesters. Some students may have the opportunity to obtain work experience overseas. In such cases, academic staff from local educational institutions visit the students at their places or work. A program of exchange between Swinburne and University of Surrey in England has been of particular value to chemistry students.
Course details

All students studying for a degree or a diploma (except in Environmental Health) undertake a common first year of compulsory subjects which must be completed before enrolling for any later year subject. The common first year is also available for part-time evening study over a two-year period.

Common first year — full-time

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Common first year — part-time

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On completion of the common first year, selection is made in consultation with the teaching staff of each student's future areas of study. Selection takes into account the student's areas of interest, the academic ability shown during the first year and an assessment of the student's aptitude for the various areas of study. Quotas may apply for individual majors in the second year.

Degree of Bachelor of Applied Science (1979 syllabus)

To qualify for a degree, a student must successfully complete the common first year and one of the following courses:

(a) double major in applied chemistry
(b) biochemistry combined with chemistry
(c) biophysics combined with instrumental science
(d) chemistry combined with computer science, instrumental science or mathematics
(e) computer science combined with chemistry, instrumental science or mathematics
(f) instrumental science combined with biochemistry, chemistry, computer science or mathematics
(g) mathematics combined with chemistry, computer science or instrumental science.

The various degree course structures are described below. Some major studies or combinations of major studies may not be offered if student demand is insufficient.

1 Double major in Applied Chemistry

This course provides for the students whose main interest is in chemistry, a thorough basis for a future career as a professional, industrial or research chemist. It features a series of elective subjects which support and extend the main themes of chemistry while amplifying the students' industrial experience.

Full-time course

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Semester 5

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Semester 6

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### Semester 7

- **SC431** Physical Chemistry 2 36
- **SC441** Analytical Chemistry 3 54
- **SC461** Organic Chemistry 2 36
- **SC491** Elective subjects (4) 4 72
- **SC409** Seminars 2 36
- **BS495** Business Studies 4 72

*The elective subjects are chosen from the following list:

1. **(a) Subjects which may be studied in the second, third or final year**
   - SC212 Solution Chemistry
   - SC213 Chemical Process Industries
   - SC215 Crystal Chemistry
   - SC223 Analysis of Organic Compounds

2. **(b) Subjects which may be studied in the third or final year and of which some have specific entry requirements**
   - SC305 Lubrication and Lubricants
   - SC312 Inorganic Biochemistry
   - SC313 Environmental Parameters
   - SC314 Electrochemical Technology
   - SC316 Electroanalytical Techniques
   - SC321 Organometallics
   - SC322 Radiation Chemistry of Polymers
   - SC323 Industrial Organic Chemistry
   - SC324 Technology of Polymers
   - SC325 General Polymer Chemistry
   - SC326 Surface Coatings

3. **(c) Subjects which may be studied only in the final year and of which some have specific entry requirements**
   - SC401 Soil Chemistry
   - SC403 Advanced Soil Chemistry
   - SC405 Ceramic and Silicate Chemistry
   - SC406 Chemical Physiology
   - SC407 Liquid and Solid Fuel Technology
   - SC408 Instrumental Techniques
   - SC412 Paints, Emulsions and Detergents
   - SC413 Gaseous Fuels, Theory and Technology
   - SC415 Food Chemistry
   - SC421 Applied Organic Synthesis
   - SC423 Bio-organic Chemistry
   - SC425 Heterocyclic Chemistry
   - SC427 Steroids
   - SC429 Computers in Chemistry

*The above elective subjects in groups (a), (b) and (c) will not all be offered in any one year. Their availability will be determined in response to student requirements.

### Part-time course

Students in approved employment can complete this degree course in six semesters (three years) after completion of the common first year. Further information is available from the Head of the Chemistry Department or from the Faculty Secretary.

### 3 Chemistry/Instrumental Science

Modern chemical laboratories use a wide range of complex scientific equipment and there is at present a shortage of chemists with a detailed knowledge of the design and operation of this equipment. This combination of major studies, unique to Swinburne, provides training for instrumental chemists.

The course combines a study of chemistry with nuclear and optical instrumentation, control and measurement theory and microprocessor operation and applications, with emphasis on the applications of analogue and digital electronics.

### Full-time course

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<tr>
<th>Semester 3</th>
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<tr>
<td>SA209 Work Experience</td>
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**2 Biochemistry/Chemistry**

The course involves the study of the structure and function of the chemical systems of living organisms and the application of this knowledge in the areas of clinical chemistry, pharmaceutical chemistry, the food industry, and other fields. The course also provides a sound background in the theory and application of analytical and preparative techniques in the practice of biochemistry, reinforced by the inclusion of industrial experience.
Faculty of Applied Science

Semester 5
SA309 Work Experience

Semester 6
SC331 Physical Chemistry 3 54
SC351 Inorganic Chemistry 3 54
SC361 Organic Chemistry 3 54
SP306 Physics 3 54
SP313 Instrumental Science 9 162
SP304 Signals and Systems 3 54

Semester 7
SC431 Physical Chemistry 2 36
SC441 Analytical Chemistry 3 54
SC461 Organic Chemistry 3 54
SP405 Elective subject (I) 1 18
SP413 Instrumental Science 8 144
SA409 Special Project 4 72
BS495 Business Studies 4 72

* The elective subjects are listed under Double major in Applied Chemistry.

4 Biophysics/Instrumental Science

This combination is unique to Swinburne and is designed to produce research and development staff for hospitals and industry. The course offers the student a firm grounding in instrumental and life sciences. The biophysics has a clinical orientation and consists of two parallel streams, human physiology and biophysical instrumentation.

A thorough appreciation of instrumental philosophies and techniques is offered in instrumental science. Areas of study in this major include nuclear, acoustic, ultra-violet, X-ray and optical instrumentation together with a strong emphasis on information processing, digital and analogue electronics.

Full-time course

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<td>BS495 Business Studies</td>
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</table>

* The elective subjects are listed under Double major in Applied Chemistry.

5 Computer Science/Chemistry

Computers are of increasing importance in chemistry. They allow the storage of large amounts of chemical information (including abstracts of scientific papers), the retrieval of information from these data bases, the storage and processing of data from scientific instruments, the simulation of experiments, and computer-assisted instruction.

The computer science major provides the computer background and techniques for the development of these applications. The chemistry major provides the chemical knowledge which is needed for an understanding of the use of computers in chemistry.

Full-time course

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6 Computer Science/Instrumental Science

The computer science major involves the study of algorithms used in the solution of mathematical, engineering and business problems and the implementation of these in a suitable algorithmic or business-oriented language. The work is supplemented during the latter years of the course by studies in logic, programming techniques and systems science.

The ‘software’ emphasis in computer science is complemented by the strong ‘hardware’ orientation of instrumental science. Areas of study in this major include nuclear, acoustic, ultra-violet, X-ray and optical instrumentation together with a strong emphasis on information processing, digital and analogue electronics.

Full-time course

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</tr>
<tr>
<td></td>
<td>SC331 Physical Chemistry</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>SC351 Inorganic Chemistry</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>SC361 Organic Chemistry</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>SP305 Physics</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>Semester 7</td>
<td>SK403 Computer Science</td>
<td>8</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>SC431 Physical Chemistry</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>SC441 Analytical Chemistry</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>SC461 Organic Chemistry</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Elective subject (I)</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>SA409 Special Project</td>
<td>4</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>BS495 Business Studies</td>
<td>4</td>
<td>72</td>
</tr>
</tbody>
</table>
7 Instrumental Science/Mathematics

The mathematics major concentrates on the operations research approach to problems in business, industry and government. Mathematical and statistical models such as linear programming, network analysis, queuing theory, regression analysis, etc., are used to solve problems in inventory control, resource planning, allocation and other areas.

A thorough appreciation of instrumental philosophies and techniques is offered in instrumental science. Areas of study in this major include nuclear, acoustic, ultra-violet, X-ray and optical instrumentation together with a strong emphasis on information processing, digital and analogue electronics.

Full-time course

<table>
<thead>
<tr>
<th>Semester 3</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP213 Instrumental Science</td>
<td>8</td>
<td>144</td>
</tr>
<tr>
<td>SM251 Mathematical Methods</td>
<td>8</td>
<td>144</td>
</tr>
<tr>
<td>SK213 Computer Science</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>or SK214 Computer Science</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>SA201 Industrial Case Studies</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>AT291 Complementary Studies</td>
<td>2</td>
<td>36</td>
</tr>
</tbody>
</table>

| Semester 4 | SA209 Work Experience |
| Semester 5 | SA309 Work Experience |

| Semester 6 | SM351 Mathematical Methods | 9 | 162 |
| SC331 Physical Chemistry | 3 | 54 |
| SC351 Inorganic Chemistry | 3 | 54 |
| SC361 Organic Chemistry | 3 | 54 |
| SP305 Physics | 3 | 54 |
| SK313 Computer Science | 3 | 54 |

| Semester 7 | SM451 Mathematical Methods | 8 | 144 |
| SC431 Physical Chemistry | 2 | 36 |
| SC441 Analytical Chemistry | 3 | 54 |
| SC461 Organic Chemistry | 2 | 36 |
| Elective subject (1) | 1 | 18 |
| SA409 Special Project | 4 | 72 |
| BS495 Business Studies | 4 | 72 |

* The elective subjects are listed under Double major in Applied Chemistry.

9 Mathematics/Computer Science

The solution of many problems faced by business, industry and government can be facilitated by use of mathematical and statistical models. The mathematics major concentrates on the operations research approach to problems such as inventory control and resource planning or allocation. Since many operations research and statistical studies result in or use, computer-based systems, this course is complemented by the computer science major.

The computer science major involves the study of algorithms used in the solution of mathematical, engineering and business problems and the implementation of these in a suitable algorithmic or business-oriented language. The work is supplemented during the latter years of the course by studies in logic, programming techniques and systems science.

Full-time course

| Semester 3 | SM251 Mathematical Methods | 8 | 144 |
| SK203 Computer Science | 8 | 144 |
| AT291 Complementary Studies | 2 | 36 |
| SA201 Industrial Case Studies | 2 | 36 |

| Semester 4 | SA209 Work Experience |
| Semester 5 | SA309 Work Experience |

8 Mathematics/Chemistry

As the mathematics major concerns the study of operations research, network analysis, linear programming and statistical analysis, the combination of these with the chemistry major provides the opportunity of linking the managerial and the chemical aspects of the chemical industry. The combination of these mathematical techniques with chemistry also adds further dimension to the study of the industrial applications of chemical processes.
Semester 6
SM351 Mathematical Methods 9 162
SK303 Computer Science 9 162
SA303 Applied Research/Project Management 3 54

Semester 7
SM451 Mathematical Methods 8 144
SK403 Computer Science 8 144
SA409 Special Project 4 72
BS495 Business Studies 4 72

Diplomas of Applied Science (Applied Chemistry) and (Biochemistry)
These courses are for students who require an alternative to the degrees in applied science and they are available for either full-time or part-time study. The full-time courses occupy three years of study. The part-time courses are designed to be completed in six years by students who attend for one afternoon and two evenings per week. To be eligible for the award of a diploma, a minimum of twelve weeks of approved industrial experience must be completed.

Diploma of Applied Science (Applied Chemistry) (1979 syllabus)

Full-time course
First year — common year of the Applied Science full-time course.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours Week</th>
<th>Hours Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC266</td>
<td>Organic Chemistry</td>
<td>7</td>
<td>210</td>
</tr>
<tr>
<td>SC246</td>
<td>Analytical Chemistry</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>SC247</td>
<td>Applied Analytical Chemistry</td>
<td>4</td>
<td>120</td>
</tr>
<tr>
<td>SC236</td>
<td>Physical Chemistry</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>SC227</td>
<td>Applied Physical Chemistry</td>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>SC207</td>
<td>Chemical Process</td>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>AT292</td>
<td>Social Science</td>
<td>2</td>
<td>60</td>
</tr>
</tbody>
</table>

Second year
SC366 | Applied Organic Chemistry 5 150
SC346 | Applied Analytical Chemistry 5 150
SC336 | Applied Physical Chemistry 6 180
SC307 | Inorganic Manufacturing Industries 1 30
SC308 | Organic Manufacturing Industries 1 30
BS395 | Managerial Economics 3 90
AT392 | Report Writing 1 30

Part-time course
To be eligible for the reduced hours of practical work prescribed for this course, a student must be in approved full-time employment.

First year — semesters 1 and 2 of the common years of the Applied Science part-time course.
Second year — semesters 3 and 4 of the common years of the Applied Science part-time course.

Certificate in Chemistry
Students undertaking the course towards a diploma in applied chemistry may, by completion of appropriate diploma subjects, qualify for the award of a certificate. Details of the subjects required for a certificate are available from the faculty secretary.

Diploma of Applied Science (Biochemistry) (1979 syllabus)

Full-time course
First year — common year of the Applied Science full-time course.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours Week</th>
<th>Hours Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC266</td>
<td>Organic Chemistry</td>
<td>5</td>
<td>150</td>
</tr>
<tr>
<td>SC246</td>
<td>Analytical Chemistry</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>SC256</td>
<td>Inorganic Chemistry</td>
<td>1</td>
<td>30</td>
</tr>
</tbody>
</table>

Second year
SC367 | Organic Chemistry 5 150
SC387 | Physical Biochemistry 5 150
SC386 | Biochemistry 8 240
SC376 | Microbiology 5 150
AT392 | Report Writing 1 30

Part-time course
For appropriate students a reduction in the hours of practical work may be approved.

First year
Semesters 1 and 2 of the common years of the Applied Science part-time course.

Second year
Semesters 3 and 4 of the common years of the Applied Science part-time course.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours Week</th>
<th>Hours Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC236</td>
<td>Physical Chemistry</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>SC246</td>
<td>Analytical Chemistry</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>SC256</td>
<td>Inorganic Chemistry</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>SC266</td>
<td>Organic Chemistry</td>
<td>5</td>
<td>150</td>
</tr>
</tbody>
</table>
All students of the diploma courses in applied chemistry and biochemistry who are not undertaking their course in a standard format are required to study the subjects in an approved order, in accordance with the following table:

<table>
<thead>
<tr>
<th>First year</th>
<th>Second year</th>
<th>Third year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>Physical chemistry</td>
<td>* Physical chemistry</td>
</tr>
<tr>
<td>Physics</td>
<td>Analytical chemistry</td>
<td>* Analytical chemistry</td>
</tr>
<tr>
<td>Physical chemistry</td>
<td>Inorganic chemistry</td>
<td>* Physical biochemistry</td>
</tr>
<tr>
<td>Analytical chemistry</td>
<td>Physiology</td>
<td>* Microbiology</td>
</tr>
<tr>
<td>Inorganic chemistry</td>
<td>* Biochemistry</td>
<td>* Biochemistry</td>
</tr>
<tr>
<td>Biology</td>
<td>* Organic chemistry</td>
<td>Report writing</td>
</tr>
<tr>
<td>Organic chemistry</td>
<td>Chemical processes</td>
<td>* Inorganic manuf. industries</td>
</tr>
<tr>
<td>* Numerical methods</td>
<td>* Social science</td>
<td>* Organic manuf. industries</td>
</tr>
<tr>
<td>* Computer Science</td>
<td></td>
<td>* Managerial economics</td>
</tr>
</tbody>
</table>

Explanatory notes:
1 Subjects in a higher year may not be studied unless all subjects in the lower year(s) have either been passed or are being studied concurrently.
2 Subjects must be studied in the vertical order shown except those marked * which may be studied at any time within their own year.
3 Subjects in different years connected by arrows may not be studied concurrently.
4 Part-time first year students should study physical and analytical chemistry in one year and inorganic and organic chemistry in a subsequent year.
5 † Report writing may not be attempted unless concurrently with or after completion of four other subjects of the third year.
Diploma of Applied Science (Environmental Health) (1976 syllabus)

This takes the form of a three-and-a-half year program of cooperative education in which students attend the institute for a total of five semesters and gain practical work experience for two semesters.

**Full-time course**

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SC181 Biology</td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>SC191 Chemistry</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>ED101 Engineering Drawing and Sketching</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>SM121 Mathematics</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>SP111 Physics</td>
<td>5</td>
<td>75</td>
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<tr>
<td>AT191 Health and Society</td>
<td>2</td>
<td>30</td>
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</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SC182 Biology</td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>SC192 Chemistry</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>ED102 Engineering Drawing and Sketching</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>BS192 Introductory Law</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>SM122 Mathematics</td>
<td>1</td>
<td>15</td>
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<tr>
<td>SP112 Physics</td>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>AT192 Health and Society</td>
<td>2</td>
<td>30</td>
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<tr>
<td>EA122 Industrial Processes</td>
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<table>
<thead>
<tr>
<th>Semester 3</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SC293 Environmental Science</td>
<td>4</td>
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<tr>
<td>SC283 Microbiology</td>
<td>5</td>
<td>90</td>
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<tr>
<td>EA223 Industrial Chemical Processes</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>CE235 Health Engineering</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>BS293 Law</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>BC210 Building Practices</td>
<td>2</td>
<td>36</td>
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<tr>
<td>CE223 Town and Country Planning</td>
<td>2</td>
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<tr>
<td>SM213 Mathematics</td>
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<table>
<thead>
<tr>
<th>Semester 4</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SA208 Work Experience</td>
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<table>
<thead>
<tr>
<th>Semester 5</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SA308 Work Experience</td>
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<table>
<thead>
<tr>
<th>Semester 6</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SC391 Chemistry</td>
<td>6</td>
<td>108</td>
</tr>
<tr>
<td>SC384 Microbiology</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>SC385 Epidemiology</td>
<td>3%</td>
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</tr>
<tr>
<td>EA321 Industrial Processes</td>
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</tr>
<tr>
<td>BS390 Law</td>
<td>3%</td>
<td>63</td>
</tr>
<tr>
<td>ME349 Environmental Engineering</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>SC311 Seminars, visits, etc.</td>
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<td>36</td>
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</table>

<table>
<thead>
<tr>
<th>Semester 7</th>
<th>Hours</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>EA421 Industrial Processes</td>
<td>4</td>
<td>72</td>
</tr>
<tr>
<td>BS497 Office Systems and Administration</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>SC402 Environmental Health</td>
<td>6</td>
<td>108</td>
</tr>
<tr>
<td>CE401 Health Engineering</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>ME449 Environmental Engineering</td>
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<td>54</td>
</tr>
<tr>
<td>SC411 Seminars, visits, etc.</td>
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</tr>
<tr>
<td>BS499 Law</td>
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<table>
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<tbody>
<tr>
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<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SC391 Chemistry</td>
<td>6</td>
<td>108</td>
</tr>
<tr>
<td>SC384 Microbiology</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>EA321 Industrial Processes</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>SC311 Seminars, visits, etc.</td>
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<td>36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 9</th>
<th>Hours</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
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<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>SC402 Environmental Health</td>
<td>6</td>
<td>108</td>
</tr>
<tr>
<td>CE401 Health Engineering</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>ME449 Environmental Engineering</td>
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<td>54</td>
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<table>
<thead>
<tr>
<th>Semester 10</th>
<th>Hours</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>EA421 Industrial Processes</td>
<td>4</td>
<td>72</td>
</tr>
<tr>
<td>BS497 Office Systems and Administration</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>SC411 Seminars, visits, etc.</td>
<td>3½</td>
<td>63</td>
</tr>
<tr>
<td>BS499 Law</td>
<td>3½</td>
<td>63</td>
</tr>
</tbody>
</table>

**Part-time course**

The part-time course is designed so that the academic work may be completed in five years, by students who attend for twelve hours (one afternoon and two evenings) per week.

In addition to the academic work listed below, part-time students are required to include SA208 Work Experience and SA308 Work Experience in their course. Normally students who are in relevant full-time employment enrol in SA208 along with the subjects of the seventh semester and SA308 along with the subjects of the eighth semester.
Graduate Diploma in Applied Colloid Science
This course is for graduates with a background in chemistry who have a professional interest in the application of colloid science to industrial problems.

The program includes a variety of topics designed to cover the requirements of a wide range of industries. It comprises a compulsory core of lectures and associated practical work which acquaint the student with the fundamental properties of colloids and interfaces, followed by a series of elective subjects.

The program is a two year part-time course, the time-table specifying eight hours per week for four fifteen-week semesters.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>Semester 1</td>
<td>SC530</td>
<td>Properties of Colloids</td>
</tr>
<tr>
<td>Semester 2</td>
<td>Elective subject</td>
<td>8</td>
</tr>
<tr>
<td>Semester 3</td>
<td>Elective subject</td>
<td>8</td>
</tr>
<tr>
<td>Semester 4</td>
<td>Elective subject</td>
<td>8</td>
</tr>
</tbody>
</table>

* The elective subjects are chosen from the following list:
  - SC531 Colloid Experimental Techniques
  - SC532 Emulsion Technology
  - SC533 Polymer Flocculation
  - SC534 Mineral Processing Chemistry
  - SC535 Detergency
  - SC536 Surface Coatings
  - SC537 Corrosion and Protection of Metals

These subjects will not all be offered in any one year. Their availability will be determined by student demand. The list may be augmented to meet students’ requirements.

Graduate Diploma in Biomedical Instrumentation
This course is intended for graduates or diplomates working in the biomedical field whose previous training has not equipped them to appreciate or to use fully the techniques at their disposal. While the course establishes a foundation in general instrumentation and quantitative techniques, its orientation is predominantly biomedical.

The program is designed as a two year part-time evening course, although a longer period may be taken if desired. The time-table specifies eight hours per week for four fifteen week semesters.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>Semester 1</td>
<td>SP511</td>
<td>Measurement Principles</td>
</tr>
<tr>
<td></td>
<td>SP512</td>
<td>Transducers</td>
</tr>
<tr>
<td></td>
<td>SP513</td>
<td>Instrumental Practice</td>
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<tr>
<td></td>
<td>EE420</td>
<td>Devices and Circuits</td>
</tr>
<tr>
<td>Semester 2</td>
<td>SP514</td>
<td>Instrument Electronics</td>
</tr>
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<td></td>
<td>EE421</td>
<td>Digital Techniques</td>
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<tr>
<td>Semester 3</td>
<td>SP515</td>
<td>Signal Processing and Display</td>
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<td></td>
<td>SP516</td>
<td>Project</td>
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<tr>
<td></td>
<td>SP517</td>
<td>Cardio-vascular Monitoring</td>
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<tr>
<td></td>
<td>EE520</td>
<td>Programming Dedicated Processors</td>
</tr>
<tr>
<td>Semester 4</td>
<td>SP518</td>
<td>Neurological Monitoring</td>
</tr>
<tr>
<td></td>
<td>SP519</td>
<td>Respiratory Monitoring</td>
</tr>
<tr>
<td></td>
<td>SP520</td>
<td>Biological Imaging Techniques</td>
</tr>
<tr>
<td></td>
<td>SP521</td>
<td>Project</td>
</tr>
</tbody>
</table>

Graduate Diploma in Computer Simulation
The course is intended for graduates in engineering, applied science, environmental and biological sciences or economics, who have a professional interest in mathematical modelling and simulation. It is also suitable for recent graduates in appropriate disciplines who wish to gain theoretical knowledge and practical experience of these techniques.

The program is designed as a two-year part-time course, although a longer period may be taken if desired, the time-table specifying eight hours per week. It is expected that applicants will have a knowledge of mathematics and statistics at tertiary level. In some cases a preliminary unit in mathematical methods may be prescribed.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>week</td>
<td>semester</td>
</tr>
<tr>
<td>Semester 1</td>
<td>SK512</td>
<td>Digital Simulation Languages</td>
</tr>
<tr>
<td></td>
<td>SK513</td>
<td>Computer Techniques — Digital</td>
</tr>
<tr>
<td></td>
<td>SM511</td>
<td>Mathematical Simulation Techniques</td>
</tr>
<tr>
<td>Semester 2</td>
<td>SK511</td>
<td>Methodology of Simulation</td>
</tr>
<tr>
<td></td>
<td>SK514</td>
<td>Computer Techniques — Analogue</td>
</tr>
<tr>
<td></td>
<td>SM512</td>
<td>Mathematical Simulation Techniques</td>
</tr>
</tbody>
</table>
Graduate Diploma in Industrial Microbiology

The course is intended for graduates or diplomas in chemistry, biochemistry or engineering who have little or no previous knowledge of microbiology. It provides appropriate training in microbiology for professional industrial staff.

The program is designed as a two year part-time course, the time-table specifying seven hours (two evenings) per week for four fifteen-week semesters.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
<th>Semester 2</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>SC511 Basic Microbiology</td>
<td>12</td>
<td>SC512 Microbial Physiology</td>
<td>24</td>
</tr>
<tr>
<td>SC513 Microscopy</td>
<td>9</td>
<td>SC517 Laboratory Safety and Design</td>
<td>12</td>
</tr>
<tr>
<td>SC515 Disinfection and Sterilisation</td>
<td>12</td>
<td>SC518 Survey of Applied Microbiology</td>
<td>9</td>
</tr>
<tr>
<td>SC516 Infectivity and Host Responses</td>
<td>12</td>
<td>SC519 Practical Work</td>
<td>60</td>
</tr>
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</table>

Semester 3

<table>
<thead>
<tr>
<th>Hours</th>
<th>Semester 4</th>
<th>Hours</th>
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<tbody>
<tr>
<td>7</td>
<td></td>
<td></td>
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<tr>
<td>SC520 Microbial Growth</td>
<td>24</td>
<td>SC524 Microbiological Assay</td>
</tr>
<tr>
<td>SC521 Microbial Enzymes</td>
<td>12</td>
<td>SC525 Biodeterioration/Waste Treatment</td>
</tr>
<tr>
<td>SC522 Applied Microbial Genetics</td>
<td>9</td>
<td>SC526 Industrial Fermentations</td>
</tr>
<tr>
<td>SC523 Practical Work</td>
<td>60</td>
<td>SC527 Microbiological Monitoring</td>
</tr>
<tr>
<td>SC528 Project Work</td>
<td>60</td>
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</tbody>
</table>

Graduate Diploma in Scientific Instrumentation

The course is primarily intended for graduates and diplomas in a scientific or engineering discipline who are working in a chemical or biochemical area and require a detailed knowledge of the design, construction and operation of modern laboratory instrumentation.

The program is designed as a two year part-time course, the time-table specifying eight hours (two evenings) per week for four fifteen-week semesters.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
<th>Semester 2</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>SP511 Measurement Principles</td>
<td>10</td>
<td>SP514 Instrument Electronics</td>
<td>50</td>
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<tr>
<td>SP512 Transducers</td>
<td>20</td>
<td>EE421 Digital Techniques</td>
<td>70</td>
</tr>
<tr>
<td>EE420 Devices and Circuits</td>
<td>60</td>
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<tr>
<td>SP513 Instrumental Practice</td>
<td>30</td>
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Semester 3

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<tr>
<th>Hours</th>
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<tr>
<td>8</td>
<td></td>
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<tr>
<td>SP515 Signal Processing and Display</td>
<td>30</td>
<td>SC503 Specific Instruments</td>
</tr>
<tr>
<td>SF522 Optical Systems</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>EE520 Programming Dedicated Processors</td>
<td>40</td>
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</tr>
</tbody>
</table>
Applied Science subject details
Subject codes are listed in numerical order within the following groups:

<table>
<thead>
<tr>
<th>Code</th>
<th>Department or Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>Applied Science</td>
</tr>
<tr>
<td>SC</td>
<td>Chemistry</td>
</tr>
<tr>
<td>SK</td>
<td>Computer Studies</td>
</tr>
<tr>
<td>SM</td>
<td>Mathematics</td>
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<tr>
<td>SP</td>
<td>Physics</td>
</tr>
<tr>
<td>AT</td>
<td>Arts</td>
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<tr>
<td>BC</td>
<td>Building Construction</td>
</tr>
<tr>
<td>BS</td>
<td>Business</td>
</tr>
<tr>
<td>CE</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>EA</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>ED</td>
<td>Engineering Drawing</td>
</tr>
<tr>
<td>ME</td>
<td>Mechanical Engineering</td>
</tr>
</tbody>
</table>

SA201 Industrial Case Studies
Two hours per week for one semester
A second year subject in the full-time degree courses in applied science except for students majoring in chemistry combined with computer science or instrumental science.
This course will introduce the student to real industrial problem-solving by means of case studies and relevant literature (e.g. professional journals).
The student will, in general, look at problems related to major subjects and the implementation of their solutions in a real situation.
Strong emphasis will be placed on communication skills and to this purpose students will be expected to present both written and verbal reports on their work.

SA208 Work Experience
A six-month period of work experience occurring as part of the second year of the course leading to the Diploma of Applied Science (Environmental Health). Students are supervised by a member of the academic staff, and are required to submit a report to their employer and to their supervisor.

SA209 Work Experience
A six-month period of work experience occurring as part of the second year of the course leading to the Degree of Bachelor of Applied Science. Students are supervised by a member of the academic staff and are required to submit a report to their employer and to their supervisor.

SA301 Clinical Experience
A six-month period of hospital or industrial work experience occurring as part of the third year of the course leading to the Degree of Bachelor of Applied Science for those students majoring in biophysics. Students are supervised by a member of the academic staff and are required to submit a report to their employer and to their supervisor.

SA302 Clinical Experience
A six-month period of hospital or industrial work experience occurring as part of the third year of the course leading to the Degree of Bachelor of Applied Science for those students majoring in biophysics. Students are supervised by a member of the academic staff and are required to submit a report to their employer and to their supervisor.

SA303 Applied Research/Project Management
Four hours per week for one semester.
Prerequisite: satisfactory completion of the first five semesters of the course.
A compulsory sixth semester subject in the degree course in applied science for students majoring in mathematics and computer science.
The subject comprises individually and/or group assigned work and involves oral and/or written presentation in the area of applied research and project management.

References

SA308 Work Experience
A six-month period of work experience occurring as part of the third year of the course leading to the Diploma of Applied Science (Environmental Health). Students are supervised by a member of the academic staff and are required to submit a report to their employer and to their supervisor.

SA309 Work Experience
A six-month period of work experience occurring as part of the third year of the course leading to the Degree of Bachelor of Applied Science. Students are supervised by a member of the academic staff, and are required to submit a report to their employer and to their supervisor.

SA409 Special Project
Four hours per week for one semester.
Prerequisite: satisfactory completion of the first three years of the course.
A compulsory final year subject in the degree course in applied science (except for the double major in applied chemistry).
The subject comprises individually assigned work and may involve practical work and/or a written assignment in an area considered necessary for completion of the course.

SC131/132 Physical Chemistry
SC131 One hour of theory per week for two semesters plus practical work.
A compulsory subject in the common first year of the degree/diploma of applied science.
Electronic structure of atoms (wave-particle duality; energy levels; shapes of atomic orbitals).
Thermodynamics. The first, second and third laws, culminating in a discussion of free energy as a criterion of spontaneity and chemical equilibrium.
Chemical kinetics. Rate laws governing zero, first and second order reactions; simple reaction mechanisms.

Preliminary reading

References (* strongly recommended)
* Mahan, B.H. University Chemistry. 3rd edn, Reading, Mass, Addison-Wesley, 1975

AS16
Moore, W.J. Physical Chemistry. 5th edn, Lond., Longman, 1972

SC141/ Analytical Chemistry
SC142 One hour of theory per week for two semesters plus practical work
A compulsory subject in the common first year of the degree/diploma of applied science.
A study of acid-base, sparingly soluble salt, complexion, and redox equilibria provides a theoretical basis for selected aspects of practical analytical chemistry as well as an aid to the understanding of chemical equilibrium. Applications of the theory will be illustrated throughout the chemistry practical course.

Preliminary reading

Recommended text

References
Fritz, J.S. and Schenk, G.H. Quantitative Analytical Chemistry. 3rd edn, Boston, Allyn & Bacon, 1974

SC151/ Inorganic Chemistry
SC152 One hour of theory per week for two semesters plus practical work
A compulsory subject in the common first year of the degree/diploma of applied science.

Topic 1: chemical bonding and structure.
Treatment of major chemical bond types, viz. ionic, covalent, metallic and intermolecular.
Structure of ionic compounds, metals, polyatomic ions and molecules.
Throughout the topic the correlation between bond type and properties of compounds and elements will be emphasised.

Topic 2: chemistry of the elements.
The physical properties and thermodynamics of the elements are used extensively to discuss the behaviour of the elements with a view to understanding the important factors in determining the oxidation states adopted, the redox properties exhibited, the formation of compounds, the extraction of the elements, and the range of allotropic forms. Industrial uses of most of the elements are considered with emphasis on those of most importance.

References
There is no one reference suitable for Inorganic SC151/2. The references listed below will be referred to throughout the lecture course.

SC171/ Biology
SC172 Four hours of theory and practical work per week for two semesters
A compulsory subject in the common first year of the degree/diploma in applied science.
The course provides an introduction to the biological world and a background for subsequent subject areas in applied biochemistry and biophysics majors. The course involves an integrated study of cell biology, genetics, microbes, plants and animals, ecology, evolution and an introduction to biochemistry.

SC181 Biology
Four hours of theory and two hours of practical work per week for one semester
A first year subject in the diploma course in applied science (environmental health).
A course which covers the basic elements of human biology listed below.


Introduction to hormones.

Basic principles of the functioning of cardio-vascular, respiratory, digestive, excretory, reproductive and nervous systems. Sense organs.

References
For details concerning prescribed text book, references, etc. consult the lecturer.

SC182  Biology
Four hours of theory and two hours of practical work per week for one semester
A first year subject in the diploma course in applied science (environmental health).
A course which covers the fundamental elements of environmental biology listed below.
Genetics: structure and importance of gene and chromosome
Mutation: variation applied to human populations.
Evolution: taxonomic principles applied to plant, animal and protista kingdoms. Causes and processes of evolution. Main evolutionary lines using selected examples of importance to public health.
Ecology: eco-systems; energy chains, food chains and food webs and their relationships to mammalian activity and function. Pollution and its effect on eco-systems.

Prescribed text book
No single book covers the areas taught to sufficient depth. Students will be referred to specific references during the course.

SC191  Chemistry
Two hours of theory and three hours of practical work per week for one semester
A first year subject in the diploma course in applied science (environmental health).

Atomic and molecular structure: the names, symbols, electronic configurations of the more commonly encountered elements with their environmental significance being stressed.

Ionic and covalent bonding. Structures of solids.

Chemical periodicity: atomic structure related to chemical properties. Periodicity of chemical properties related to periodicity of atomic structure. Trends within the periodic table.


Equilibrium: solubility and ionic equilibrium.

Preliminary reading
Dickson, T.R. - Introduction to Chemistry. 2nd edn, N.Y., Wiley, 1975

SC192  Chemistry
Two hours of theory and three hours of practical work per week for one semester
A first year subject in the diploma course in applied science (environmental health).

Equilibrium: Corrosion and pH.

Kinetics: Reaction rates, equilibrium, chain reactions, half-life, radioactivity.


Co-ordination chemistry: complex formation. Importance of complexes in analysis, industry and living systems.

SC207  Chemical Processes
Two hours per week for two semesters
A subject in the second year of the diploma of applied science (applied chemistry).

Thermodynamics of the extraction of metals. Co-ordination chemistry related to ion exchange, solvent extraction and catalysis. Thermal and catalytic cracking. Fuels and combustion.

A study of the main chemical and physical factors underlying the design of the major types of industrial equipment including transportation, heat transfer, drying, separation and measuring. There will be at least one visit to an industrial plant.

References
Selinger, B. - Chemistry in the Market Place. Canberra, ANU, 1975

SC213  Chemical Process Industries
One hour per week for one semester.

Prerequisite, completion of the common first year.

An elective subject in the second or subsequent year of the degree courses for students majoring in chemistry.

The course consists of a detailed study of a number of the most important chemical processes, and a general study of the overall industrial situation.

The course is constructed on a seminar basis with discussion groups, readings and films.

There is an assignment and students are offered the opportunity to participate in an appropriate excursion.

References
Selinger, B. - Chemistry in the Market Place. Canberra, ANU, 1975

SC223  Analysis of Organic Compounds
One hour of theory/practical work per week for one semester.

Prerequisite, completion of the common first year.

An elective subject in the second or subsequent year of the degree courses for students majoring in chemistry.

This course reviews or introduces techniques commonly used to isolate and identify organic compounds which are not covered elsewhere in this semester. Emphasis is placed on applying such techniques and developing an awareness of situations in which each could be applied successfully. At least six hours are devoted to practical sessions during which a selection of the techniques is used.
SC231 Physical Chemistry
Two hours of theory per week for one semester plus practical work
Prerequisite, completion of the common first year
A second year subject for degree students majoring in chemistry.
Spectroscopy: some basic principles. Infrared spectra, including a detailed study of the spectra of classes of organic compounds. Quantitative analysis using atomic absorption and atomic emission methods.
Thermodynamics: effect of temperature (T) upon AH and AG for reactions; variation of K with T; efficiencies of reversible and irreversible processes; chemical potential.
Phase Equilibria: The phase rule.
One component systems: Clausius-Clapeyron equation, vacuum distillation;
Two component systems: (a) binary liquid mixtures, Raoult's law, Henry's law, fractional distillation, steam distillation (b) solid-liquid equilibria, cooling curves, fractional crystallisation, zone refining, (c) solid-vapor equilibria.
Three component systems: introduction to.

References

SC233 Applied Physical Chemistry
One hour of theory per week for one semester plus practical work
Prerequisite, completion of the common first year
A second year subject for degree students majoring in applied chemistry.
Spectroscopy: more basic principles. The rationale behind infra-red spectra. The UV/visible spectra of molecules.

References

SC236 Physical Chemistry
Two hours of theory per week for two semesters plus practical work
Prerequisites, SM151, SM152, SP101, SP102, SC131, SC132
A second year subject in the diploma courses in applied science (applied chemistry) and (biochemistry).
Thermodynamics
Continuation and some revision of 1st year. The effects of temperature on the enthalpy and free energy changes for reactions, variations of equilibrium constant with temperature. Chemical potentials.
Phase equilibria
The phase rule. P-T phase diagrams for one-component systems, Clausius and Clausius — Clapeyron equations, Trouton's rule, vacuum distillation. Two-component systems, lever rule.
(a) binary liquid mixtures, T vs. X relationships, fractional distillation; complete miscibility, partial miscibility and immiscibility, solvent extraction, salting-out and steam distillation.
(b) solid-liquid equilibria. T-X diagrams, recrystallisation, miscibility in solid state, fractional crystallisation and zone refining.
(c) solid-vapor equilibria.
Colligative properties.
Kinetics
Brief revision of 1st year kinetics, experimental methods, elucidation of rate laws, complex reaction mechanisms, steady state approximation. Arrhenius equation, qualitative introduction to transition state theory.
Electrochemistry
(a) Electrical conductance and conductivity of electrolyte solutions, strong and weak electrolytes, ionic atmosphere effects. High mobility of H+ and OH—. Transference numbers.
(b) Equilibrium electrochemistry: sign conventions for cells, potentiometric determination of EMF, liquid junction potentials, cells without liquid junction potentials (incl. salt bridges), thermodynamics of cells. Specific ion electrodes: glass, solid state, liquid membrane, sensitivity, applications and advantages, limitations.
(c) Working cells/non-electrochemistry: structure of the double layer, importance, adsorption, measurement of overpotentials.
Charge transfer kinetics, Butler-Volmer equation and special cases thereof, sign of overpotential. Tafel equation and multistep reactions. Significance of the exchange current density.
Mass transport in cells: diffusion, convection and migration. Limiting currents and importance to electroanalytical methods. Functioning of complete cell: dissipation of cell voltage in overpotentials and IR drop.
Fuel cells and batteries, characteristics and differences, variety of, efficiencies of, comparison with internal combustion engines, electric cars.
Chromatography
The chromatographic separation process. Techniques and applications for column, gas, paper, thin layer and gel filtration chromatography.

Reference
SC237  **Applied Physical Chemistry**
One hour of theory per week for two semesters plus practical work
Prerequisites, SM151, SM152, SP101, SP102, SC131, SC132
A second year subject in the diploma course in applied science (applied chemistry).

Solid state chemistry
(i) the band theory of solids. The nature of amorphous solids. Liquid crystals.
(ii) defect structures and interactions. The elements of nucleation theory.
(iii) applications of (i) and (ii) to, for example, tarnish reactions, sintering and photographic processes.

Rheology
the study of the deformation and flow of matter.
(i) the behaviour of simple liquids, dilute and concentrated suspensions under the action of shear forces.
(ii) a study of time-dependent phenomena, e.g. thixotropy and rheopexy.
(iii) experimental methods for measuring rheological behaviour.

The non-ideal behaviour of solutes. Activities and activity coefficients, experimental determination and calculation of chemical processes in solution.

SC246  **Analytical Chemistry**
One hour of theory per week for two semesters plus practical work
Prerequisites, SC141, SC142
A second year subject in the diploma courses in applied science (applied chemistry) and (biochemistry).

The basic spectrometer, the spectrum and the interpretation of characteristic frequencies, peak widths and intensities. The vibrational (infrared) spectra of molecules. The electronic (UV/visible) spectra of atoms and molecules.

Chelometry
Gravimetry
Sampling and quality control
Obtaining a representative sample of solids, liquids and gases. Sample preparation.
Application of statistical methods for routine checking of analytical techniques and for monitoring product quality.

Acid/base properties in non-aqueous solvents

Microanalysis

References

SC247  **Applied Analytical Chemistry**
One hour of theory per week for two semesters plus practical work
Prerequisites, SC141, SC142
A second year subject in the diploma course in applied science (applied chemistry).

The basic analyser — 15 structure and frequency response. Operational amplifiers and their use for amplification, for the control of chemical experiments and for analogue computing. Pen recorders and other output systems, including integrators. Scope and application of electroanalytical chemistry. Controlled-potential vs. controlled-current techniques and instrumentation — application to coulometry. Solvents and supporting electrolytes, reference electrodes, types of indicator electrode material.

Limiting currents and the general voltammetric technique — stirred and unstirred solutions, indicator electrodes rotating and stationary cells.

DC polarography and its extension to advanced polarographic techniques.

Stripping analysis.

Diffraction, fluorescence and absorption spectroscopy.

Reference

SC251  **Inorganic Chemistry**
Two hours of theory per week for one semester, plus practical work
Prerequisite, completion of the common first year

A second year subject for degree students majoring in chemistry.

Topic 1: periodic chemistry of selected compounds. The periodic variation of the properties of oxides, hydroxides, fluorides, and hydrides, are discussed for the elements of the second and third periods. Emphasis is placed on the structural variation of the above compounds across periods, the variation in chemical behaviour, and the variation in behaviour with bond type. The ideas developed are extended to the compounds of the remaining group VI and VII elements, aspects of solubility of those compounds also being considered. The concepts developed for the main group elements are applied also to the transition metal elements and the lanthanides.

References

Topic 2: co-ordination chemistry.


References
Basolo, F. and Johnson, R.C. *Coordination Chemistry*. N.Y., Benjamin, 1964
Orgel, L.E. *An Introduction to Transition Metal Chemistry*. 2nd edn, Lond., Methuen, 1966

SC253  **Applied Inorganic Chemistry**
One hour of theory per week for one semester plus practical work
Prerequisite, completion of the common first year.

A second year subject for degree students majoring in applied chemistry.
Non-metal chemistry; treatment of the chemistry and applications (industrial and environmental) of selected non-metals e.g. nitrogen and phosphorus. The relationship between the chemistry, application and preparation of the elements and their important consumer compounds is emphasised.

References
Toy, A.D.F. *Phosphorus Chemistry in Everyday Living*. Washington, American Chemical Society, 1976

**SC256 Inorganic Chemistry**
One hour of theory per week for two semesters plus practical work
Prerequisites, SC151, SC152
A second year subject in the diploma course in applied science (biochemistry).
A periodic study of the chemistry of the more important compounds, e.g. oxides and hydroxides, halides.
Compounds of transition elements extended to co-ordination chemistry — including naming, structure, stereochemistry, stability and theory thereof, with particular emphasis on the aspects of biochemical importance, e.g. stability of chelates, optical isomerism of complexes and effects of complexing on electron transfer in biochemical systems.
Ion-exchange and radiochemistry; principles and practice with emphasis on biochemical aspects.

References
As for SC251 Inorganic Chemistry

**SC261 Organic Chemistry**
Two hours of theory per week for one semester plus practical work
Prerequisite, completion of the common first year
A second year subject for degree students majoring in chemistry.
This is a basic course in the chemistry of aromatic compounds and includes an introduction to the uses of spectroscopy in organic chemistry. Particular emphasis is given to preparation, reactions, underlying concepts, mechanisms and industrial application.

References
See lecturer in charge.

**SC263 Applied Organic Chemistry**
One hour of theory per week for one semester plus practical work
Prerequisite, completion of the common first year.
A second year subject for degree students majoring in applied chemistry.
A course involving the principles of radical chemistry and photochemistry and their applications.

References
See lecturer in charge.

**SC266 Organic Chemistry**
Three hours of theory per week for two semesters plus practical work
Prerequisites, SC161, SC162
A second year subject in the diploma courses in applied science (applied chemistry) and (biochemistry), taught in an individualised format.
The principles of organic chemistry are extended to aromatic compounds emphasising differences and similarities with aliphatic compounds.
Reactions are reviewed (and extended) according to their type: carbanion reactions, carboxonium ion reactions, additions, substitutions, etc.
General properties of compounds such as acidity, basicity, reactivity and stereochemistry are systematically covered.
Emphasis is given to synthetic pathways and industrially significant reactions.
The applications of instruments in organic analysis is extended to UV and NMR spectroscopy.

**SC271 Microbiology**
Two hours per week for one semester
Prerequisite, completion of the common first year
A second year subject for degree students majoring in applied chemistry or biochemistry.
The course provides an introduction to the biology of microorganisms and to the basic techniques involved in handling micro-organisms. Practical aspects will be integrated with the practical work associated with SC281.
Topics to be covered — microbial anatomy, introduction to microbial systematics, microbial growth and nutrition, sterilisation and antibiotics.

References

**SC276 Physiology**
Five hours per week for two semesters
Prerequisites, SC171, SC172
A second year subject in the diploma course in applied science (biochemistry).
The aim is to present a study of human physiology from the following points of view:
(a) The physico-chemical processes underlying physiological mechanisms
(b) The structure and function of organ systems
(c) The integrated function of organ systems in overall bodily activity
Emphasis is on the following — recording and instrumentation of physiological processes; the cardiovascular system; blood and body fluids; respiration; digestion; the renal system; immunology; endocrinology and reproduction; neurophysiology and psychophysiology.

References
The following topics will be studied:

- acids as fuels; tricarboxylic acid cycle, electron transport and oxidative phosphorylation; protein catalysis, urea cycle; biochemical techniques.

**References**


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**SC281 Biochemistry**

Three hours theory and five hours practical work per week for one semester

Prerequisite, completion of the common first year

A second year subject for degree students majoring in biochemistry.

The following topics will be studied:

Chemistry of biological compounds including an introduction to protein structure; ATP structure and function; enzyme kinetics; metabolism of carbohydrates, glycolysis; fats and fatty acids as fuels; tricarboxylic acid cycle, electron transport and oxidative phosphorylation; protein catalysis, urea cycle; biochemical techniques.

**References**


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**SC283 Microbiology**

Five hours per week for one semester

A second year subject in the diploma course in applied science (environmental health).

The course introduces the students to the biology of viruses, bacteria, fungi and algae with emphasis on the interactions of micro-organisms with organisms, particularly man. The course extends the basic aspects of the biology of the group to roles in diseases of man and of animals and plants of importance to man, as well as to roles in technological processes.

Physical and chemical anatomy: the general features of the physical structure of viruses, prokaryotic and eukaryotic cells. Consideration of structure-function relationships in bacteria, fungi and algae. Special features of chemical composition and macromolecular structure of microbial cells.

Microbial physiology: growth patterns of micro-organisms and methods for measuring growth. Physical parameters affecting growth. Basic features of nutritional categories amongst micro-organisms. Interactions between nutritional groups and the role of these interactions in environmental effects.

Sterilisation and antimicrobial substances: the basic methods used for sterilisation, the choice of method of sterilisation. The mode of action and limitations of chemical disinfectants and antimicrobial compounds used in industry and chemotherapy.

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**SC286 Biochemistry**

Three hours of theory and four hours of practical work per week for two semesters

Prerequisite, SC161, SC162, SC171, SC172

A second year subject in the diploma course in applied science (biochemistry).

A general survey of the chemical compounds and reaction sequences used by living organisms. The metabolic sequences are integrated by emphasising control mechanisms at the kinetic, genetic and hormonal levels.

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**SC293 Environmental Science**

Two hours of theory and two hours of practical work per week for one semester

A second year subject in the diploma course in applied science (environmental health).

This course develops an understanding of the specific scientific principles which have been applied towards the specific tasks of the health surveyor. Considerable emphasis is placed on sanitation, particularly in relation to food and food processing, and the techniques employed in maintaining healthy and hygienic premises.

Food chemistry; food as the basic energy source. Types of foods and suitability for nutritional status. Roles of vitamins and minerals. Metabolism of food. Food processing; principles of food preservation. Heating, cooling, canning, drying and chemical preservation.

Toxicology; biological action and use of the various chemicals introduced for control of insects and vermin of public health importance. Methods of laying baits and contrivances with these chemicals and the hazards involved in their use.

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**SC307 Inorganic Manufacturing Industries**

One hour per week for two semesters

Prerequisite, SC207

A third year subject in the diploma course in applied science (applied chemistry).

**References**

A study of — (i) the chemistry of a selection of the following: S, Si, N, P, Cl and metals, and of their commercially important compounds

(ii) the manufacturing processes involved in the large-scale production of the elements and their consumer compounds.

Rationalisation of the nature, problems and economic aspects of the selected processes in terms of the chemistry of the species concerned. The application of physico-chemical principles, e.g. thermodynamics, kinetics, catalysis, and separation techniques, to plant efficiency — integration of these principles with the basic inorganic chemistry involved.

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**SC308 Organic Manufacturing Industries**

One hour per week for two semesters

Prerequisite, SC207

A third year subject in the diploma course in applied science (applied chemistry).

This subject applies theoretical principles to industrial organic manufacturing. Topics include the properties and manufacture of synthetic polymers and synthesis.

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**SC311 Seminars, visits, etc.**

Thirty-six hours in one semester

A third year subject in the diploma course in applied science (environmental health).

Time is devoted to visiting courts and industrial premises and to discussions inter-relating the various disciplines studied in the course. Problems which students may have encountered during their work experience are discussed.

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**SC313 Environmental Parameters**

One hour per week for one semester

An elective subject in the third or final year of the degree courses for students majoring in chemistry

**Air pollution:**

Types, sources, levels and effects. Smoke and sulphur dioxide — the English experience — the disasters, causes, attenuation, routine monitoring and current warning systems are discussed.

**Photochemical smog:**

Empirical modelling. Modelling and prediction from the study of source intensities, levels and meteorology.
SC316  Electroanalytical Techniques

One hour per week for one semester

An elective subject in the third or final year of the degree courses for students majoring in chemistry.

A study of important electroanalytical (trace) techniques. Emphasis will be placed on the practical aspects of each technique, its area of application, advantages and limitations. Specific techniques studied will include DC polarography and its extension to advanced polarographic techniques, stripping analysis, coulometry, potentiometry and ion selective electrodes.

References
Moody, G.J. and Thomas, J.D.R. Selective Ion Sensitive Electrodes, Watford, Merrow, 1971
Meites, L. Polarographic Techniques, N.Y., Interscience, 1965
Sawyer, T. and Roberts, J.L. Experimental Electrochemistry for Chemists, N.Y., John Wiley and Sons, 1974
Adams, R.N. Electrochemistry or Solid Electrodes, N.Y., Marcel Dekker, 1971
Lingane, J.J. Electroanalytical Chemistry. 2nd edn, N.Y., Interscience, 1966

SC321  Organometallics

One hour per week for one semester

An elective subject in the third or final year of the degree courses for students majoring in chemistry.

The preparation, chemical and physical properties of selected classes of organometalllic compounds are discussed. They are chosen on the basis of current interest and/or industrial, preparative and biological importance. Where appropriate the historical significance and bonding mechanisms of the compounds are presented. Appropriate practical work may be included in the program.

SC324  Technology of Polymers

One hour per week for one semester

An elective subject in the third or final year of the degree course for students majoring in chemistry.

Classification of polymers.
Condensation polymers — kinetics — common condensation polymers — chemistry, production and common uses.
Addition polymers — kinetics — types of initiation — free radical — cationic — anionic — Ziegler-Natta — methods of production — common addition polymers and their uses.

References
Allen, J.A. An Outline of Polymer Chemistry. Edinb., Oliver and Boyd, 1968
Jenkins, A.D. and Liddell, A. eds. Reactivity, Mechanism and Structure in Polymer Chemistry, N.Y., Wiley

SC325  General Polymer Chemistry

One hour of theory per week for one semester

An elective subject in the third or final year of the degree courses for students majoring in chemistry.

The course includes:
Special properties of polymers and their measurement
Polymisation reactions and procedures
Examples of manufacture of industrial polymers.

SC326  Surface Coatings

One hour of theory per week for one semester

An elective subject in the third or final year of the degree courses for students majoring in chemistry.

Topics include:
Applications of protective organic surface coatings
Non-convertible and convertible surface coatings, their chemistry and properties

SC331  Physical Chemistry

Two hours of theory per week for one semester plus practical work

Prerequisite, SC231

A third year subject for degree students majoring in chemistry.


Colloid and surface chemistry; surface thermodynamics.
Surface activity and orientation at interfaces, the Gibbs equation. Spreading of liquids, the nature of insoluble monolayers and their uses. Contact angles and wetting, practical considerations. Detergents, foams and emulsions.

Chromatography; the chromatographic separation process. Adsorption, partition, gel filtration, thin layer, paper and gas chromatography.

References
Adams, R.N. Electrochemistry at Solid Electrodes, N.Y., Marcel Dekker, 1969
Adamson, A.W. Physical Chemistry of Surfaces. 2nd edn, N.Y., Wiley, 1967
Shaw, D.J. Introduction to Colloid and Surface Chemistry. 2nd edn, Lond., Butterworth, 1970

Moore, W.R. An Introduction to Polymer Chemistry. Lond., University of London Press, 1963
Seymour, R.B. Introduction to Polymer Chemistry. N.Y., McGraw-Hill, 1971
Stille, J.K. Introduction to Polymer Chemistry. N.Y., Wiley, 1962

Faculty of Applied Science
SC333  Applied Physical Chemistry  
Two hours of theory per week for one semester plus practical work  
Prerequisites, SC231, SC233  
A third year subject for degree students majoring in applied chemistry.  
Colloid and surface chemistry: origin and description of electrical double layer. Electrokinetic phenomena. Colloid stability and applications.  
Electrochemistry: introduction to and importance of electrochemical kinetics; multi-step electrode reactions; experimental methods applied to important electrochemical reactions.  
References  
As for SC331 Physical Chemistry

SC336  Applied Physical Chemistry  
Two hours of theory per week for two semesters plus practical work  
Prerequisites, SC236, SC237  
A third year subject in the diploma course in applied science (applied chemistry).  
Technological applications of electrochemistry: this unit is an extension of the core unit in electrochemistry in SC236. Application of controlled electrolysis (potentiostatic and galvanostatic) to refining and recovery of metals, treatment of waste, and synthesis. Industrial cells and electrodes — electrocatalysis. The electrochemical nature of corrosion — corrosion inhibition. Battery technology.  
Surface and colloid chemistry: two main topics will be covered in this course with a strong emphasis on applications of the phenomena studied.  
(a) Liquid surfaces — surface and interfacial tensions; surface thermodynamics, adsorption at interfaces; properties of surfactant solutions, the spreading of liquids; insoluble monolayers; contact angles, wetting and detergency.  
(b) Electrical phenomena — the development of charge and potential at interfaces; structure of the electrical double layer; electrokinetic phenomena; colloid stability.  
Kinetics  
(a) Kinetic studies of chemical reactions. Review rate theories of bimolecular gas reactions, thermodynamic formulations of transition state equations.  
(b) Branched chain gas reactions  
(c) Branching chain gas reaction, gas phase autoxidations, reactions in the internal combustion engine, fuels to match high engine compression ratios, exhaust emissions from internal combustion engines and their control, photochemical smog formations, gas reactions in the upper atmosphere, the ozone layer.  
(d) Solution kinetics. Dielectric constant (solvent) and ionic strength effects.  
References  
Adanson, A.W. Physical Chemistry of Surfaces. 2nd edn, N.Y., Wiley, 1967  
Shaw, D.J. Introduction to Colloid and Surface Chemistry. 2nd edn, Lond., Butterworths, 1970

SC346  Applied Analytical Chemistry  
One hour of theory per week for two semesters plus practical work  
Prerequisites, SC246, SC247  
A third year subject in the diploma course in applied science (applied chemistry). Nuclear magnetic resonance spectroscopy; chemical shift, integrated area, first and second order splitting patterns, magnetic equivalence, rate and time considerations, the analysis of spectra and instrumentation. Mass spectrometry; instrumentation. Applications will include qualitative analysis and fragmentation reactions.  
Gas chromatography — mass spectrometry; direct connection of the mass spectrometer to the chromatograph using separators. Applications of GC — MS  
Data processing. Automatic chemical analysers. Process analysers, including the gas chromatograph, oxygen, infra-red and moisture analysers, and trace gas analysers. The use of process analysers in process control systems.  
References  

SC351  Inorganic Chemistry  
Two hours of theory per week for one semester plus practical work  
Prerequisite, SC251  
A third year subject for degree students majoring in chemistry.  
References  
Carswell, D.J. Introduction to Nuclear Chemistry. Amsterdam, Elsevier, 1967  
Ion exchange and solvent extraction; the principles of both techniques are discussed to a sufficient level to allow application in a practical situation. Applications are discussed in industrial, laboratory and biochemical situations, particular reference being made to the isolation and separation of the rare earths, actinides, and some transition metals.
SC361  Organic Chemistry
Two hours of theory per week for one semester
plus practical work
Prerequisite, SC261

The third year subject for degree students majoring in chemistry.

This is a course in fundamental organic chemistry extending previous principles to polyfunctional molecules. Particular emphasis will be given to acidity and basicity, carbonium ions and syntheses involving these compounds.

References

SC366  Applied Organic Chemistry
One hour of theory per week for two semesters
plus practical
Prerequisite, SC266

A third year subject of the diploma course in applied science (applied chemistry).

A study of the heterocyclic compounds of nitrogen, oxygen and sulphur, the organic chemistry of other elements, and photochemistry.

SC367  Organic Chemistry
Two hours of theory per week for two semesters
plus practical work
Prerequisite, SC266

A third year subject of the diploma course in applied science (biochemistry).

The course extends basic principles studied in earlier years to more complicated systems. Topics covered include heterocyclics, macromolecules, organosilicon and phosphorus compounds, photochemistry and synthesis.

SC368  Biochemistry
Five hours of theory and nine hours of practical work per week for two semesters
Prerequisites, SC281, SC261

A third year subject for degree students majoring in biochemistry.

The course deals with anabolic pathways emphasising their control and co-ordination. The practical course will enable the student to apply a wide range of techniques to specific biochemical problems.

Topics covered include the following:
- Mechanism of oxidative phosphorylation, pentose phosphate pathway, photosynthesis, gluconeogenesis, fatty acid and lipid biosynthesis, membrane structure.
- Biosynthesis of glycosidic linkages, porphyrins, steroids, purines, pyrimidines, proteins and nucleic acids.
- Metabolic regulation mechanisms.
- Biochemical techniques.
- Protein chemistry.
- Endocrinology.

References
Lehninger, A.L. Biochemistry. 2nd edn, N.Y., Worth, 1975

(Additional references and reading materials will be specified during the course.)
SC384 Microbiology
Three hours per week for one semester
Prerequisite, SC283
A third year subject in the diploma course in applied science (environmental health).
A study of applied microbiology.

SC385 Epidemiology
Sixty-three hours in one semester
A third year subject in the diploma course in applied science (environmental health).
A study of infectious diseases of man and animals, vectorial agents in disease transmission, the recognition and methods of control of epidemics, and special infections.

SC386 Biochemistry
Three hours of theory and five hours of practical work per week for two semesters
Prerequisites, SC286, SC266, SC236
A third year subject in the diploma course in applied science (biochemistry).
The course comprises —
Biochemical techniques and methodology; chromatography; electrophoresis; extraction; gaseous exchange; automated analyses; microscopy; preparation of subcellular fractions; radio-isotopes and immunological techniques.
Hormonal control in mammalian biochemistry; chemistry of the brain; nervous system; muscle; liver; adipose tissue, adenohypophysis and other selected organs. Control of metabolism in each of these tissues by means of hormonal mechanisms.
Protein and enzyme chemistry; classification; quantitative estimations; fractionation and purification; determination of primary sequence; intra-and-inter-molecular forces in proteins; conformational analysis; denaturation; mechanisms of catalysis; evolution; control mechanisms at the level of protein structure.
Biochemical genetics: the genetic control of protein structure; structure and function of the nucleic acids; inborn errors of metabolism.
Photosynthesis: pigments; calvin cycle; C4, dicarboxylic acid cycle; photorespiration; the chloroplast.
Clinical chemistry: instrumentation and analyses applicable to clinical diagnosis.

SC387 Physical Biochemistry
Two hours of theory and three hours of practical work per week for two semesters
Prerequisite, SC236
A third year subject in the diploma course in applied science (biochemistry).
The aim of this subject is to give an understanding of the basic theory of several techniques and to apply these to biochemical problems. Topics covered include molecular weight determination, optical rotatory dispersion, X-ray crystallography, spectroscopy and enzyme kinetics.
Reference

SC391 Chemistry
Six hours per week for one semester
Prerequisites, SC191, SC192
A third year subject in the diploma course in applied science (environmental health).
A study of the application of chemical principles to the environment. Topics include sampling techniques, the principles of analytical instruments, the constituents of household substances, the main constituents of soils, water treatment, identification of pollutants in air, water, soil and food, waste disposal.

SC401 Soil Chemistry
One hour per week for one semester.
An elective subject in the final year of the degree courses for students majoring in chemistry.
Soil constituents
Primary silicate minerals in parent material and soils.
Secondary minerals in the soil with emphasis on the types of clay minerals and the chemical and physical implications of the soil colloidal fraction.
Soil processes
The emphasis is on practical applications relevant to plant nutrition and agricultural management of soils in general.
Chemical factors relating to the maintenance or obtaining of desirable soil physical properties; significance of ionic equilibria in soil and cation exchange capacity illustrated with field data; the chemical basis of soil pH and its nutritional importance, chemical aspects of necessary plant nutrient elements in the soil with particular emphasis on nitrogen, phosphorus, potassium and the micronutrients; soil organic matter; saline soils; trends in fertilizer usage.
Reference
Toohey M.J., Chemistry of the Soil, Melb., Swinburne College Press, 1980

SC402 Environmental Health
Six hours per week for one semester
A final year subject in the diploma course in applied science (environmental health).
A study of food surveillance, pollution investigation, waste disposal (solid and liquid) and other areas of vocational interest to health surveyors, such as
Report and letter writing: techniques.
Food establishments: both eating and manufacturing; investigation and surveillance techniques; practical visits and reports; legal standards.
Domestic sewage disposal: all waste and smaller septic tank units; disposal fields and legal standards under the Health Act; soil absorption and transpiration theory; field visit and report.
Pest control: recognition and control.
Fire engineering: fire control; architectural and building considerations; health surveyor's role; public buildings; report.
Solid and liquid waste collection and disposal: field visit to augment CP401 lectures.
Administration
A study of state and local government authorities engaged in the administration of environmental health, including the structures and duties of councils, EPA and Health Commission.
Accommodation
Legal standards laid down for motels, hotels and apartment houses, camping areas, caravan parks and others.
Civil defence
The role of the health surveyor in times of civil disturbance or natural disaster e.g. fire or flood.
SC404 Project
A minimum of one hundred and twenty hours
A unit undertaken by part-time diploma/degree conversion students. The unit comprises individually assigned work normally associated with the student's occupation.

SC405 Ceramic and Silicate Chemistry
One hour per week for one semester
An elective subject in the final year of the degree courses for students majoring in chemistry.
A survey of the structures of silicate minerals used in ceramics. Manufacture of glass an2 cement. Manufacture, structure and use of modern ceramics.

SC406 Chemical Physiology
One hour per week for one semester
An elective subject in the final year of the degree course for students majoring in biochemistry.
The course relates organ structure and physiological function to detailed biochemical mechanisms.
The following topics are studied:
The molecular basis of immunological processes.
The physiology of the renal system and respiratory systems.
The function of these systems in the control of body fluids and acid base balance.
References
References and reading material will be specified during the course.

SC407 Liquid and Solid Fuel Technology
One hour per week for one semester
An elective subject in the final year of the degree courses for students majoring in chemistry.
The world energy scene: petroleum and coal reserves. The Australian energy scene: significant events in oil and gas exploration and development, in onshore and offshore sedimentary basins, the future. Australian coal reserves.
The character of crude oil.
Petroleum refinery products: gasoline fraction — fuel quality to match the internal combustion engine, diesel fuels, lubricating oils.
Production of synthetic gasolines from coal and natural gas via methanol.
Alcohols as transport fuels, recent West German research.
Black and brown coal; present uses in Australia.

SC408 Instrumental Techniques
Eighteen hours in one semester
An elective subject in the final year for the degree courses for multidiscipline students majoring in chemistry and for whom additional laboratory work is required for the completion of their courses.
The subject comprises practical work undertaken in day or half-day sessions and involves instrumental methods of chemical analysis.

SC409 Seminars
Two hours per week for one semester
A final year subject for degree students majoring in applied chemistry.
Students will investigate problems of current chemical/social importance by a combination of literature search, appropriate visits and seminar sessions.

SC411 Seminars, visits, etc.
Seminars, visits, etc., sixty-three hours in one semester
A final year subject in the diploma course in applied science (environmental health).
As a continuation of SC311 Seminars, visits, etc., time is devoted to inter-relating the various disciplines studied in the course and the students’ work experience. Professional health surveyors and other experts attend the seminars when a topic of their particular expertise is being discussed. This develops a relationship between the students and practising professionals and leads to a heightened appreciation of the role of a health surveyor in the community.
Students present a paper on a relevant subject which is examined critically by the visiting professionals, the academic staff and the other students.

SC415 Food Chemistry
One hour per week for one semester (including six hours of practical work)
An elective subject in the final year of the degree courses for students majoring in chemistry.
The course includes the following topics — general chemistry of food, metabolic fate of food components, the role of vitamins, food analysis, methods of food preservation, chemical additives in food. The practical course introduces the student to some of the techniques used in food analysis.

SC423 Bio-organic Chemistry
One hour per week for one semester
An elective subject in the final year of the degree course for students majoring in biochemistry.
The subject has two main sections — steroids and biosynthetic mechanisms. It gives a mechanistic understanding of important natural product chemistry.

SC429 Computers in Chemistry
One hour (including practical work) per week for one semester
An elective subject in the final year of the degree courses for students majoring in chemistry.
Digital systems in scientific instrumentation, The structure and use of a microprocessor system including its interfacing to laboratory equipment.

SC431 Physical Chemistry
Two hours per week for one semester
Prerequisite, SC331
A final year subject for degree students majoring in chemistry.
Kinetic studies of chemical reactions. Review of molecular kinetics; development of transition state theory based on statistical thermodynamics, thermodynamic formulations of transition state equations.
Non-branching chain gas reactions. Branching chain gas reactions, gas phase autoxidations including hydrocarbons, reactions in the internal combustion engine, fuels to match high engine compression ratios; exhaust emissions from internal combustion engines and their control, photochemical smog formation; high explosives; gas reactions in the upper atmosphere, the ozone layer.
Solution kinetics. Dielectric constant (solvent) and ionic strength effects; $\Delta S^0$, $\Delta V^0$, and hydrostatic pressure effects, high pressure chemistry.
References
Dickenson, R.E. Molecular Thermodynamics. N.Y., Benjamin, 1969

SC441 Analytical Chemistry
Three hours per week for one semester
A final year subject for degree students majoring in chemistry.
The basic analyser — its structure and frequency response.
Data processing. Nuclear magnetic resonance spectroscopy.
Mass spectrometry, including interfacing with a gas chromatograph.
X-ray methods: diffraction, fluorescence and adsorption.
References
Morrison, R.T. and Boyd, R.N. Organic Chemistry. 3rd edn, Boston, Allyn & Bacon, 1973
Verdin, A. Gas Analysis Instrumentation. Lond., Macmillan, 1973

SC461 Organic Chemistry
Two hours per week for one semester
Prerequisite. SC361
A final year subject for degree students majoring in chemistry.
This course in modern organic chemistry will discuss the fundamentals of stereochemistry. The principles involved will be illustrated in a study of the chemistry of monosaccharides and disaccharides. Polysaccharides will also be considered as an introduction to the principles of macromolecular chemistry. Current developments in applied organic chemistry will be featured.
References
Refer lecturer in charge.

SC482 Biochemistry
Two hours of theory per week for one semester
Prerequisites. SC361, SC382
A final year subject for degree students majoring in biochemistry.
The course introduces the following topics of applied significance:
Industrial genetics, industrial enzymes, clinical chemistry, fermentation pathways.

References
References and reading material will be specified during the course.

SC483 Physical Biochemistry
Three hours of theory and three hours of practical work per week for one semester.
Prerequisites. SC288, SC231, SC382
A final year subject for degree students majoring in biochemistry.
The course is designed to establish an understanding of a number of basic physical and physico-chemical techniques as applied to biochemical analyses. Topics include enzyme kinetics, molecular weight determinations, X-ray crystallography, spectroscopy.
References
(Additional reference and reading material will be specified during the course).

SC491 Practical Chemistry
Ninety hours of practical work in one semester
A final year subject for degree students majoring in applied chemistry.
This course is designed to teach instrumental analytical techniques. Students are expected to plan their own experiments and to solve experimental problems. They will round off their knowledge of, and ability to use, instruments found in the chemical industry.

SC503 Specific Instruments
A one hundred and twenty hour unit of semester four of the graduate diploma course in scientific instrumentation.
A study of a selection of instruments and instrument systems, covering the principles of operation, optical systems, control systems, computer processing and display techniques. The instruments studied are selected to accord with the main interests of the course participants.

SC511 Basic Microbiology
A twelve hour theory unit of semester one of the graduate diploma course in industrial microbiology.
The unit gives an historical introduction to the subject, then surveys the characteristics of eukaryotic and prokaryotic organisms, rickettsiae, chlamydia and viruses. Methods used in the study of micro-organisms are discussed, including basic principles of microbial nutrition, the types and formulation of culture media and basic principles of sterilisation.

SC512 Microbial Physiology
A twenty four hour theory unit of semester two of the graduate diploma course in industrial microbiology.
Introduction to microbial genetics. Bacterial genetics — nature of the genetic material, mutation, replication, conjugation, episomes, plasmids, transformation, bacteriophage and transduction. Eukaryotic genetics — chromosomes and replication, mitosis, meiosis and recombination. Nutritional categories of micro-organisms — basic biochemistry of photolithotrophic, photo-organotrophic, chemolithotrophic and chemo-organotrophic nutritional modes including a discussion of specific examples.
Introduction to mechanisms of metabolic controls in micro-organisms.
Methodology of microbial physiological studies — whole cell, cell-free and organelle preparations; use of radio-isotopes; genetic analysis.

**SC513 Microscopy**
A nine hour theory unit of semester one of the graduate diploma course in industrial microbiology.

Physics of light — interference and diffraction.
Theory of bright field microscopy — resolution and contrast.
Theory and applications of phase contrast microscopy, interference microscopy, ultraviolet and fluorescence microscopy.
Theory and techniques of electron microscopy, transmission and scanning.
Techniques of sample preparation.

**SC514 Practical Work**
A sixty hour practical unit of semester one of the graduate diploma course in industrial microbiology.

The experimental work serves to illustrate and reinforce principles dealt with in semester one of the course.

**SC515 Disinfection and Sterilisation**
A twelve hour theory unit of semester one of the graduate diploma course in industrial microbiology.

Chemical classes of disinfectants; mode of action; factors affecting efficiency; methods of testing effectiveness.
Sterilisation — kinetics and probability concepts; methods and mechanisms of sterilisation. Factors affecting efficiency of sterilisation and methods for evaluating efficiency.
Sampling techniques in sterility testing.

**SC516 Infectivity and Host Responses**
A twelve hour theory unit of semester one of the graduate diploma course in industrial microbiology.

Normal flora — invasion, succession, climax — examples from human and other environments. Symbiosis.
Pathogenesis — enzymes and toxins; biochemical basis of microbial pathogenicity including viral infections. The carrier state.
Host defences — non-specific and specific.
Methods of serology.

**SC517 Laboratory Safety and Design**
A twelve hour theory unit of semester two of the graduate diploma course in industrial microbiology.

Hazards of common laboratory procedures.
Principles of microbiological laboratory design — optimisation of media preparation, work space, culture and waste disposal and staff safety facilities; management of the laboratory environment — UV installations, HEPA filter systems, laminar flow devices.
Equipment for the microbiological laboratory — basic requirements, special equipment, specifications, sources. Media preparation, storage and evaluation.
Culture storage and control.
Specifications and regulations for microbiological laboratories.

**SC518 Survey of Applied Microbiology**
A nine hour theory unit of semester two of the graduate diploma course in industrial microbiology.

A preview of the range of applications of micro-organisms in industry.

**SC519 Practical Work**
A sixty hour practical unit of semester two of the graduate diploma course in industrial microbiology.

The experimental work serves to illustrate and reinforce principles dealt with in semester two of the course.

**SC520 Microbial Growth**
A twenty four hour theory unit of semester three of the graduate diploma course in industrial microbiology.

Growth measurement — methods and limitations. Kinetics and applications of batch and continuous culture systems.
Synchronous growth, methods and applications.
Operation, measurement and control in fermentations. Applications of growth systems to industrial processes — fermentation dynamics.
Use of computers in fermenter control.

**SC521 Microbial Enzymes**
A twelve hour theory unit of semester three of the graduate diploma course in industrial microbiology.

Chemical and kinetic characteristics of enzymes. Importance of microbial sources of enzymes with industrial, analytical and medical applications. Microbial enzyme production. Examples of enzyme application. Immobilised enzyme technology.

**SC522 Applied Microbial Genetics**
A nine hour theory unit of semester three of the graduate diploma course in industrial microbiology.

Genetic mechanisms and life cycles of industrially important micro-organisms including viruses, bacteria, streptomyces, yeasts and filamentous fungi.
Principles of strain selection and strain improvement involving the selection of mutants and application of recombination techniques. Principles of strain management.

**SC523 Practical Work**
A sixty hour practical unit of semester three of the graduate diploma course in industrial microbiology.

The experimental work serves to illustrate and reinforce principles dealt with in semester three of the course.

**SC524 Microbiological Assay**
A nine hour theory unit of semester four of the graduate diploma course in industrial microbiology.

Principles of microbiological assay. Survey of the range of applications. Specific methods, limitations and evaluation.
SC525  Biodeterioration/Waste Treatment
A nine hour unit of summer four of the graduate diploma course in industrial microbiology.
Mechanisms of action and control of microbial activity involved in deterioration of materials, including foods. Principles of co-metabolism. Use of micro-organisms in waste treatment and materials recovery (e.g. mineral leaching).

SC526  Industrial Fermentations
A fifteen hour unit of semester four of the graduate diploma course in industrial microbiology.
An examination of production methods, metabolic pathways and metabolic controls of selected fermentations of industrial importance.

SC527  Microbiological Monitoring
A twelve hour unit of semester four of the graduate diploma course in industrial microbiology.
A study of the details of sampling, sample treatment, growth media, culture conditions, biochemical tests, serological tests and regulations associated with the monitoring of the microbiological status of raw materials and products in the pharmaceutical, food and cosmetic industries.

SC528  Project
A practical unit of semester four of the graduate diploma course in industrial microbiology with a minimum commitment of sixty hours.
Each student undertakes, under supervision, a project involving the solution, or the development of an approach to the solution, of a microbiological problem. Ideally the project is based on the student's employment but college-based projects are arranged if necessary.

SC530  Properties of Colloids
A core subject of the graduate diploma course in applied colloid science—120 hours.
Applications Throughout this compulsory section, particularly during tutorials, strong emphasis is upon applying the basic theory to practical examples.
Practical Work The basic practical skills and techniques of colloid science are taught here and will be drawn from the following areas: Cleaning techniques and surface preparation; the measurement of surface and interfacial tension of pure liquids and liquid mixtures; adsorption at the liquid-air interface—assessment of surface concentrations; adsorption at the solid-liquid interface—determination of adsorption isotherms, measurement of surface area; the properties of insoluble monolayers; inorganic sols—preparation, critical flocculation concentration, protective action, heteroflocculation; the properties and behaviour of macromolecules in aqueous solution.

SC531  Colloid Experimental Techniques
A core subject of the graduate diploma course in applied colloid science—120 hours
Applications Selected practical problems are dealt with in order to demonstrate the relevance of the various techniques.
Practical Work The surface tension of aqueous and non-aqueous solutions; the measurement of contact angle; electrokinetic techniques—streaming potential microelectrophoresis, electro-osmosis; potentiometric and conductimetric techniques; measurement of flocculation rate; determination of particle size; surface spectroscopic studies etc.

SC532  Emulsion Technology
An elective subject in the graduate diploma course in applied colloid science—120 hours.
Principles Basic properties and characteristics of emulsions. The theory of emulsion stability—surface chemical factors, applicability of the DLVO theory, the role of macromolecules as emulsion stabilisers, stabilisation by finely divided solids, the properties of thin films.
Applications Selected case studies are dealt with from the areas of cosmetic emulsions, food emulsions, bitumen emulsions, wax emulsions etc.
Practical Work Basic methods of emulsion preparation: the identification of emulsion type; particle size and viscosity of emulsions; assessment of stability: the effect of emulsifier type on interfacial tension and on the electrokinetic properties of emulsions; the design and preparation of emulsions in a specific area (e.g. microemulsions, cosmetic emulsions); foaming and antifoaming agents; minor project work.

SC533  Polymer Flocculation
An elective subject in the graduate diploma course in applied colloid science—120 hours
Applications General principles of water treatment—selected case studies (e.g. iron removal, removal of emulsified oils). Flocculation of clays, paint pigments, etc.
Practical Work
Assessment of stability; methods for screening flocculants; effect of flocculant dosage, type and molecular weight on floc formation; the co-operative effect of metal ions and polyelectrolytes; effect of pH on floculation; floc building; floculation and filtrability; analytical methods for determining low concentrations of flocculants; minor project work.

SC534 Mineral Processing Chemistry
An elective subject in the graduate diploma in colloid science—120 hours.
Principles
Mineral analysis—XRD, XRF, electron microprobe. Particle liberation—crushing, grinding, classifying (brief coverage of these areas). Mineral floatation—wetting, hydrophobicity. Activators, frothers, collectors and depressants—solution properties, behaviour. Flootation of sulphides—semiconductor properties of the mineral; action of collectors and metal ions. Coal floatation. Flootation of silicates, oxides, etc. Chemistry of mineral slurries. Floculation of minerals—selective floculation, fine particle recovery, etc.
Applications
Selected experiments in mineral analysis; particle size analysis; interfacial properties of minerals—zeta potential, surface charge; adsorption of collectors; contact angle and bubble pick-up techniques; flotation studies—Hallimond tube. Fuerstenau cell, vacuum flotation techniques; role of pH, Eh and metal ion concentration in flotation; selective floculation; selected case studies; minor project work.

SC535 Detergency
An elective subject in the graduate diploma in applied colloid science—120 hours.
Principles
The origin, manufacture, nature and use of detergents. The principal types of detergents, the role of additives, etc. Detergent action—adsorption at interfaces, wettability and contact angles. Solution properties of detergents—micelle formation, phase diagrams, solubilisation, surface tension, etc. The differences in behaviour between cationic, anionic and non-ionic detergents. Methods of analysis (e.g. ranging from cloud point determination and two phase titrations to infra-red and NMR analysis). Detergent biodegradability (brief treatment).
Applications
Detergent formulation for specific needs, e.g. softeners, conditioners, emulsification, etc. Particular case studies are dealt with here.
Practical work
The adsorption of detergents—degree of adsorption, effect on contact angle; effect on zeta potential; solution properties of detergents—surface tension, critical micelle concentration, phase diagrams; detergent analysis—titrations, instrumental analysis; experiments on selected problems will be performed (e.g. removal of lanolin from wool, formulation of hair shampoos, etc.); minor project work.

SC536 Surface Coating
An elective subject in the graduate diploma in applied colloid science—120 hours.
Principles
Applications
Selected case studies with a strong emphasis on tailoring a particular coating for a specific surface.
Practical work
The structure of silicone coatings and their correlation with wettability and adhesive strength; formulation of a simple paint; rheology properties; dispersion of pigments; preparation of resins; preparation and characterisation of latices; characterisation of coated surfaces (e.g. by electronmicroscope); minor project work.

SC537 Corrosion and Protection of Metals
An elective subject in the graduate diploma in applied colloid science—120 hours.
Principles
(i) Equilibrium electrochemistry (brief treatment)
Elementary aspects: redox reactions; electrochemical cells; Nernst equation; conventions. Thermodynamic effects: relationship between $E^0$ and equilibrium constant; effects of inert electrolytes, competing reactions and pH; Pourbaix diagrams; limitations in the use of the Nernst equation.
Applications
The complete corrosion cell. Corrosion current and factors affecting it—applications to protection and inhibition. Corrosion by pure water. Case studies drawn from the following areas will be dealt with: corrosion by potable water and in the marine environment; corrosion in steam condensers; cathodic protection, sacrificial protection; metallic coatings; dezincification of brass; materials of construction in a chemical plant; economic aspects in combating corrosion; minor project work.
Practical work
Measurement of equilibrium cell potentials; galvanostatic and potentiostatic techniques; practical experiments demonstrating inhibition, etc.
Chemistry Practical Work

In all the degree and diploma courses in chemistry, applied chemistry and biochemistry, practical work forms an important part of the main chemistry subjects except SC431, SC441 and SC461 which are final year subjects for students majoring in chemistry. The practical work is an integrated course which may relate to a number of chemistry subjects. The hours per week given in the course details include the appropriate practical work. The following complements the information given in the subject details.

All students must acquire a set of practical notes at the start of the first semester.

Satisfactory completion of the practical work is required before a student may obtain an assessment for the relevant theory examinations. In combination with the theory assessment, the student’s ability in practical work will form part of his final assessment in the appropriate subjects.

Common first year

The integrated practical course of 120 hours is part of SC131/2, SC141/2, SC151/2 and SC161/2, and is designed to teach common chemical techniques and to illustrate the theory covered in lectures. It may be divided into two parts —

(a) Physical and Analytical Chemistry, and

(b) Inorganic and Organic Chemistry

Part-time students must therefore undertake either part (a) or part (b) or both.

References

Degree second year

This integrated practical course occupies 72 hours for students majoring in chemistry or 126 hours for students taking a double major in applied chemistry. It forms part of SC231/3, SC251/3 and SC261/3 and is designed to teach accurate analytical techniques, some organic techniques and some of the principles of physical chemistry.

Degree third year

This integrated practical course occupies 54 hours for students majoring in chemistry or 90 hours for students taking a double major in applied chemistry. It forms part of SC331/3, SC351 and SC361/3 and is designed to teach organic techniques, some analytical techniques and some of the principles of physical chemistry.

Diploma second year

This practical course is designed to teach accurate analytical techniques, organic techniques and the principles of physical chemistry and occupies the following hours:

<table>
<thead>
<tr>
<th>Applied Chemistry</th>
<th>Hours</th>
<th>Related subjects</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>330 F.T.</td>
<td>SC246, SC246</td>
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<td>SC247</td>
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<td>SC236, SC237</td>
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<td>240 P.T.</td>
<td>SC266, SC246</td>
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<td>SC247</td>
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<tr>
<td></td>
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<td>SC236, SC237</td>
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</tbody>
</table>

* To be eligible for the part-time course the student must be in approved employment.

Diploma third year

The integrated practical course occupies 360 hours for full-time applied chemistry students and 180 hours for biochemistry students. It forms part of SC236, SC346, SC366, SC367 and SC387.

The course may be divided into three sections and taken on a part-time basis. The student will then do those sections of the practical work associated with the lecture courses being taken, generally in the order given below:

Section A
Instrumental/Analytical/Physical
Biochemistry techniques/projects

Section B
Physical/Instrumental/Analytical
projects

Section C
Organic experiments/projects

The part-time course for applied chemistry diploma students occupies 240 hours and to be eligible the student must be in approved employment.

References

SK121 Computer Science

Thirty-six hours in one semester.

A compulsory subject in the common first year of the degree/diploma courses in applied science.

This is an introductory course in the use of computers to solve problems in the area of applied science. The course uses either FORTRAN or PASCAL as a programming language to introduce the student to structured programming concepts and techniques.

Students are required to complete several programming exercises as an integral part of the course.

Textbook

Reference

SK122 Computer Science

Thirty-six hours in one semester.

A compulsory subject in the common first year of the degree/diploma courses in applied science.

The course will include:

An introduction to the use of an analogue computer in solving systems of simultaneous equations.

An introduction to data structures and their applications, structured programming concepts and techniques and their application to problem solving in applied science.

Students are required to complete several programming exercises as an integral part of the course.

Textbook
Reference
Gear, C.W. Applications and Algorithms in Computer Science.
SRA, Chicago, 1978

Other reference material will be advised during lectures.

**SK203 Computer Science**
Eight hours per week for one semester.
Prerequisite, completion of the common first year.

A second year subject for degree students majoring in computer science.
An introductory study of the major aspects of computing principles and techniques during which students obtain programming practice and complete assignments on which assessment is based.

Topics covered include: structured programming; software engineering; operating system principles; introduction to computer organisation; file organisation and handling; data structures; assembler programming; simulation and modelling.

**SK213 Computer Science**
Two hours per week for one semester.
Prerequisite, satisfactory completion of the common first year or some background in computer programming.

An elective second year subject for students majoring in mathematics and chemistry or instrumental science.

The course includes study of computer programming techniques and an introduction to computer simulation and modelling.

**SK214 Computer Science**
Two hours per week for one semester.
Prerequisite, satisfactory completion of the common first year or equivalent qualification and some experience in the use of computers in business, engineering and science.

An elective second year subject for students majoring in mathematics and chemistry or instrumental science.

The course provides an introduction to systems science, some aspects of computer design and construction and a relatively advanced course on computer simulation and modelling.

**SK303 Computer Science**
Nine hours per week for one semester
Prerequisite, SK203

A third year subject for degree students majoring in computer science. A study at an advanced level of computing principles and techniques during which students obtain further programming practice and complete assignments on which assessment is based.

Topics covered include: theory of computation; software engineering (including participation in a software hut); organisation of programming languages; systems programming; and four units from the following list of computer applications:
- real-time systems
- simulation and modelling
- computer communications
- data base system design
- computer graphics
- computers and society.

The above applications units will not all be offered in any one year. Their availability will be determined in response to student requirements.

**SK313 Computer Science**
Three hours per week for one semester.
Prerequisite, SK213 or SK214 or equivalent experience in the use of computers in business, engineering or science.

A third year subject for students majoring in mathematics and chemistry or instrumental science.

The course covers an introduction to systems science, some aspects of computer design and construction, and a relatively advanced course on computer simulation and modelling.

**SK403 Computer Science**
Eight hours per week for one semester
Prerequisite, SK303

A final year subject for degree students majoring in computer science.

A rounding-off of the study of computing principles and techniques undertaken in SK203 and SK303. Students obtain further programming practice and complete assignments on which assessment is based.

Topics covered include: theory of computation; software engineering (including participation in a software hut); organisation of programming languages; systems programming; and four units from the following list of computer applications:
- real-time systems
- simulation and modelling
- computer communications
- data base system design
- computer graphics
- computers and society.

The above applications units will not all be offered in any one year. Their availability will be determined in response to student requirements.

**SK511 Methodology of Simulation**
Forty hours in one semester

A subject of semester two of the graduate diploma course in computer simulation.

This unit introduces the student to the general concepts of scientific methodology and exhibits the simulation model as a species of scientific tool.

The course consists of:
(a) an elementary study of the general ideas of deduction, induction and scientific explanation,
(b) a study of science as a problem-solving activity,
(c) a consideration of the role played by theories in science,
(d) a consideration of the nature of change in scientific theories, and
(e) a study of models and analogies in science including the function of models and the nature of analogical argument.

**SK512 Digital Simulation Languages**
Forty-five hours in one semester

A subject of semester one of the graduate diploma course in computer simulation.

This unit introduces the student to the art of simulation through a study of special purpose simulation languages. Two languages are used in the course: one a discrete event language and the other a continuous event language. These are chosen from SIMULA, CSL, GPSS, and ASIM (Analogue Simulator Package). As a part of this unit the student is expected to create a few models in each language as practical work for this part of the course.

AS33
SK513 Computer Techniques — Digital
Thirty hours in one semester
A subject of semester one of the graduate diploma course in computer simulation.
This unit studies simulation models which are to be implemented on a digital computer although not necessarily in a special purpose language. The course is primarily concerned with aspects of the design of such models, for example, the choice between deterministic and stochastic models, the method of time advance (unit time versus event advance), problems involved in transient phenomena, search techniques and feedback loops. The student is expected to undertake practical work as an integral part of this unit.

SK514 Computer Techniques — Analogue
Forty hours in one semester
Prerequisite, SK512 or equivalent experience
A subject of semester two of the graduate diploma course in computer simulation.
This unit introduces the student to the hardware and use of analogue computing equipment. The course considers
(a) the functional building blocks of an analogue computer including their accuracy and stability,
(b) the problems of amplitude and time base scaling,
(c) the generation of continuous and discontinuous functions,
(d) implicit functions and functions of two variables,
(e) the analysis of corrective systems, and
(f) solutions to ordinary and partial differential equations.

SK515 Computer Techniques — Hybrid
Sixty hours in one semester
Prerequisites, SK513 and SK514 or equivalent experience
A subject of semester three of the graduate diploma course in computer simulation.
This unit integrates the concepts studied in the earlier units and introduces the student to the use of hybrid computers. The course considers
(a) the hardware of a hybrid computer including devices such as registers, flip-flops, analogue-to-digital and digital-to-analogue devices,
(b) the software required to support such a system,
(c) the special facilities offered by hybrid computers to model builders, and
(d) a selection from the following list of applications,
   (1) Transient queuing theory with multiple servers
   (2) Linear controls system simulators
   (3) Traffic control simulation
   (4) Chemical processing plant simulation
   (5) Vehicle dynamics
   (6) Gas pipeline networks
   (7) Hodgkin and Huxley nerve membrane activity.

SK516 Project Work
Sixty hours in one semester
Prerequisites, SK513, SK514 and SK515 or equivalent experience
A subject of semester three of the graduate diploma course in computer simulation.
In this subject and in SK518 all students undertake, under supervision, practical work in simulation. They are encouraged to undertake problems from as wide a range of disciplines as possible, but emphasis is placed upon projects which relate to the student’s own areas of interest.

SK517 Case Studies
Thirty hours in one semester
Prerequisites, SK513, SK514 and SK515 or equivalent experience
A subject of semester four of the graduate diploma course in computer simulation.
The units which comprise this subject round off and integrate the concepts, tools and techniques studied in the earlier part of the course. Each unit consists of a detailed examination, led by practitioners in the art and science of simulation in several real-life studies. For each problem the group considers critically the origins of the problem, its formulation into a model, the problems associated with the implementation of the model and finally, the ultimate degree of success or otherwise of the problem’s solution. A large proportion of discussion leaders are drawn from the ranks of those actively using simulation techniques in industry or research.

SM121 Mathematics
Three hours per week for one semester
A first year subject in the diploma course in applied science (environmental health).
The course introduces and consolidates the basic mathematical techniques needed by students and practitioners of environmental health.
Topics will be chosen from:
(a) Basic mathematical operations; indices and logarithms; algebraic manipulations; trigonometric functions
(b) Numerical methods; use of calculators, rounding errors and their consequences
(c) Functions and graphs (algebraic, logarithmic and exponential functions), tabulation, interpolation, curve fitting, ‘least square’ criterion
(d) Elementary calculus; differentiation and applications, partial differentiation, integration and applications, differential equations of first order, approximate integration using Simpson’s rule.
Students are expected to have a background of general mathematics. It is recommended that each student has the use of a calculator and the lecturers, on request, will advise on its purchase.
SM122 Mathematics
Fifteen hours in one semester
A first year subject in the diploma course in applied science (environmental health).
An introduction to probability and descriptive statistics, including:
(a) tabular and graphical presentation of observed data, frequency distributions, histograms, ogives.
(b) mean and standard deviation and other measures of central tendency and dispersion.
(c) probability theory: independent events, mutually exclusive events, conditional probability.
(d) concept of a random variable and of discrete and continuous probability distribution.

SM151 Mathematical Methods
Five hours per week for one semester
A compulsory subject in the common first year of the degree/diploma courses in applied science.
Boolean arithmetic and algebra, switching circuits, set theory, Karnaugh maps, elementary symbolic logic.
Linear algebra, systems of linear equations, determinants matrices.
Functions, relations and graphs in Cartesian and polar co-ordinates, limits and continuity, elementary functions and their inverses.
Differentiation and its applications, optimisation, the mean value theorem.
Integration and its applications, improper integrals.
Differential equations, standard first order types, second order linear with constant coefficients.
Workshop
Preliminary reading
References
Shenk, A. Calculus and Analytic Geometry. Santa Monica, Calif., Goodyear, 1977

SM122 Mathematical Methods
Fifteen hours in one semester
A first year subject in the diploma course in applied science (environmental health).
An introduction to probability and descriptive statistics, including:
(a) tabular and graphical presentation of observed data, frequency distributions, histograms, ogives.
(b) mean and standard deviation and other measures of central tendency and dispersion.
(c) probability theory: independent events, mutually exclusive events, conditional probability.
(d) concept of a random variable and of discrete and continuous probability distribution.

SM151 Mathematical Methods
Five hours per week for one semester
A compulsory subject in the common first year of the degree/diploma courses in applied science.
Boolean arithmetic and algebra, switching circuits, set theory, Karnaugh maps, elementary symbolic logic.
Linear algebra, systems of linear equations, determinants matrices.
Functions, relations and graphs in Cartesian and polar co-ordinates, limits and continuity, elementary functions and their inverses.
Differentiation and its applications, optimisation, the mean value theorem.
Integration and its applications, improper integrals.
Differential equations, standard first order types, second order linear with constant coefficients.
Workshop
Preliminary reading
References
Shenk, A. Calculus and Analytic Geometry. Santa Monica, Calif., Goodyear, 1977

SM213 Mathematics
Two hours per week for one semester
Prerequisites, SM121 and SM122
A second year subject in the diploma course in applied science (environmental health).
An introduction to sampling and the interpretation of statistical data including—
(a) examples of probability distributions (discrete and continuous), binomial, Poisson and the normal.
(b) sampling theory, means, difference of means, t-, x2- and F- distributions.
(c) Estimation theory: estimating means, difference between two means, proportion, difference between two proportions and estimating the variance and the ratio between two variances.
(d) Tests of hypotheses, including test for independence
(e) Elementary regression and correlation.

SM251 Mathematical Methods
Eight hours per week for one semester
A second year subject for degree students majoring in mathematics.
Prerequisite, completion of the common first year.
Statistics and probability: probability, variates and statistical distribution, index numbers, stochastic models and decision theory.
Vectors: revision, products, geometry of lines, planes and surfaces.
Calculus: functions of many variables, partial differentiation, gradient and directional derivative. Multiple integrals. Space curves, parametric co-ordinates, differentiation with respect to a parameter, simple line integrals. Parametric co-ordinates for a surface, simple surface integrals.
Workshop
References:

Piskunov, N. Differential and Integral Calculus. 2nd edn, Moscow, Mir Publishers, 1974
Shenk, A. Calculus and Analytic Geometry. Santa Monica, Calif., Goodyear, 1977

SM162 Numerical Methods
One hour per week for one semester
A compulsory subject in the common first year of the degree/diploma courses in applied science.
Error types and analysis, solution of non-linear equations, numerical integration, linear algebra—direct and iterative procedures, differential equations—initial value problems.
Some practical computation will be included in assignment work, requiring the use of calculators or computer programs
References

SM211 Numerical Methods
One hour per week for one semester
Prerequisites, SM121 and SM122
A second year subject in the diploma course in applied science (environmental health).
An introduction to probability and descriptive statistics, including:
(a) tabular and graphical presentation of observed data, frequency distributions, histograms, ogives.
(b) mean and standard deviation and other measures of central tendency and dispersion.
(c) probability theory: independent events, mutually exclusive events, conditional probability.
(d) concept of a random variable and of discrete and continuous probability distribution.
SM215 Mathematical Methods
Five hours per week for one semester
A compulsory subject in the common first year of the degree/diploma courses in applied science.
Boolean arithmetic and algebra, switching circuits, set theory, Karnaugh maps, elementary symbolic logic.
Linear algebra, systems of linear equations, determinants matrices.
Functions, relations and graphs in Cartesian and polar co-ordinates, limits and continuity, elementary functions and their inverses.
Differentiation and its applications, optimisation, the mean value theorem.
Integration and its applications, improper integrals.
Differential equations, standard first order types, second order linear with constant coefficients.
Workshop
Preliminary reading
References
Shenk, A. Calculus and Analytic Geometry. Santa Monica, Calif., Goodyear, 1977

SM213 Mathematics
Two hours per week for one semester
Prerequisites, SM121 and SM122
A second year subject in the diploma course in applied science (environmental health).
An introduction to sampling and the interpretation of statistical data including—
(a) examples of probability distributions (discrete and continuous), binomial, Poisson and the normal.
(b) sampling theory, means, difference of means, t-, x2- and F- distributions.
(c) Estimation theory: estimating means, difference between two means, proportion, difference between two proportions and estimating the variance and the ratio between two variances.
(d) Tests of hypotheses, including test for independence
(e) Elementary regression and correlation.

SM251 Mathematical Methods
Eight hours per week for one semester
A second year subject for degree students majoring in mathematics.
Prerequisite, completion of the common first year.
Statistics and probability: probability, variates and statistical distribution, index numbers, stochastic models and decision theory.
Vectors: revision, products, geometry of lines, planes and surfaces.
Calculus: functions of many variables, partial differentiation, gradient and directional derivative. Multiple integrals. Space curves, parametric co-ordinates, differentiation with respect to a parameter, simple line integrals. Parametric co-ordinates for a surface, simple surface integrals.
Workshop
References:

Piskunov, N. Differential and Integral Calculus. 2nd edn, Moscow, Mir Publishers, 1974
Shenk, A. Calculus and Analytic Geometry. Santa Monica, Calif., Goodyear, 1977

SM162 Numerical Methods
One hour per week for one semester
A compulsory subject in the common first year of the degree/diploma courses in applied science.
Error types and analysis, solution of non-linear equations, numerical integration, linear algebra—direct and iterative procedures, differential equations—initial value problems.
Some practical computation will be included in assignment work, requiring the use of calculators or computer programs
References

SM211 Numerical Methods
One hour per week for one semester
Prerequisites, SM121 and SM122
A second year subject in the diploma course in applied science (environmental health).
An introduction to probability and descriptive statistics, including:
(a) tabular and graphical presentation of observed data, frequency distributions, histograms, ogives.
(b) mean and standard deviation and other measures of central tendency and dispersion.
(c) probability theory: independent events, mutually exclusive events, conditional probability.
(d) concept of a random variable and of discrete and continuous probability distribution.
References
Hohn, F.E., Elementary Matrix Algebra. N.Y., Macmillan, 1964
Mendenhall, W., Introduction to Probability and Statistics, 4th edn, Belmont, Calif. Duxbury, 1975
Mendenhall, W., The Design and Analysis of Experiments. Belmont, Calif. Duxbury, 1971
Mendenhall, W., Ott, L. and Schaeffer, R.L., Elementary Survey Sampling. Belmont, Calif. Duxbury, 1971
Moore, P.G., Basic Operational Research, Lond., Pitman, 1968
Other references as given for SM351 and SM451.

SM263 Mathematics
Four hours per week for one semester
Prerequisite, completion of the common first year.
A second year subject for degree students majoring in biophysics, instrumental science or computer science.
References.

SM351 Mathematical methods
Nine hours per week for one semester
Prerequisite, SM251
A third year subject for degree students majoring in mathematics.
Topics include:
operations research approach to problems, classical optimisation, linear and integer programming, queuing theory, sample surveys, sampling methods, repression analysis, case studies, work study, seminars. (Some topics in SM351 and SM451 may be interchanged).
References
An-Min Chung. Linear Programming. Columbus, Ohio, Merrill, 1963
Dantzig, G.B. Linear Programming and Extensions, Princeton, N.J., Princeton UP, 1963
Open University Linear Programming — Theory, 1972
Open University, Linear Programming: A Case Study, (Videorecord), Open University, Linear Mathematics Course Team. Made by BBC-TV 1971
British Standard 3138, Glossary of Terms Used in Work Study. Lond., British Standards Association, 1969
Barnes, R.M., Motion and Time Study, 3rd edn, N.Y., Wiley, 1949

SM363 Mathematics
Three hours per week for one semester
Prerequisite, SM263
A third year subject for degree students majoring in computer science and instrumental science or computer science and chemistry.
The topics covered in this subject may be varied to accommodate the needs and interests of the students undertaking the subject.
The core will include the following: modern algebra with applications to self-correcting codes and generation of pseudo-random numbers, partial differential equations (with emphasis on numerical aspects), selected topics in statistics and/or operations research.

References
See lecturer in charge.

SM451 Mathematical Methods
Eight hours per week for one semester
Prerequisite, SM351

A final year subject for degree students majoring in mathematics.

Topics include:
game theory, forecasting and inventory control, financial modelling, dynamic programming, simulation, replacement, analysis of variance, non-parametric statistics, case studies, practical project seminars. (Some topics in SM351 and SM451 may be interchanged).

References
Lewis, C.D. Scientific Inventory Control, Lond., Butterworths, 1970
Hollander, M. Non-parametric Statistical Methods, N.Y., Wiley 1973
Wonnacott, T.H. and Wonnacott, R.S. Econometrics, N.Y., Wiley, 1970
Huang, D.S. Regression and Econometric Methods, N.Y., Wiley, 1970
Richard D. Irwin Inc., 1972

SM511 Mathematical Simulation Techniques
Three hours per week for one semester

A subject of semester one of the graduate diploma in computer simulation.

Topics include:
probability, frequency distributions, confidence intervals, goodness of fit tests, sampling from distributions, random number generators, pseudo-random numbers, tests for randomness.

References

SM512 Mathematical Simulation Techniques
Forty hours in one semester.
Prerequisite, SM511

A subject of semester two of the graduate diploma in computer simulation.

A survey of methods used in the numerical solution of ordinary and partial differential equations.

References
Consult the lecturer in charge.

SM513 Mathematical Simulation Techniques
Three hours per week for one semester
Prerequisite, SM511

A subject of semester four of the graduate diploma in computer simulation.

The subject will be based on the following: analytic and simulation approach to operations research, models in queuing, forecasting, inventory, allocation, sequencing and replacement, design, testing and validation of models.

Other topics may be included and the above topics varied to accommodate the needs and interests of the students undertaking the unit.

References
Consult the lecturer in charge.

SP101 Physics
Five hours per week of theory, practical work and tutorial classes. Continuous assessment by tests and practical work.

A compulsory subject in the common first year of the degree/diploma courses in applied science.

Mechanics of particles, bodies and fluids
Thermal physics
Fields, electrical devices and circuits

Recommended texts
Weidner, R.T. and Sells, R. Elementary Modern Physics. Alternate 2nd edn, Boston, Allyn and Bacon, 1974
SP102  **Physics**  
Four hours per week of theory, practical work and tutorial classes. Continuous assessment by tests and practical work.

A compulsory subject in the common first year of the degree/diploma courses in applied science.

**Waves and vibrations**  
**Atomic and nuclear physics**  
**Geometric and physical optics**  
**Circuit Theory**

**Recommended text**  

**SP111  Physics**  
Three hours of theory and two hours of practical work per week for one semester

Continuous assessment by tests and practical work

A first year subject in the diploma course in applied science (environmental health).

- Properties of matter: gases, liquids, solids, change of state, calorimetry, temperature measurement.
- Acoustics: waves, vibratory motion.
- Electricity: electromagnetism, electrical measurements (DC and AC).

**Recommended text**  

**SP112  Physics**  
Two hours of theory and two hours of practical work per week for one semester

Prerequisite: SP111  
Continuous assessment by tests and practical work

A first year subject in the diploma course in applied science (environmental health).

- The atom: emission and absorption of radiation, X-rays.
- The nucleus: Radioactivity, nuclear reactions, radioactivity measurements.
- Electromagnetic waves.
- Geometric and physical optics.
- Signals and signal processing; transducers, instrument principles. Laser applications.
- Industrial metrology.

**Recommended text**  

**SP213  Instrumental Science**  
Eight hours per week for one semester

Prerequisite: completion of the common first year

Assessment is continuous by tests and assignments

A second year subject for students majoring in instrumental science.

- Measurement principles
- Transducers
- AC and DC Circuit theory
- Semiconductor physics and devices
- Introduction to analogue and digital techniques
- Workshop practice

**References**  
Consult the lecturer in charge

**SP223  Biophysics**  
Eight hours per week for one semester

Prerequisites: completion of the common first year

Assessment is continuous by tests and by assessment of practical work

A second year subject for students majoring in biophysics.

- Transport at the cellular level
- Electrical properties of tissue
- Electrophysiology and transport of information
- Skeletal muscle
- The cardiovascular system

**References**  
Consult the lecturer in charge

**SP304  Signals and Systems**  
Three hours per week for one semester

Prerequisite: SP213 and SM263

Assessment is continuous by tests and assignments

A third year subject for students majoring in instrumental science.

- Signal analysis techniques in optical and instrument systems
- Detection of signals in noise
- Linear system analysis using transform techniques

**References**  
Consult the lecturer in charge

**SP305  Physics**  
Three hours per week for one semester

A third year subject for students majoring in biophysics or in chemistry.

- Quantum physics
- Nuclear physics
- Properties of solids
- Radiation physics
- Acoustics

**References**  
Consult the lecturer in charge

**SP313  Instrumental Science**  
Nine hours per week for one semester

Prerequisite: SP213

Assessment is continuous by tests and assignments

A third year subject for students majoring in instrumental science.

- Nuclear, optical and chemical instrumentation
- Analogue and digital techniques in instrument electronics
- Introduction to control systems
- Instrument practice

**References**  
Consult the lecturer in charge

**SP323  Biophysics**  
Nine hours per week for one semester

Prerequisite: SP223

Assessment is continuous by tests and by assessment of practical work

A third year subject for students majoring in biophysics.
The heart: the electrocardiogram, electrical stimulation of the myocardium
Body fluids
Respiration
Monitoring the vascular system
Monitoring respiratory parameters
The autonomic nervous system
Monitoring the autonomic nervous system
Survey of endocrinology
Physiological control system
Anaesthesia and systems monitoring
Obstetric instrumentation
Bio feed-back
References
Consult the lecturer in charge

SP355  Physics
Six hours per week for one semester
Assessment is continuous by tests and practical assignments
A third year subject for students majoring in applied chemistry.
Quantum mechanics
Nuclear physics
Radiation physics, concentrating on the properties and instrumentation of the main regions of the electro-magnetic spectrum of interest to chemists
Instrumentation physics
References
Consult the lecturer in charge

SP413  Instrumental Science
Eight hours per week for one semester
Prerequisites, SP313 and SP304
Assessment is continuous by tests and assignments
A final year subject for students majoring in instrumental science.
Optical instrumentation and image processing
Lasers
Signal recovery techniques
Digital electronics, microprocessors, interfacing techniques
Control systems
Nuclear, vacuum and chemical instrumentation
Design of instrument systems
References
Consult the lecturer in charge

SP423  Biophysics
Eight hours per week for one semester
Prerequisite, SP323
Assessment is continuous by tests and practical work
A final year subject for students majoring in biophysics.
Imaging techniques
Somatic sensation, proprioception
The spinal cord
Peripheral and feed-back control of movement and posture
Stimulating and recording from the peripheral nervous system
Monitoring spinal function
The special senses
The forebrain
Functional assessment of the special senses
Special advanced topics
Hospital safety
Seminars

References
Consult the lecturer in charge

SP511  Measurement Principles
Ten hours in one semester
A subject of semester one of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
Nature of measurements
Standards
Systematic and random errors
Limits of detection
Sensitivity
Noise
Resolution

SP512  Transducers
Twenty hours in one semester
A subject of semester one of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
Actuators and sensors
The principles of operation and characteristics of a range of transducers of both types
The feed-back principle
The interfacing of transducers to signal processing or transmitting systems

SP513  Instrumental Practice
Thirty hours in one semester
A subject of semester one of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
Physical properties of constructional materials used in instruments
Instrument components and mechanisms
Practical workshop experience
Printed circuit board techniques
Wire wrappings, etc.

SP514  Instrument Electronics
Fifty hours in one semester
A subject of semester two of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
This subject consists of a study of operational amplifier and semiconductor circuits which will include:
Amplifier design and specification,
Signal processing circuits,
Low level signal techniques.

SP515  Signal Processing and Display
Thirty hours in one semester
A subject of semester three of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
Characteristics of signals and noise
Signal recovery techniques
Filter design and specification
Analogue-to-digital and digital-to-analogue conversion
Signal recording techniques.

SP516  Biomedical Project
Thirty hours in one semester
A subject of semester three of the graduate diploma course in biomedical instrumentation.
The design and construction of an item of equipment relevant to the participant's professional activity is started (e.g. microprocessor-based EEG monitoring system).
SP517 Cardiovascular Monitoring
Twenty hours in one semester
A subject of semester three of the graduate diploma course in biomedical instrumentation.
Invasive and non-invasive transducers for pressure and flow. Ion selective electrodes and monitoring serum ion levels. Determination of cardiac output and regional blood flow. Automated monitoring of cardiovascular system.

SP518 Neurological Monitoring
Twenty hours in one semester
A subject of semester four of the graduate diploma course in biomedical instrumentation.
Consideration of specific instrumental requirements. Computer-aided diagnostic procedure involving central, peripheral and sensory system. Computer analysis of evoked and spontaneous EEG in the time and frequency domain. The EMG, its recording and analysis. Stimulation techniques, e.g. electrical, mechanical, vestibular.

SP519 Respiratory Monitoring
Ten hours in one semester
A subject of semester four of the graduate diploma course in biomedical instrumentation.

SP520 Biological Imaging Techniques
Twenty hours in one semester
A subject of semester four of the graduate diploma course in biomedical instrumentation.
Ultrasonic techniques X-ray methods with a consideration of computer-aided techniques. Nuclear medicine. Thermography.

SP521 Biomedical Project
Seventy hours in one semester
A subject of semester four of the graduate diploma course in biomedical instrumentation. A continuation to completion of the project commenced in SP516 biomedical project.

SP522 Optical systems
Fifty hours in one semester
A subject of semester three of the graduate diploma course in scientific instrumentation.

AT191 Health and Society
Two hours per week for one semester
A first year subject in the diploma course in applied science (environmental health).
The course will examine psychological principles in human behaviour, covering areas such as:
— genetic determinism in behaviour
— learning principles applied to human behaviour
— communication processes and the practical application of these in one-to-one communication
— rôle development and how society reinforces different rôle patterns in people of different ages, backgrounds and sexes.
Recommended reading:

AT192 Health and Society
Two hours a week for one semester
Assessment is continuous
A first year subject in the diploma course in applied science (environmental health).
Emphasis in this course will be on topics in psychology such as: motivation, adjustment, personality and social behaviour. Attention will also be given to coping with environmental stress and anxiety.
Recommended reading:

AT291 Complementary Studies
Two hours per week for one semester
Assessment is continuous
A second year subject in all degree courses in applied science.
This course has two objectives. The first is to train students in business communications and report writing. The latter will give students experience in literature searching, constructing a bibliography and conducting an investigation leading to the preparation of a report. The second objective is to expand students’ understanding of Australian society. Current social issues — such as unemployment, immigration and automation — will be examined against a background of information and theory concerning the functions of our social, economic and political systems, as a means of developing communication skills.

AT292 Social Science 2
Two hours per week for two semesters
Assessment is continuous
A second year subject in the full-time diploma course in applied science (applied chemistry).
Details of the program to be followed will be made available from the head of the department of Liberal Studies.

AT392 Report Writing
One hour per week for two semesters
Assessment is continuous
A third year subject in the diploma course in applied science (applied chemistry) and (biochemistry).
There is no formal syllabus, but training is given in the efficient use of library facilities for the investigation of technical topics at final year level. A detailed study is undertaken of the techniques of report writing, including the search for and the collation of information, its organisation and presentation in oral and written form.
AT393 Communication Studies
One hour per week for one semester
A third year subject for degree students majoring in applied chemistry.
Training in the presentation of oral reports. Each student will be expected to present two oral reports. One will be on work experiences, the other a critical assessment of a scientific or technical topic. A satisfactory standard of presentation is required for a pass in this subject.

AT394 Report Writing
One hour per week for one semester
A third year subject for degree students majoring in biochemistry.
Training in the presentation of reports. Each student will be expected to present two oral reports. One will be on work experiences, the other a critical assessment of a scientific or technical topic. A satisfactory standard of presentation is required for a pass in this subject.

AT493 Brain and Behaviour
Four hours per week for one semester
A final year subject in the degree course in applied science for students majoring in biophysics.
The course provides an introduction to areas of human behaviour which are outside but complementary to the study of biophysics. The topics range over such areas as neuroanatomy, learning theory, memory, stress, and social theories of abnormal behaviour. The practical aspects of the course are emphasised by using lecturers from a range of academic disciplines and professional practice. Students are also introduced to some behavioural and communication skills which should be of benefit both in their private and professional lives.

Preliminary reading
Reading and other resources will be given where appropriate

BC210 Building Practices
Thirty-six hours in one semester
A second year subject in the diploma course in applied science (environmental health).
Building construction in relation to health surveying is studied and building sites are visited. Uniform building regulations are covered, fire engineering is examined, and basic plumbing is taught.

BS192 Introductory Law
Two hours per week for one semester
A first year subject in the diploma course in applied science (environmental health).
An introduction to the Australian legal system and to basic concepts of law. The sources of law, the main branches of law, the administration and enforcement of the law, the doctrine of precedent.
An introductory analysis of public participation in the legislative, administrative and judicial processes.
The application of techniques of statutory interpretation to legislation affecting the environment, e.g., Clean Air Act, 1958 Extractive Industries Act, 1966 Navigable Water (Oil Pollution) Act 1960.

BS293 Law
Three hours per week for one semester
Prerequisite, BS192
A second year subject in the diploma course in applied science (environmental health).
The law relating to procedure and evidence with particular reference to Magistrates' courts, professional conduct and ethics in court.

BS390 Law
Sixty-three hours in one semester
Prerequisite, BS293
A third year subject in the diploma course in applied science (environmental health).

BS395 Managerial Economics
Three hours per week for two semesters
A final year subject in the diploma course in applied science.
The course involves the development and integration of concepts and principles from the fields of management theory, economics and accounting with particular reference to decision-making and policy formulation within the modern industrial firm.

Textbooks
Webber, R.A. Management. Homewood, Ill, Irwin, 1975

References
To be advised by lecturer.

BS495 Business Studies
Four hours per week for one semester
A final year complementary study for degree students
This subject develops and integrates concepts and principles from various fields of economics, accounting and business administration, where they assist management decision-making and policy formulation within the firm.

BS497 Office Systems and Administration
One hour per week for one semester
A final year subject in the diploma course in applied science (environmental health).
A study of office procedures and administrative principles applicable to municipal and other public bodies. Particular attention will be given to record-keeping and its relevance to evidence for prosecutions.
BS499  Law
Sixty-three hours in one semester
Prerequisite, BS390
A final year subject in the diploma course in applied science (environmental health).
Conservation and control of land use. A consideration of the Town and Country Planning Act 1968 and natural resources legislation, and legislation relevant to the task of a Health Surveyor. Practical comparative case studies on all aspects of environmental law together with recent developments overseas.

CE223  Town and Country Planning
Two hours per week for one semester
A second year subject in the diploma course in applied science (environmental health).
An introduction to town-planning techniques, Victorian planning structure and legislation, map techniques, the preparation of planning data, regional concepts, neighbourhood planning. The practical-tutorial work will include visits to new development sites within the metropolitan area and an introduction to the preparation of planning reports.

References
To be advised by the lecturer.

CE235  Health Engineering
Three hours per week for one semester
A second year subject in the diploma of applied science (environmental health).
This subject gives the student a practical understanding of urban drainage design methods.

Hydrology

Hydraulics
Energy equation for flow of ideal fluids, Bernoulli's equation, continuity of mass, energy forms, application to simple examples, chutes, Pitot tube, orifices. Weirs — rectangular, vee-notch, Cippeletti, submerged, broad-crested.

Drainage
Pipes — capacity, location, installation, grades, sizes, materials. Pipe flow formulae, use of charts for pipe selection. Introduction to drainage system design. Open drains — Manning's formula, typical cross section for various linings, appropriate roughness coefficients, bed-slopes.

Sewerage

References
To be advised by the lecturer.

CE401  Health Engineering
Three hours per week for one semester
A final year subject in the diploma of applied science (environmental health).

Water supply

Soil mechanics
Introduction, soil properties, classification systems, laboratory and field identification and classification. Groundwater flow; total head concepts in steady flow, Darcy's Law, soil permeability, isotropic flow-nets, examples of steady two-dimensional seepage. Introduction to slope stability analysis.

Solid waste disposal
Volumes and composition of solid wastes from domestic, commercial and industrial sources; collection, transport and disposal methods; sanitary landfill, incineration, pyrolysis, composting.

Stream pollution
Sources and nature of polluting substances, effect on bodies of natural water, oxygen balance. Streeter-Phelps equation.

Surveying
Introduction to levelling, measuring and setting out. Basic computation techniques. Surveying instruments, uses and adjustments. Practical classes showing application of instruments.

References
To be advised by the lecturer.

EA122  Industrial Processes (Introduction)
One hour per week for one semester
A first year subject in the diploma course in applied science (environmental health).
An introduction to industry with special reference to selected industries; the handling and storage of raw materials, intermediate and finished products, waste products and by-products; industrial flow diagrams; toxicity, health and safety problems, health and safety precautions.

Prescribed text

EA223  Industrial Chemical Processes
Three hours per week for one semester
Prerequisite, EA122
A second year subject in the diploma course in applied science (environmental health).
A study of the processes involved in industrial chemical processes with special attention to by-products and/or waste flows. The course comprises —

(a) Industrial chemistry. Transport of materials — solids, liquids, gases — size reduction, mixing, mechanical separation, heat transfer, evaporation, mass transfer, distillation, absorption, liquid — liquid extraction, leaching, adsorption, ion exchange, crystallisation, drying, chemical process reactions.

(b) Water and waste water treatment. Treatment of water for process use — chemical, ion exchange, etc. — treatment of waste water — sedimentation, coagulation, filtration, ion exchange, biological processes such as activated sludge, trickling filters, etc, water cooling, humidification, dehumidification etc.
Faculty of Applied Science

(c) Air pollution control. Dust removal by sedimentation, bag filters, cyclone separators, electrical precipitators, dust washers, venturi scrubbers, etc. Odours and toxic materials will be discussed briefly as a preparation for study later in the course.

**EA321 Industrial Processes**
Three hours per week for one semester
Prerequisite, EA223
A third year subject in the diploma course in applied science (environmental health).
A continued study of the processes involved in industrial chemical processes with special attention to by-products and waste flows. The subject comprises
(a) Industrial chemistry — description of some major industries and their environmental problems
(b) Case histories from industrial experience
(c) Discussion of relevant environmental problems of current public interest
(d) Introduction to industrial safety and hygiene in chemical plants.

**ED102 Engineering Drawing and Sketching**
Three hours per week for one semester
Prerequisite, ED101
A first year subject in the diploma course in applied science (environmental health).
The course gives the student a sound basic knowledge of the principles of engineering drawing and sketching. Exercises are selected from the areas of interest to health surveyors and topics include equipment and plans for heating, ventilation, lighting, air-conditioning, refrigeration, fire protection, drainage, waste treatment and disposal, building construction, pumps, pipework, etc. In addition to drawing exercises completed by students, sets of industrial drawings are studied to give experience in the interpretation and understanding of procedure and practice.

**ED420 Devices and Circuits**
Sixty hours in one semester comprising approximately forty hours of lecture/tutorial work and twenty hours of laboratory work.
A subject of semester one of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
This subject provides a review of the electronic fundamentals necessary for the appreciation of more advanced electronic instrumentation.
Electrical circuit elements and circuits: behaviour of circuit elements; electrical network analysis; electrical measurements and instruments.
Electric circuit responses: initial state and voltage step responses of first order circuits; phasors, impedance and AC circuit behaviour.
Operational amplifiers: characteristics and applications in simple configurations.
Semiconductor devices and applications: junction diode characteristics and application to rectifying, clipping, clamping and logic circuits; field effect and junction transistor characteristics and application in simple low frequency amplifiers.
Power supplies; capacitor input and choke input filters; Zener diode regulators; voltage doubler circuits.
References

**ED421 Digital Electronics**
Seventy hours in one semester, comprising approximately thirty-five hours of lecture/tutorial work and thirty-five hours of laboratory work.
A subject of semester two of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.
Switching transistors, IC logic families, binary signals. Logic gates, truth tables, Boolean logic, combinational logic circuits. MSI and LSI combinational logic devices and applications. Flip flops, synchronous and asynchronous systems. MSI and LSI counters, registers and memory devices. Logic state machines. Digital to analogue and analogue to digital conversion. Serial and parallel data transmission, data buses. Microprocessor introduction.
References
Malmstadt, H.V. and Encke, C.G. *Digital Electronics for Scientists*. N.Y., Benjamin, 1969
Substantial use will also be made of component manufacturers’ information.
EE520  **Programming Dedicated Processors**

Forty hours in one semester, comprising approximately twenty hours of lecture/tutorial work and twenty hours of laboratory work.

A subject of semester three of the graduate diploma courses in biomedical instrumentation and scientific instrumentation.

An introduction to computers, minicomputers, microcomputers and microprocessors. Philosophy and architecture of stored program controlled computers for on-line control and monitoring applications.

Basic language programming for dedicated microcomputer/minicomputer applications.

Assembly language and machine language program development for dedicated microprocessor applications.

Survey of available processors.

**References**


Substantial use will also be made of various manufacturers' literature.

**ME349  Environmental Engineering**

Three hours per week for one semester

A third year subject in the diploma course in applied science (environmental health).

Topics covered include

(a) Mechanical engineering plant. Principles and standards to be met by heating, ventilating, lighting, air-conditioning, refrigeration, steam and high pressure hot water plants, stand-by power plants, combustion and boiler plant tests on boiler plants such as the Ringleman, 

(b) Vibration and acoustics, environmental noise control

**ME449  Environmental Engineering**

Three hours per week for one semester

A final year subject in the diploma course in applied science (environmental health).
Academic staff ........................................ AR2

Courses offered in Graphic Design
Undergraduate
— Diploma in Graphic Design .................... AR3
— Degree in Graphic Design ...................... AR3
— Subject details .................................... AR5

Courses offered in Film and Television
Undergraduate
— Diploma in Film and Television ............ AR4
— Graduate Diploma in Film and Television .... AR4
— Subject details .................................... AR7
General information ................................. G1
Faculty of Art
Dean
I. McNeileage, DipArt, TTTC

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J. Harris, DipArt

Lecturers
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B. Coyne, BSc, DipEd
A.M. Evans, BAgicSc, DipAgricExt
P. Tammer, BA

Art courses offered
Full-time courses in the Faculty of Art are offered in the following areas:

Graphic Design (degree) 4 years cooperative
Graphic Design (diploma) 3 years full-time
Film and Television (diploma) 3 years full-time
Applied Film and Television 1 year full-time (graduate diploma)

Undergraduate courses: degree, diploma
 Applicants must have passes in any four Higher School Certificate subjects or have the equivalent qualifications. Selection tests and interviews will be conducted in December to qualify for entry. All applicants who specify an art course, either graphic design or film and television at this institute, must follow carefully the procedure for enrolment, which is given with dates etc. in the Victorian Universities Admissions Committee ‘Guide for Prospective Students’. This will be published in September, and distributed to all secondary schools, or will be available on application to the Victorian Universities Admissions Committee, 11 Queens Road, Melbourne 3004, telephone 267 1877. Please refer to ‘application procedure’, in the general section of this handbook.

Applications for second year and higher must be made direct to the institute and not through VUAC.

Assessment
Each year of the course is taken as a whole and in order to qualify, an overall pass must be obtained on the year's work. A faculty pass may be awarded in the event of failure in one theory subject.

The only exception is in the final year of the diploma or degree course, where individual subjects may be repeated with the approval of the Art Faculty Board.

If the subject or subjects are not successfully completed within two years, the complete set of final examinations must be attempted again.

Examinations
Students must enter for all subjects in a particular year of the course except where an exemption has been approved or electives offered.

The form of the examination and the content of the folio work (assigned projects) will be determined by the panel of examiners and moderators appointed by the Art Faculty Board.

General conditions
The institute reserves the right to retain any work executed by students as part of their course studies. Work not required by the institute may be claimed by the student when it has been assessed.

The Art Faculty Board is the final authority for deciding passes or failures in any of the examinations for the Faculty of Art.
**Diploma course in Graphic Design**

The aim of the diploma course is to train designers to work effectively in areas where information is conveyed by visual means, such as advertising, publishing, publicity, printing, merchandising, education and some research projects. The course is planned to produce imaginative designers, who, with specialisation and experience in industry, should achieve positions commensurate with their individual talents.

The first two years of the course are common to each of the diploma/degree streams but in the final diploma year, a number of special bias studies are offered, including photography, three-dimensional design, audio-visual and publication design.

**Course structure**

Each subject is of 2 semesters’ duration.

<table>
<thead>
<tr>
<th>Semester hours</th>
<th>Subjects to be taken by part-time study:</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>AT395 Applied Psychology</td>
</tr>
<tr>
<td>34</td>
<td>AR321 Print Technology</td>
</tr>
<tr>
<td>34</td>
<td>AR303 Industrial Year</td>
</tr>
<tr>
<td>34</td>
<td>AR341 Result of Studies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subjects to be taken by full-time students:</th>
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<tbody>
<tr>
<td>306</td>
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<tr>
<td>51</td>
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<td>34</td>
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</tbody>
</table>

**Degree course in Graphic Design**

The aim of the degree course is to meet the present and future needs of industry, and to train people with a high degree of creative ability for positions of administrative responsibility in the areas of direction and production of printing, publishing, advertising, educational and information design.

At the completion of the second year, students are selected for the degree course. They are required to spend the whole of the third year working in an industrial situation organised by the institute. This arrangement conforms to the Y structure under the cooperative education system. This third year will enable the student to begin professional practice and is supervised by senior staff.

During the year in industry, students will be required to attend the institute for two sessions per week for theoretical subjects: Print Technology and Psychology.

In the final year, in addition to Assigned Projects 4, Business Administration and Communication Theory subjects will be studied in the institute.

**Degree course in Graphic Design**

The aim of the degree course is to meet the present and future needs of industry, and to train people with a high degree of creative ability for positions of administrative responsibility in the areas of direction and production of printing, publishing, advertising, educational and information design.

At the completion of the second year, students are selected for the degree course. They are required to spend the whole of the third year working in an industrial situation organised by the institute. This arrangement conforms to the Y structure under the cooperative education system. This third year will enable the student to begin professional practice and is supervised by senior staff.

During the year in industry, students will be required to attend the institute for two sessions per week for theoretical subjects: Print Technology and Psychology.

In the final year, in addition to Assigned Projects 4, Business Administration and Communication Theory subjects will be studied in the institute.
**Diploma course in Film and Television**

The aim of the course is to provide professional training for people wishing to make a career in the film and television industries of this country. The course aims to foster craft and conceptual skills allied to script writing, directing, producing, editing, sound recording, lighting and camera operation.

**Course structure**
Each subject is of 2 semesters' duration.

<table>
<thead>
<tr>
<th></th>
<th>Semester hours</th>
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<tbody>
<tr>
<td><strong>First year</strong></td>
<td></td>
</tr>
<tr>
<td>AR151 Assigned Projects 1</td>
<td>340</td>
</tr>
<tr>
<td>AR161 History of Arts 1</td>
<td>34</td>
</tr>
<tr>
<td>AR141 Script Writing 1</td>
<td>34</td>
</tr>
<tr>
<td>AR171 *Result of Studies 1</td>
<td></td>
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<tr>
<td><strong>Second year</strong></td>
<td></td>
</tr>
<tr>
<td>AR251 Assigned Projects 2</td>
<td>340</td>
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<tr>
<td>AR261 History of Arts 2</td>
<td>34</td>
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<tr>
<td>AR241 Script Writing 2</td>
<td>34</td>
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<tr>
<td>AR271 *Result of Studies 2</td>
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<tr>
<td><strong>Third year</strong></td>
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<tr>
<td>AR351 Assigned Projects 3</td>
<td>340</td>
</tr>
<tr>
<td>AR361 History of Arts 3</td>
<td>34</td>
</tr>
<tr>
<td>AR365 Methods of Production</td>
<td>34</td>
</tr>
<tr>
<td>AR371 *Result of Studies 3</td>
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</tbody>
</table>

*Note: Results will be published for each subject and for the year as a whole.*

*Result of studies is not a subject, but is a clear-cut decision on the student's total success or otherwise in the year's studies (see under 'Assessment').

**Graduate Diploma in Applied Film and Television**

This course is offered to graduates who want to make objective use of film, television or animation production skills.

**Aims and objectives**

1. To provide a practical course in film, video, or animation production, for applied commercial, industrial or educational purposes.

2. To promote the objective use of these media in order to communicate information to defined audiences.

*Note*  
The course serves areas such as communications media, education (including re-training), public relations, advertising, social welfare and audio-visual services.

**Course structure**
One year full-time.

<table>
<thead>
<tr>
<th></th>
<th>Semester hours</th>
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<tbody>
<tr>
<td>AR400 Assigned Projects (2 semesters)</td>
<td>340</td>
</tr>
<tr>
<td>AR401 Result of Studies</td>
<td></td>
</tr>
</tbody>
</table>
Diploma/Degree in Graphic Design

First year

AR101  Assigned Projects 1
Twenty hours practical per week for two semesters
Prerequisite, nil
Assessment is continuous

Assigned projects refer to a co-ordinated three-year work program with specific emphasis on a creative approach to solving communication problems principally of a graphic nature. Students are encouraged to develop their own personal style through soundly reasoned, skilfully-executed assignments and to communicate the solutions in a way most likely to ensure acceptance and successful implementation. Group assignments also allow students to develop a broader understanding and appreciation of other students' particular abilities.

A sequential program of applied design and communication projects is directed at developing a general awareness of visual aspects of the students' environment and facility for critical objective analysis.

Specific study areas include:

Design
The object is to equip students with a 'design vocabulary' to allow creative expression in areas of two and three dimensions. As the year progresses, design projects increasingly interact with drawing, photography and design for print. In this way students develop an appreciation and competence over a broad range of communication problems, while the development of special individual interests is also provided for.

Photography
A comprehensive introduction to still-photography as a creative medium aimed at cultivating visual awareness in the student through study of controlled lighting, spatial relationships, form, product and fashion photography, photo-journalism, photo-reproduction techniques (e.g. developing and printing), pictorial editing, various colour processes and costing.

Design for print
Introduction to a comprehensive study over the three years of the course, which includes reproduction of lettering, typographic and symbol design, illustration, and all aspects of production with particular emphasis on experimental work in offset lithography and screen printing.

Drawing and technical illustration
Expanding vision through assignments which develop control of drawing as a discipline for research and invention. Subject matter includes the figure, perspective, object drawing and natural forms.

References
Campbell-Drury, A. Photography Notes. Swinburne College Press
The Partners of Pentagram. Living by Design. Lond., Lund Humphries, 1978

AR111  History of Arts 1
Two hours per week for two semesters
Prerequisite, nil
Assessment is continuous

A course of study planned to create an awareness and appreciation of a variety of art forms in selected periods and to provide a background for communication arts.

AT193  Applied Writing
Two hours a week for one semester
Assessment is continuous, based on class participation and practical work

A first year subject for all graphic design students. The course is designed to develop formal and creative writing skills appropriate to graphic design. Attention will also be given to the analysis and interpretation of written and visual material, clarity and accuracy in the presentation of ideas, and writing techniques employed in applied areas, such as copy writing, design rationale and publications.

BS193  Typewriter Keyboard Training
Three hours a week for one semester
Assessment is continuous, based on a series of test exercises

A course of one semester duration, designed specifically for basic and accurate keyboard familiarity to facilitate organised written assignment work, and later conversion to the electric direct impression and computer phototypesetting systems used in the second and third year of the course.

Second year

AR201  Assigned Projects 2
Twenty hours practical per week for two semesters
Prerequisite, AR140, Result of Studies 1
Assessment is continuous

This program constitutes a bridge between the formative studies of the first year and the closely-applied studies of third year. The aim of the second year is to bring the student to a professional standard of competence in the illustrative, typographic, written and oral presentation of ideas, in the arrangement of sequential information embracing publishing, advertising, sales promotion, merchandising and public relations, also for non-commercial areas such as education and community organisations. Study areas include — design, photography, methods of production, typography, history of arts and sociology. Instead of studying these subjects in isolation, the aim is to integrate them into composite communication problems wherever possible.

Methods of production
A comprehensive study of photo-mechanical and direct printing procedures. Photo-engraving, letterpress, offset lithography, rota-gravure, silk-screen, type identification, indication and specification, the point system, copy-casting, proof-reading, copy preparation techniques, practical exercises in direct impression typesetting for book, advertising and display typography.

AR211  History of Arts 2
Two hours per week for two semesters
Prerequisite, AR140 Result of Studies 1
Assessment is continuous

A study of the influences within the arts in contemporary society including aspects of stylistic development within the graphic arts.
**AT294 Social Science 2**
Two hours per week for two semesters
Assessment is continuous

**Social science and communications**
The subject is designed to develop social science and communication skills which are related to graphic design. The social science element provides information about Australia's social profile and this is integrated with the development of written and oral communication skills, especially those complementary to graphic design. A further development is based on a particular inter-relationship between social science and communications, i.e., social research.

A number of social groups are examined and used as the basis for a communications exercise both oral and written. Written communications skills include the writing of objectives, working out rationales, planning a schedule, writing reports and submissions, and writing copy. Oral skills include interviewing, responding, non-verbal language and assertiveness training.

Social research techniques to be examined include defining populations, sampling, defining the characteristics of target populations, creating a questionnaire, interviewing and desk research. Students are required to put these techniques into practice and in doing so become aware of the applications of social survey skills to market research. Students also have the opportunity to rest the response of the public in relation to their own design work through exercises in community service promotions as part of AR201 Assigned Projects 2.

**Diploma in Graphic Design**

**Third year**

**AR301 Assigned Projects 3**
Twenty hours per week for two semesters
Prerequisite, AR240 Result of Studies 2
Assessment is continuous

The final year student is encouraged to move towards one of the main studies with the aim of producing solutions to advanced problems of communication design at a professional level, e.g., advertising design in various graphic media, publication design, corporate image design or educational technology. Special bias studies are offered, including photography, three-dimensional design, audio-visual and publication design.

**AR320 Methods of Production 3**
Two hours per week for two semesters
Prerequisite, AR240 Result of Studies 2
Assessment is continuous

Advanced studies of photo-mechanical and direct-printing procedures. Photo-engraving, letterpress, offset lithography, rotogravure, silk screen, type identification, indication and specification, the point system, copy-casting, proof-reading, copy preparation techniques, practical exercises in direct impression type-setting for book, advertising and display typography. Cost estimating, mechanical art procedures, production control, paper consideration. Visits to production houses are arranged.

**AT391 Applied Psychology**
Two hours per week for two semesters
Prerequisite, AR240 Result of Studies 2
Assessment is continuous

A third year diploma subject which aims to increase personal and social skills through the study of communications. This will include learning models, assertiveness training, stress management and sensory and interpersonal perception.

**Preliminary reading**
Reading and other resources will be given where appropriate.

**Degree in Graphic Design**

**Third year**

**AR321 Print Technology**
Two hours per week for two semesters
Prerequisite, AR240 Result of Studies 2
Assessment is continuous

Investigations into the theory and application of modern print technology. It is not intended that this course will go deeply into the electronics, mechanics or chemistry of printing, but rather explore the possibilities for design, production and distribution created by modern reproduction methods. These include type composition, photo-mechanical processes (offset, screen, letterpress and gravure), electrostatic and heat transfer. Studies of paper and other stock.

This course will include the economics of production and relate to sections of the course in business administration.

**AT395 Applied Psychology**
Two hours per week for two semesters
Prerequisite, AR240 Result of Studies 2
Assessment is continuous

A third year degree subject, which introduces the student to the study of psychology and those areas relevant to marketing and advertising. It aims to have students demonstrate a knowledge of concepts and research in psychology and to help them understand the application of psychology to the area of marketing. It also aims to have students show an understanding of human needs and motivation by the analysis and creation of effective persuasive material. This is to be achieved by individual research projects on relevant areas of psychology and marketing for the first semester, and the psychological analysis of media material in second semester.

**AR303 Industrial year**
Eighteen hours per week for two semesters
Prerequisite, AR240 Result of Studies 2
Assessment is continuous

(See ‘Y’ chart).

** Fourth year**

**AR410 Assigned Projects 4**
Eighteen hours per week for two semesters
Prerequisite, AR341 Result of Studies 4
Assessment is continuous

Working in a professional atmosphere, emphasis is given to developing the student's special capabilities through assigned professional projects or self-defined problems, culminating in a major design statement.
BS492  Business Administration
Three hours per week for two semesters
Prerequisite, AR341 Result of Studies 3
Assessment is continuous

The aim of this subject is to introduce students to the major bases and problem areas of the modern firm.
It consists of two sections, the first dealing with economic and accounting concepts as they influence managerial decision-making. The second section is concerned with marketing and organisational behaviour. It relates to problems of decision-making in the administration of people and in the formulation of marketing programs.

AT492  Theory of Communications
Two hours per week for two semesters
Prerequisite, AR341 Result of Studies 3
Assessment is continuous

The subject is a practical introduction to the wide range of written and spoken communications used by the graphic designer. Topic areas include reference to the spoken and written word, information sources, information reduction, originality and innovation, writing copy, headlines and captions, words and music, use of background sound, product identity, use of humour, names and naming. Complementary topics include: importance of the press in advertising, institutional public relations, advertising models, definitions of advertising, sales promotion, marker research, controversy advertising, and communications in the agency.

A thematic approach is adopted that is stimulating and thought-provoking. This method also serves as a useful problem-solving model immediately applicable to the professional work situation. Each session has a theme similar to an actual work assignment.

Film and Television subject details
Diploma in Film and Television
First year

AR151  Assigned Projects 1
20 hours practical per week for two semesters
Prerequisites, nil
Assessment is continuous

In the first semester students undertake the production of short exercises in order to gain an understanding of television production techniques. Working in groups and by rotating roles, each student experiences the responsibilities of directing, vision mixing, sound recording and mixing, lighting, camera operation, videotape operation, design, graphic design, location production, floor managing and video editing.

In the second semester, each student assumes the responsibility for the script of one major and one minor production. The students form crews for these productions and it is possible for the individual to begin to specialise in production roles such as camera operation, sound recording, etc.

AR161  History of Arts 1
Two hours per week for two semesters
Prerequisites, nil
Assessment is continuous

The history of film is explored through lectures and the screening and discussion of selected classics. Students contribute to the presentation of information in formal sessions and also submit written assignments on set topics. Some study is made each year of specialist areas of the film medium, e.g. music, design, etc.

AR141  Script Writing 1
Two hours per week for two semesters
Prerequisites, nil
Assessment is continuous

Students first acquaint themselves with various genres of TV writing — news, current affairs, documentary, comedy, commercials and drama. In the second semester they are then introduced to the basic elements which govern writing for the screen — light, sound, movement, time, dramatic form, characterisation and content.

Second year

AR251  Assigned Projects 2
20 hours practical per week for two semesters
Prerequisite, AR171 Result of Studies 1
Assessment is continuous

During the first semester students undertake introductory studies in film technology and production covering directing, lighting, camera operation, wild and synchronous sound recording, mixing and laying sound tracks, editing, producing, titles, continuity, A and B roll negative matching, sensimetry and laboratory services.

During the initial short exercises the students gain technical control of the medium before embarking upon more complex group productions. They change their roles from production to production until they are familiar with all the major production functions.

For the first half of the second semester, second year students crew for third year students, gaining experience working on relatively ambitious projects for which large crews are sometimes required.

During the last eight weeks of the year the students produce three productions based on scripts selected from the Script Writing 2 component. It is expected that these productions should demonstrate technical and artistic competency well in advance of first semester work.
AR261  History of Arts 2  
Two hours per week for two semesters  
Prerequisite, AR171 Result of Studies  
Assessment is continuous  
In second year this subject relates principally to the history of film, including the evolution of genres.  
Representative classics and more recent films are screened and discussed. Students present criticisms of these films in written form.

AR241  Script Writing 2  
Two hours per week for two semesters  
Prerequisite, AR171 Result of Studies  
Lectures cover the basic principles of dramatic structure such as the choice of theme, characterisation, character development, action, point of attack, orchestration, conflict, climax and resolution. Points made are related to the major film genres.  
Students are encouraged to write short scripts with the possibility of theirs being produced as assigned projects.

Third year

AR351  Assigned Project 3  
Twenty hours practical per week for two semesters  
Prerequisite, AR271 Result of Studies  
Assessment is continuous  
In the final year the student is concerned with eight 'units' of production involvement given the following options:  
- Script writing  
- Directing  
- Lighting/camera/titles  
- Continuity/editing/neg. matching  
- Producing  
- Sound recording/mixing  
- Art direction/graphics/stills  
For production purposes film or video students are encouraged to function as a crew. It is possible for the individual to begin to specialise with regard to the options above.  
The content of programs is not specified. Style and duration are determined in part by the resources and budget available.  
In the final year the student may work in film or television.  
The institute usually meets all assigned project costs and provides associated equipment.

AR361  History of Arts 3  
Two hours per week for two semesters  
Prerequisite, AR271 Result of Studies  
Assessment is continuous  
These studies require the student to undertake the critical appreciation of a 'school' of film making or the achievement of a distinguished director and to prepare a 3000 word essay on the subject.

AR365  Methods of Production 3  
Two hours per week for two semesters  
Prerequisite, AR271 Result of Studies  
Assessment is continuous  
The student is required to prepare a 2000 word essay on an aspect of contemporary film or television production, selecting a topic from a list stipulated by the lecturer.

Graduate Diploma in Applied Film and Television

AR400  Assigned Projects  
Twenty-one hours per week for two semesters  
Prerequisite, first degree or diploma in any discipline  
Assessment is continuous  
All three streams of study (film, television and animation) have a similar basic structure. Students are introduced to writing and production skills in the first semester and then undertake individual productions in the second semester. With regard to the latter, each student is responsible for the script, direction and editing.

Semester 1  
Script development  
Sixteen weeks at three hours per week  
These studies deal with the nature of the medium, critical and creative theory and the identification of a topic, an audience and a purpose.  
Short exercises lead to the writing of a script for production in the second semester.

Production techniques  
Sixteen weeks at eighteen hours per week  
Lectures, demonstrations and practical exercises, leading to technical control of the medium.

Semester 2  
Production  
Sixteen weeks at twenty-one hours per week  
Each student, assisted by a student crew as required, directs the script they have written in the first semester.  
Finished programs are presented to 'real' audiences and their effectiveness assessed.  
Note  
Despite the pragmatic objectives of the course an innovative approach is often essential if information is to be imparted effectively.  
There is no restriction of the subject areas that may be investigated provided there is an associated audience.

References  
Lipton, L. Independent Filmmaking. Lond., Studio Vista, 1974  
Millerson, G. The Technique of Television Production. Lond., Focal Press, 7th edn, 1970
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Faculty of Arts

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Sub-Dean
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Faculty Secretary
Elizabeth A. Williams, BA, DipCrim

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Arts courses offered
Diploma of Arts
Bachelor of Arts
Graduate Diploma in Applied Social Psychology
Graduate Diploma in Urban Sociology

Three-year undergraduate diploma and
degree courses

Structure
Initially all students are enrolled in subjects common to both degree and diploma courses. On completion of the equivalent of two years of full-time study, some students are selected to proceed to Bachelor of Arts studies while others complete the Diploma of Arts.

Full-time
Both the diploma and degree courses require three years of full-time study, during which a unit value of twenty-four must be accrued.

Part-time
Many students undertake their courses by part-time study. At the rate of four units per year, it would usually take six years to gain a unit value of twenty-four, but this time may vary according to the study time available to the student.

Career opportunities
The course is designed to develop skills in the collation and analysis of information, a high level of competence in various specialised oral and written forms of communication and an ability to apply theoretical concepts in the search for practical solutions to problems. Students may select courses which will be of particular value in following a career in such fields as: administration, personnel, publishing, public relations, and research services. After further short-term courses graduates may gain qualifications to become, for example, practising psychologists, urban sociologists, teachers or librarians.

Eligibility
Applicants in the following categories will be considered for admission to the Arts degree/diploma course, although quota restrictions may prevent offers being made to all eligible candidates:

- applicants with passes (D or above) in four Victorian Higher School Certificate (year twelve level) subjects, including English;
- applicants with equivalent interstate or overseas studies;
- applicants who have successfully completed an approved tertiary orientation program, including English; and
- mature-age applicants without the formal qualifications listed above, who have the ability to cope with tertiary study. The minimum age for these applicants is twenty-one years.
Applications
 Applicants seeking a full-time place in the Arts course must apply through the Victorian Universities Admissions Committee. Application for a part-time place must be made directly to the college.

Prospective students should ascertain the relevant closing dates for applications in September or early October of the year preceding that in which they would like to commence studies.

Deferred entry
 Students who have been offered a place in the Arts degree/diploma course for the first time may apply to defer their entry to the course for up to one year. Applications should be made in writing to the Registrar as soon as the offer of a place is received.

When an application is approved the student concerned will be notified in writing by the Faculty Secretary. Usually, deferments will be valid for a maximum period of one year and only for entry to the course for which the offer was made.

Course requirements
 Diploma requirements
 In order to complete a diploma, a student must:
(a) have gained a unit value totalling twenty-four from stages one, two and three;
(b) complete either two majors, or one major plus two minors;
(c) major in one of the following: Italian, Japanese, Media Studies, Political Studies, Psychology, Sociology.

Degree requirements
 In order to complete a degree, a student must:
(a) have applied and been selected for stage three studies at degree level (see section on ‘degree selection’);
(b) have gained a unit value totalling twenty-four, from stages one, two and three;
(c) gain passes to the value of at least six units in stage two subjects approved for the purpose;
(d) complete two majors in subject areas which have stage three degree approval, one of which must be Italian, Japanese, Media Studies, Political Studies, Psychology or Sociology. The second major may be chosen from this group or from Historical and Philosophical Studies, Literature or Economics.

Note:
 Students who enrolled for the first time before 1976 may be eligible to count exemptions towards their stage two unit value.

Requirements applicable to both diploma and degree courses
 Students in their first year, who choose not to take any language studies, are strongly encouraged:
(a) if full-time, to select their eight semester subjects from at least six different subject areas;
(b) if part-time, to select their four semester subjects from at least three different subject areas.

Unless special permission is granted, students should:
(a) include no more than ten stage one semester subjects in a diploma/degree;
(b) include no more than two majors in a diploma/degree.

Degree selection
 Essentially, it is at stage three of these courses that degree and diploma studies are differentiated. To be eligible for degree selection a student must have passed the prerequisites for the proposed stage three degree subjects. Applications for degree selection will be received in October each year, for the following academic year. Students who hope to begin stage three degree studies at the beginning of the second semester of a year need to apply for degree selection in the previous October. Applications, on the appropriate form, must be lodged at the Faculty of Arts office (BA915) by 31 October.

Usually, students enrolling for stage three degree studies will enrol for the diploma and degree stage three subjects under the appropriate codes. Students converting a diploma to a degree must consult course advisers about their enrolment.

Terminology
 ‘Course’ — refers to the total of selected subjects in a complete diploma or degree.

‘Subject area’ — refers to the category under which specific major/minor studies are grouped (e.g. psychology, literature).

‘Semester subject’ — refers to a single half-year unit of study.

‘Full-year subject’ — refers to either two consecutive half-year units, or one subject extending over one year.

‘Unit value’ — the value attached to a particular subject, either full-year or semester.

Studies constituting major strands: Majors
 A major study, normally restricted to a single subject area, is one comprising a full year of study at stage three and stage two, preceded by either a full year or semester subject at stage one.

In economics, Italian, Japanese, psychology and sociology, majors must include a full year of study at stage one as well as at higher stages. In other Arts subjects, historical and philosophical studies, literature, media studies and political studies, majors may be constructed with only one semester subject at stage one.

At each of stages two and three, one full-year subject or a pair of semester subjects are required to build a major sequence.

In special cases a sequence of studies may be selected from two related subject areas to constitute a major. An integrated major from the subjects offered in the historical and philosophical studies area may form part of a diploma or a degree course. Before students begin a mixed major, they must obtain the approval of the relevant head or chairman of department.

Studies constituting minor strands: Minors
 A minor study usually comprises a full year of study in a subject at stage two, preceded by either a full year or semester of study at stage one.
Course progress and unit values

Exemptions
Students with certain recognised tertiary qualifications may be granted a reduction in the total unit value after applying to the Arts Faculty Board. In special cases, exemptions from named full-year and/or semester subjects are allowed, but more often exemptions simply provide for a reduction in the total unit value to be studied. Students who think they may be eligible should apply for exemptions soon after they first enrol, presenting documentary evidence of their prior qualifications. See also ‘Exemptions’ in the general information section of this handbook.

Teachers in the Victorian Education Department are advised to consult the Teachers Tribunal about seeking exemptions from degree and diploma courses on the basis of teacher training qualifications, as the Tribunal has previously indicated that such claims would not meet with its approval.

Full-time students
(a) A full-time student is usually required to enrol in sufficient subjects to gain a unit value of eight in one year. In special circumstances, permission may be granted to vary this requirement on application to the Dean or Sub-Dean of the Faculty.
(b) In each year of study full-time undergraduate students are expected to gain passes totalling a unit value of at least six. After two years at the college, a full-time student is expected to have gained a unit value of at least twelve to be eligible to continue full-time study in the following year.
(c) A full-time student who wishes to enrol for more than the usual number of subjects in any semester is required to apply in writing to the Dean or Sub-Dean, giving reasons for the request.

Part-time students
(a) A part-time student is usually required to enrol in sufficient subjects to gain a unit value of four in one year. Permission may be granted to vary this requirement on application to the Dean or Sub-Dean of the Faculty.
(b) A part-time student will be considered to have made satisfactory progress if he or she has achieved passes totalling a unit value of three.

Progress through the course
A student who fails to meet the foregoing requirements may be re-enrolled only after discussion with the Progress Review Committee.

A student who has been recommended for exclusion from the course may appeal in writing, within a time specified by the Dean, Faculty of Arts, to the convener of the Progress Review Committee for special consideration.

The general criteria for an appeal are as follows:
(a) the student must convince the committee of genuine grounds for the request;
(b) past academic standard must indicate a capacity to complete the course.

A student who feels aggrieved by the decision of the Progress Review Committee may appeal to the Dean.

Amendment to enrolment
Students may amend their subject selection by attending an Amendment Session and completing an Amendment to Enrolment form which must then be approved by the Dean (or nominee) of the Faculty of Arts. Amendment Sessions are held at pre-advertised times during the first three weeks of every semester. Students are not encouraged to enrol for a subject which has passed its introductory stages, so that, usually, admission to a subject three weeks after it has begun is not allowed.

Unless a student has lodged a completed Amendment to Enrolment form indicating withdrawal, by the date specified for each semester by the Registrar, a fail will be recorded against the subject or subjects the student has decided not to pursue. (See ‘Amendments’ and ‘Withdrawal from all study’ on pages IT4 and IT6.)

Leave of absence
Students who have enrolled in the Arts degree/diploma course and who wish to apply for leave of absence should lodge a completed Amendment to Enrolment form at the Student Records office or at the Faculty of Arts office (BA915).

When an application is approved the student concerned will be notified in writing by the Faculty Secretary. Enrolment in all subjects for the duration of the leave will be cancelled automatically.

A student who wishes to commence leave of absence after the end of the seventh week of the semester in which final assessment takes place (that is for subjects or units assessed in the first semester — Friday 3 April 1981 and for subjects or units assessed in the second semester — Friday 11 September 1981) will be recorded as having failed those subjects or units for which he or she was enrolled unless special permission to cancel the enrolment had been given by the head of the student’s awarding department or faculty.
Selection of course: majors, minors and subjects

The onus is on individual students (assisted by course advisers when enrolling) to have completed by the end of their stage three studies, a course which will entitle them to the award of a diploma or a degree.

Students choosing their majors have available a wide range of combinations (e.g., sociology with literature, psychology with historical and philosophical studies, politics with media studies, Japanese with political studies, and so on). In fact, most combinations are now possible, apart from historical and philosophical studies with literature, or either of these with economics.

When attending to enrol, students are issued with detailed instructions to assist in planning a suitable course. All students are required to complete enrolment forms (indicating their subject selection for both semesters) and, once approved, may not alter their enrolment without approval.

Appointments with course advisers during the semester may be made through the Faculty of Arts office (BA915).

Subject prerequisites

Prerequisites for subjects (both semester subjects and full-year subjects) are indicated in the details for the particular subject.

These prerequisites usually must be completed before students may take subjects from stages two and three. Any divergence from this requirement must have the approval of the lecturers concerned and the Dean, Faculty of Arts.

Time allocations per week

Each semester subject runs for an average of fifteen weeks. Usually in stage one a student spends approximately ten hours a week, including class time, on each semester subject studied. Most stage one and two subjects require three or four hours per week in class. Language subjects and stage three subjects require more.

Assessment and examination

The details of the methods of assessment for each subject are given by the lecturers in charge. Usually, a combination of progressive assessment and formal examinations is employed.

Reading lists

For preliminary reading and major texts in each subject, see under individual subject entries. Students are advised not to buy any texts until classes have met.

Subjects available for selection

Faculty of Arts subjects, together with information on unit values and prerequisites, are detailed under the headings of the faculty’s departments set out below.

Subjects are grouped according to departments within the faculty. This grouping should not weigh too heavily with students in planning their courses. Provided that course requirements are observed, and provided that places in classes are available, subjects may be selected from the full range. Some subjects are offered at one stage only, and for that reason cannot form part of a major or minor, e.g., Law and Society.

Department of Humanities

Historical and philosophical studies
Literature
Media studies

Department of Languages

Italian
Japanese

Department of Psychology
Psychology

Department of Social and Political Studies
Political studies
Sociology

Subject codes

Since 1980, new subject codes have been adopted. The prefix AT replaces the previous GS prefix for all subjects taught by the Faculty of Arts. The digits following the prefix reflect, in order, the stage at which the subject is offered, the stage area to which the subject relates, and the individual subject title. It is most important to refer to the correct subject code(s) when completing any Enrolment or Amendment to Enrolment forms.
Humanities

The Humanities department comprises three main subject areas — historical and philosophical studies, literature, and media studies.

Common degree/diploma subjects offered

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<thead>
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<th>Code</th>
<th>Stage 1</th>
<th>Unit Value</th>
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<td>Historical and philosophical studies</td>
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</tr>
<tr>
<td>AT105</td>
<td>Introduction to Problems and Methods of Philosophy</td>
<td>1</td>
</tr>
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<td>AT107</td>
<td>Theories of Nature and Life</td>
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<td></td>
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<td>AT120</td>
<td>Twentieth Century Literature</td>
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</tr>
<tr>
<td>AT122</td>
<td>Nineteenth Century Literature</td>
<td>1</td>
</tr>
<tr>
<td>AT130</td>
<td>Introduction to Communication Theory</td>
<td>1</td>
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<tr>
<td>AT132</td>
<td>Alternative course, literature/media studies</td>
<td>1</td>
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<tr>
<td>AT135</td>
<td>After Dada</td>
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</tr>
<tr>
<td>AT201</td>
<td>Historical and philosophical studies</td>
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</tr>
<tr>
<td>AT203</td>
<td>Mind, Language and Human Nature</td>
<td>1</td>
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<td>AT205</td>
<td>Social and Political Philosophy</td>
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</tr>
<tr>
<td>AT232</td>
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Diploma subjects offered

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<th>Code</th>
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<tbody>
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<td>Historical and philosophical studies</td>
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<td>AT304</td>
<td>Aesthetics, Education and Reason</td>
<td>1 1/2</td>
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<td>AT306</td>
<td>Science and Change</td>
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<td>AT320</td>
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<td>Writing for Radio and Television</td>
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<td>Communication and Human Behaviour</td>
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Degree subjects offered

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Historical and philosophical studies

The subjects offered under the heading of historical and philosophical studies draw on the traditional areas of philosophy, and history and philosophy of science. They are designed specifically for Arts students and are intended to introduce them to some of the important cultural and intellectual developments which have shaped our society. In the historical subjects the main emphases are those of the social historian and the historian of ideas, whereas the philosophical subjects pursue a conceptual approach to historical and contemporary issues.

No scientific or mathematical knowledge is presupposed in these courses.

Students may take majors which are basically history and philosophy of science or philosophy, or may choose a major which combines appropriate subjects from both areas.

An example of a major biased towards history and philosophy of science is AT107 or AT105, AT205, AT207, AT304, AT305, AT306, AT307. A philosophy-oriented major is AT101, AT201, AT203, AT301, AT302, AT304, AT305, AT306, AT307, and one of a variety of integrated majors might be AT101 and/or AT105, AT205, AT203, AT304, AT305, AT306, AT307.

Students are advised to examine carefully the prerequisites for stage three subjects before planning their courses.

Historical and philosophical subject details

AT101  Introduction to Problems and Methods of Philosophy
Four hours per week (three hours evening)
Pre requisite, nil
Assessment is continuous and by examination
An introduction to the problems and methods of philosophy. An examination of rationalist and empiricist traditions and the development of modern analytic schools of thought. Some basic principles of handling language and conceptual analysis; the application of such principles to specific problem areas such as: knowledge and perception, truth and falsity, human nature, moral judgements, the existence of God, religious concepts and the problem of evil.

Preliminary reading

Textbooks
Please consult with lecturer before buying textbooks

Recommended reading
AT105 Theories of Nature and Life

Four hours per week (three hours evenings)
Prerequisite, nil
Assessment is continuous

This subject is a study of some aspects of the scientific imagination and its revolutionary impact on our lives. Special attention is given to theories about the nature of life, e.g., theories of evolution and their significance for the debate about man's place in nature.

Preliminary reading
Asimov, I. The Wellsprings of Life. N.Y., New American Library, 1960

Textbooks
Please consult with lecturer before buying textbooks.

Recommended reading
Theobald, D.W. Introduction to the Philosophy of Science. Long., Methuen, 1969
Toulmin, S. and Goodfield, J. The Discovery of Time. Chicago, Midway, 1976

AT107 Theories of the Universe

Four hours per week (three hours evening)
Prerequisite, nil
Assessment is continuous

Ideas about the world and man's relationship to the universe. Within the general framework of social history the main emphasis is on the interaction of culture, civilization, social change, and science.

Major topics include: ancient societies, religion and science, concepts of the universe, theories and hypotheses.

Preliminary reading

Textbook

Recommended reading

AT201 Mind, Language and Human Nature

Four hours per week (three hours evening)
Prerequisite, one of AT101, AT105, AT107 or approved equivalent
Assessment is continuous

A critical examination of some of the major problem areas in philosophy chosen from:

(a) mind and body; sensations and brain processes; dualism and monism;
(b) free will, determinism and the causal principle;
(c) phenomenalism;
(d) language, thought and knowledge; meaning and truth;
(e) historical development of attempts to formalise logical systems.

Preliminary reading

Textbooks
Please consult with lecturer before buying textbooks.

Recommended reading

AT203 Social and Political Philosophy

Four hours per week (three hours evening)
Prerequisite, one of AT101, AT105, AT107 or approved equivalent
Assessment is continuous

An examination of some of the traditional theories of the state or of political and social organisation. An analysis and evaluation of assumptions underlying moral and naturalistic theories of the state; an examination of notions of freedom, justice, equality, and the application of theories to current social/political problems; the legitimate use of authority; consent; obligation; the common good; social contract theories. Some of the more important writers to be considered are: Plato, Aristotle, Locke, Mill, Aquinas, Hobbes, Montesquieu, Rousseau, Dewey and Marx.

Preliminary reading

Textbooks
Please consult with lecturer before buying textbooks

Recommended reading
Murray, A.R.M. An Introduction to Political Philosophy. Lond., Cohen & West, 1968

AT205 Technology and Society

Four hours per week (three hours evening)
Prerequisite, one of AT101, AT105, AT107 or approved equivalent
Assessment is continuous

The interaction between technology and social change: ancient societies, Greece, Rome, modern Europe, England, America, Australia. Politics, economics, religion, values, traditions, social structures, education, relations with neighbours, knowledge and skills, are factors which combine to influence the course of technological development. Also considered are
the moral dilemmas of the modern technologist and problems of pollution and environment control.

**Preliminary reading**


**Textbook**


**Recommended reading**


Lilley, S. *Men, Machines and History*. 2nd edn, Lond., Lawrence & Wishart, 1965


**AT207 Man's Place in Nature**

Four hours per week (three hours evening)

Prerequisite, one of AT101, AT105, AT107 or an approved equivalent

Assessment is continuous

An examination of the aims, concepts and methods of the emerging ‘science of man’ of the nineteenth and early twentieth centuries; social and intellectual factors in the origins of psychology; ‘man’s place in nature’; the concept of race in nineteenth century thought; Sigmund Freud, his life and times. Important issues in philosophy raised by the social sciences, e.g. causation, determinism, free will, and moral responsibility, are dealt with within the historical context in which they arose.

**Textbooks**


Freud, S. *Two Short Accounts of Psychoanalysis*. Harmondsworth, Penguin, 1972

**Recommended reading**


**AT301 Aesthetics, Education and Reason — diploma**

Five hours per week (combined day and evening)

Prerequisites, AT101 and two of AT201, AT203, AT205, AT207 or an approved equivalent

Assessment is continuous

Emphasis in this subject is on the changes in approach resulting from the influence of Wittgenstein and the methodology of linguistic analysis. The role of theory is examined, and the movement from a traditional theory of knowledge to a theory of meaning. Concentration is upon two related areas:

(a) linguistic analysis and the justification of educational objectives; intrinsic and extrinsic values; moral obligation; an analysis of the concepts of ‘growth’, ‘autonomy’, ‘mental health’ and ‘rationality’;

(b) the problems of definitions, interpretation and evaluation of works of art, emotions and feelings; uniqueness of works of art; the problem of standards or criteria in evaluation; the problem of meaning and the author’s intention; the education of emotions.

**Textbooks**

Please consult with lecturer before buying textbooks.

**Recommended reading**


Peters, R.S. *Ethics and Education*. Lond., Allen and Unwin, 1970

Stevenson, C.L. *Ethics and Language*. Yale, Yale University Press, 1944


**AT302 Aesthetics, Education and Reason — degree**

Two hours per week (combined day and evening)

Prerequisites, AT101 and two of AT201 or AT203 or AT205 or AT207 or an approved equivalent

Assessment is continuous

A series of seminars on some of the following topics: rationality and the nature of reason; reasoning and values; relativism; assessments of and decisions about theories.

**Textbooks**

Please consult with lecturer before buying textbooks.

**Recommended reading**


**AT304 Science and Change — diploma**

Five hours per week

Prerequisites, AT205 and one of AT201, AT203, AT207 or an approved equivalent

Assessment is continuous

In this subject the problems faced by those who sought to understand the nature of matter are examined. The first section is set against the background of the upheaval in scientific knowledge which characterised the seventeenth and early eighteenth centuries. The second section is devoted to a study of the scientific biographies of twentieth century men and women who first worked in the field of atomic physics in order to investigate the relation of the pure science study of matter theory to its applied science derivatives in medicine and warfare.

**Textbooks**


Leicester, H.M. *The Historical Background of Chemistry*. N.Y., Dover, 1971


**Recommended reading**

AT305  **Science and Change — degree**

Two hours per week

Prerequisites, AT205 and one of AT201, AT203, AT207 or an approved equivalent

Assessment is continuous

A series of seminars devoted to a special study of Sir Isaac Newton and Albert Einstein.

*Textbooks*

Clark, R.W. *Einstein, the Life and Times*. Lond., Hodder and Stoughton, 1973

Ridley, B.K. *Time, Space and Things*. Lond., Peregrine, 1976


AT306  **Philosophy of Science — diploma**

Five hours per week

Prerequisites, two of AT201, AT203, AT205, AT207 or an approved equivalent

Assessment is continuous

An introduction to some of the central topics in current and classical philosophy of science. Topics are selected from (a) the constraints placed by social factors on scientific research, (b) laws, theories and explanation, (c) induction and probability, (d) dimensions, space and time, (e) causality, (f) paradigms and conceptual schemes.

*Preliminary reading*

Theobald, D. *An Introduction to Philosophy of Science*. Lond., Methuen University Press, 1968

Toulmin, S. *Philosophy of Science*. Lond., Hutchinson, 1953

*Textbooks*

Please consult with lecturer before buying textbooks

*Recommended reading*


Kuhn, T. *The Structure of Scientific Revolutions*. 2nd edn, Chicago, University of Chicago Press, 1970

Losee, J. *An Historical Introduction to Philosophy & Science*. Lond., Oxford University Press, 1972


AT307  **Philosophy of Science — degree**

Two hours per week

Prerequisites, two of AT201, AT203, AT205, AT207 or an approved equivalent

Assessment is continuous

A series of seminars devoted to a study of the approach to philosophy of science known as instrumentalism. Some of the topics discussed are: the notion of a ‘family concept’ in philosophy; the philosophical and historical bases of instrumentalism; the American pragmatist; Dewey’s role in the development of instrumentalism; criticisms of the instrumentalist mode of thought; the realist view.

*Preliminary reading*


*Textbook*

Kannegiesser, H. *Knowledge and Science*. Melb., Macmillan, 1977

*Recommended reading*


Faculty of Arts

Literature/media studies

Separate majors are offered in each of these subject areas; however a stage one semester subject AT134 Contemporary Writing and Production, is offered jointly. This subject is an alternative to AT122 Nineteenth Century Literature and AT132 Forms of Communication, and is recognised as a prerequisite to stage two in each of these subject areas. It should be noted that AT134 counts as one stage one subject in either literature or media studies, but not both. Students may not enrol for all three of AT122, AT132 and AT134 subjects.

Literature subject details

AT120 Twentieth Century Literature
Four hours per week (three hours evening)
One or two lectures; two or three tutorials
Prerequisite, nil
Assessment is by assignments and examination

This subject introduces students to a selection of twentieth century literature, relating it to recent developments in the other arts and in society. Students are also introduced to some of the varied possibilities inherent in the novel, drama and poetry as literary forms.

Preliminary reading
Dawson, S.W., Drama and the Dramatic. Lond., Methuen, 1970

AT122 Nineteenth Century Literature
Four hours per week (three hours evening)
One or two lectures; two or three tutorials
Prerequisite, nil
Assessment is by assignments and examination

This subject surveys Romantic and post-Romantic writers of the nineteenth and early twentieth century, emphasising the artist’s awareness of, and increasing divorcement from social concerns. Both English and European fiction and drama, and English poetry are studied in the course.

Preliminary reading
As for AT120

Alternative course in literature/media studies

AT134 Contemporary Writing and Production
It should be noted that this counts as one stage one subject in either literature or media studies, but not both. It is expected that restrictions will have to be placed on entrance autotas.
Four hours per week
Prerequisite, nil
Assessment is continuous

This subject is offered in second semester in the daytime only. It provides an examination of contemporary and avant-garde writing and production, in conventional and experimental forms, presenting an overview of four areas of creative activity: the contemporary poem; short prose fiction; film and drama. Participants should want to explore their own creative potential in these forms, and an important part of their work will be the opportunity to make and evaluate these explorations. In addition to production work relating to these four main areas, activities may include poetry and play readings, visits by practising writers, examinations of works from rough draft to finished product, visits to theatres, both front and backstage, and rehearsals; tapes of readings and interviews with overseas writers, workshop and discussion sessions on writings produced by the group.

Textbooks
Detailed reading lists will be available at the end of first semester.

AT220 Elizabethan and Jacobean Literature
Four hours per week (three hours evening)
One lecture, three tutorials
Prerequisite, AT120, AT122 or approved equivalent
Assessment is by assignments and examination

A number of Shakespearean plays are studied intensively. There are background lectures on Elizabethan society and the theatre, and the study of some selected works of other dramatists and poets of the age.

Preliminary reading

AT222 Seventeenth and Eighteenth Century Literature
Four hours per week (three hours evening)
One lecture, three tutorials
Prerequisite, AT120, AT122 or approved equivalent
Assessment is by assignments and examination

The relationship between literature and society in seventeenth and early eighteenth century England with particular emphasis on the shorter poems of Milton; Restoration drama; the social values that are expressed by the Augustans; the satirists, especially Swift and Pope, as critics of their society.

Preliminary reading

AT320 Literature of the United States diploma
Five hours per week
Two seminars: one of two hours, one of three hours
Prerequisites: AT220, AT222 or approved equivalent
Assessment is continuous

An intensive study of representative works of the nineteenth and twentieth century, their relation to social movements and the current of ideas, and to modern European literature.
Authors selected include Stevens, Eliot, Pound and Lowell; the mainstream of novelists from Hawthorne to Bellow; and dramatists of the twentieth century.

**Preliminary reading**


**AT321 Literature of the United States — degree**

One two-hour seminar per week
Prerequisites, AT220, AT222
Assessment is continuous

**Preliminary reading**

As for AT320

**AT322 Australian Literature — diploma**

Five hours per week
Two seminars: one of two hours, one of three hours
Prerequisites, AT220, AT222 or approved equivalent
Assessment is continuous

Students are encouraged to read widely in nineteenth and twentieth century Australian literature, to associate the creative works with the general cultural environment, observing both those elements which may be claimed to be distinctively Australian and those deriving from English and European sources. Poetry studied ranges from the ballads to contemporary verse; narrative fiction is studied from Lawson to the present; the drama is chosen mostly from the period after 1950.

**Preliminary reading**


**AT323 Australian Literature — degree**

One two-hour seminar per week
Prerequisites, AT220, AT222
Assessment is continuous

**Preliminary reading**

As for AT322

**Media studies subject details**

**AT132 Forms of Communication**

Four hours per week (three hours evening)
Prerequisite, nil
Assessment is continuous

In this subject a variety of visual and sound works are examined in terms of their socio-historical significance, and their formal capacities and limitations are highlighted. In addition, students are required to attend a series of workshop sessions on interviewing techniques. Attention is also paid to the ways in which students can improve their own oral and written communication skills.

Topics to be considered are: film as a social artefact; ideology and documentary form; photography; the social function of art; the process of adaptation; elements of contemporary music.

**Textbooks**

No prescribed texts.
Detailed reading lists are distributed at the introductory sessions.

**Alternative course in literature/media studies**

**AT134 Contemporary Writing and Production**

It should be noted that this counts as one stage one subject in either literature or media studies, but not both. It is expected that restrictions will have to be placed on entrance quotas

Four hours per week
Prerequisite, nil
Assessment is continuous

This subject is offered in second semester in the daytime only. It provides an examination of contemporary and avant-garde writing and production, in conventional and experimental forms, presenting an overview of four areas of creative activity: the contemporary poem; short prose fiction; film and drama. Participants should want to explore their own creative potential in these forms, and an important part of their work will be the opportunity to make and evaluate these explorations. In addition to production work relating to these four main areas, activities may include poetry and play readings, visits by practising writers, examinations of works from rough draft to finished product, visits to theatres, both front and backstage, and rehearsals; tapes of readings and interviews with overseas writers, workshop and discussion sessions on writings produced by the group.

**Textbooks**

No prescribed texts.
Detailed reading lists will be available at the end of the first semester

**AT230 Print Media**

Four hours per week (three hours evening)
Prerequisite, any stage one media studies subject
Assessment is continuous

This is an introductory subject in print media, examining aspects of the press, journalism and book publishing. There is an analysis of the readership and editorial policies of Australian press, tabloids and magazines. Case studies of journalism include an analysis of the work situation of Australian journalists, press radicalism, alternative presses, and forms of journalese such as political speech writing, issue of
columns, investigative or expose reporting. Wide opportunities are provided for original writing — general and specialist press articles, including news reports, feature articles, daily columns or fiction, such as short stories for magazines. Individual criticism of writing style and techniques are discussed in workshop sessions.

**Preliminary reading**


**Recommended reading**


**AT232 Mass Media**

Four hours per week (three hours evening)

Prerequisite, any *stage one* media studies subject Assessment is continuous

This subject is designed to demystify the nature and processes of mass communication in its major forms, and its inter-relationship with society. There is continuing examination of the political, social and ethical issues concerning media, particularly electronic media — television, radio and film. The power and influence of mass media are examined. The emphasis is on the study of media in Australia, though relevant overseas findings are considered. Students may undertake original investigations into those media issues which interest them particularly.

**Preliminary reading**


**Recommended reading**

Barr, T. *Reflections of Reality, Media in Australia*. Melb., Rigby, 1977


McQueen, H. *Australia's Media Monopolies*. Melb., Widescope, 1977

**AT330 Writing for Radio and Television — diploma**

Five hours per week

Prerequisites, AT130 or AT132 or AT134 and AT230 and AT232. AT330 should either precede, or be taken concurrently with, AT331. Assessment is continuous

This subject involves the critical analysis of individual works written for radio and television. These are then examined in the light of evolving an overall aesthetic of the medium concerned. Attention is directed towards devising a satisfactory means by which works in both media may be analysed structurally. In addition, instruction is given in basic radio-play scriptwriting and production.

**Preliminary reading**

Dwyer, T. *Composing with Tape Recorders: Music and Concrete for Beginners*. Lond., Oxford University Press, 1972


**Textbooks**

For radio: Haworth, D. *Events at the Salamanter Hotel*. (Tape only)

Haworth, D. *We All Come to it in the End*. Lond., BBC, 1972

**AT331 Writing for Radio and Television — degree**

Two hours per week

Prerequisites, as for AT330

AT331 should either be preceded by, or taken concurrently with, AT330

Assessment is continuous

Degree students are required to attend a series of discussion groups in order to construct a theory of radio-play or television-play aesthetics.

Works and issues to be covered are: (1) Luciano Berio’s *Visage* and A-Ronnn; vocal elements in sound-play; (2) Kriwet’s *Voice of America* (*Hortext VII*) and Campaign (*Hortext IX*): silence in radio; FX and radio as radio; (3) Becker’s *House and Home*, Ernri Jandl’s *Fünf Mann Menschen* and *The Emigrants*: cliché and narrative elements in soundplay; (4) Mauricio Kagel’s *Soundtrack*: sound-play and environment; (5) John A. Scott and Robert M. *Now is the Time, if ever there was a time, for the People of Australia to Rise in Anger and Start to Intervene in the Affairs of Governing this Country* (1977), *Eleven, Eleven* (1979) and *77m*, North, 63 East (1979): montage and documentary elements in radio-play; (6) Television-play and realism; (7) Television-play and the absurd; (8) Television-play: documentary form and cinemaverite; (9) Television-play and video. The experimental video work of Tambellini, Cantrill and Bartlett.

**References**

(a) General works on radio-play and radio drama theory

Arnheim, R. *Radio*. Lond., Faber & Faber, 1936


Cory, M. *The Emergence of an Acoustical Art Form: An Analysis of the German Experimental Horspiel of the 1960's.*
textbooks

AT332 Communication and Human Behaviour — diploma
Five hours per week
Prerequisites, as for AT330
Assessment is continuous
This subject develops the study of human communication theory in greater depth and examines the social and psychological aspects of communication. It includes the following topics: intra-personal, interpersonal, small group and mass communication; communication and its relationship to beliefs, attitudes and behaviours; communication systems and their relationship to social, political and economic factors; and communication and organisations.

Recommended reading
Crosbie, P.V. Interaction in Small Groups. N.Y., Macmillan, 1975
Goldhaber, G.M. Organizational Communication. Dubuque, Brown, 1974

Shaw, M.E. Group Dynamics. N.Y., McGraw-Hill, 1976

AT333 Communication and Human Behaviour — degree
Two hours per week
Prerequisites, as for AT332
Assessment is continuous
These subject details are the same as for AT332. Students select specific topics relevant to the course for study in depth.

Recommended reading
As for AT332
Languages

Diploma subjects offered

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Degree subjects offered

All stage one and two subjects, as listed above. The following stage three subjects:

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<tr>
<td>AT313</td>
<td>Japanese 3</td>
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Italian

This course is designed to acquaint students with the Italian language, the native tongue of Australia's largest migrant group. The aim is therefore to provide the student with the means whereby communication with Italians is possible, both linguistic and socio-cultural.

Italian subject details

AT110  Italian 1
Eight hours per week (six hours evening)
Prerequisite, nil
Assessment is partly continuous, partly by examination

This is a practical introduction to the language. The systematic and progressive study methods are based on language laboratory facilities. A general introduction to the study of Italian civilisation and the Italian way of life is given as well as lectures on Italian history. Students with proven ability in Italian may be required to undertake special studies in addition to prescribed course work.

References
Elia, P. Il verbo italiano ad uso degli stranieri. 12th edn, Verona, Edizioni Scolastiche Mondadori, 1971

AT210  Italian 2
Eight hours per week (six hours evening)
Prerequisite, AT110 or approved equivalent
Assessment is continuous

Emphasis is on the development of practical skill in the use of the language, and language laboratory facilities are provided. Literary studies are undertaken, aimed at broadening practical knowledge of the language, and inculcating an interest and understanding of social, political and cultural aspects of modern Italy. A study of Italian linguistic history is undertaken also.

Japanese

With the deepening of relations between Australia and Japan on many levels, it is desirable that a study of Japanese language, both spoken and written, is undertaken by a greater number of Australians. It is important that knowledge and understanding of Japan is increased in Australia. This course trains students to communicate effectively in Japanese and it also provides the opportunity to study Japanese culture and society through the language.

Japanese 1, 2 and 3 form a major sequence in the language.

Students undertaking a major in Japanese are highly recommended to enrol in AT114 Communication in Japanese A and AT115 Communication in Japanese B also, as these provide an essential background to Japanese language and culture. AT247 Modern Japan, offered by the Social and Political Studies Department, is also highly recommended.

Students intending to major in Japanese should enrol in the first instance in AT112 Japanese 1.

Japanese subject details

AT112  Japanese 1
Eight hours per week (six hours evening)
Prerequisite, nil
Assessment is continuous

This is a subject designed to introduce students to the Japanese language, and training is provided in language patterns and grammar, writing, conversation, listening and comprehension. Films, slides and a variety of taped materials are used extensively throughout the course. As a further aid, taped cassettes of each lesson are available on loan.

It is highly recommended that students enrolled in this subject enrol in AT115 Communication in Japanese B also, during second semester.

Textbook
AT114 Communication in Japanese A
Four hours per week
Prerequisite, nil
Assessment is continuous
The subject comprises two segments:
(1) introduces historical and cultural topics of direct relevance to the development of Japanese language and society.
(2) training in simple Japanese conversation.

AT115 Communication in Japanese B
Four hours per week
Prerequisite, nil
Assessment is continuous
The subject comprises two segments:
(1) introduces further topics relevant to language and effective communication. It aims at acquainting students with the differences between English and Japanese communication patterns. References in English are used.
(2) individualised tuition in simple Japanese conversation.

AT212 Japanese 2
Eight hours per week (six hours evening)
Prerequisite, AT112 or approved equivalent
Assessment is continuous
This subject extends the range of language patterns, grammar and writing. It also provides further training in oral and aural Japanese. Students are introduced to various topics on Japanese culture and society through reading in Japanese. A variety of listening materials and films is used throughout the course.
Japanese 2 includes a segment, ‘Field Studies’. Students systematically study a number of topics related to language and effective communication and collect data from Japanese people with whom they have regular contact. Each student is introduced to a native of Japan. This provides the student with the opportunity to converse in Japanese and to become familiar with Japanese attitudes and customs.
It is highly recommended that students enrolled in this subject enrol in AT114 Communication in Japanese A also, during the first semester.

Textbooks
Mizutani, O. and N. Nihongo Notes. Vols. 1 and 2

AT313 Japanese 3 — degree
Two hours per week
Prerequisite, AT212
Assessment is continuous
This subject consists of a two-hour class which deals with a number of issues on contemporary Japan, in Japanese. Students read a variety of unabridged newspaper articles which are complemented by additional language exercises.

Textbooks
As for AT312

For one year, as an alternative to the Swinburne course, students may choose to study at an approved language institution in Japan and be examined upon return.

Textbooks
Integrated Spoken Japanese I. Vols I and II, Tokyo, Inter-university Centre for Japanese Language Studies, 1971

References
Psychology

Diploma subjects offered

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Stage 1

Stage 2

Stage 3

In both diploma and degree studies at stage three students are expected to take either AT350 or AT352 in one semester and make up the necessary pair to complete a major strand by taking either AT353 or AT355 in another semester.

To complete the degree major in psychology, degree students must also take AT351 and AT354. Commencing in 1981 it may be possible for selected students to take a double major in psychology within their course for the degree of Bachelor of Arts. Students wishing to take this option must apply to the Psychology Secretary in the first semester of the second year of their course. The double major includes AT150, AT151, AT250, AT251, SM278, SM279 and all six of the stage three subjects in psychology which are listed above.

Psychology

The three-year course provides students with a broad introduction to psychology in the first two years and, for those majoring in psychology, the third year places emphasis on vocational skills and knowledge relevant to applied fields.

The first-year course in psychology combines subjects previously offered as Psychology I and Introduction to Design and Measurement. Students intending to major in the subject are required to take AT150 Psychology 1A and AT151 Psychology 1B. Each of these subjects comprises lectures, practical work and statistics.

In the second year, in addition to AT251 Psychology 2A and AT250 Psychology 2B, it is highly recommended that SM278 Design and Measurement 2A be taken by those wishing to major in psychology. SM279 Design and Measurement 2B may also be taken by those students with special interests or aptitudes in psychological research or who intend to complete postgraduate studies in psychology.

In the third year, subjects are offered in organisational and applied social psychology, together with the psychology of personality and personality adjustment. In addition, core studies in methodological analysis, introduction to psychometrics, and interviewing and counselling are offered to students taking degree studies.

Many people take up a career related to psychology after completion of a three-year program, but some choose to work as psychologists. In order to be regarded as a professionally-trained psychologist in Australia it is becoming increasingly necessary to be eligible for membership of the Australian Psychological Society (APS). The minimum academic requirement for associate membership of the APS is completion of an approved four-year program of psychological study. The Swinburne Bachelor of Arts psychology major has APS approval as a sequence of three years’ study and, to become eligible for associate membership in the APS, graduates must then complete an approved fourth-year course. (A list of approved courses is published in each volume of the Australian Psychologist.) The Swinburne Graduate Diploma in Applied Social Psychology has received accreditation as an approved fourth-year course.

Psychology subject details

AT150 Psychology 1A

Five hours per week daytime
Three and a half hours per week evening

AT150 and AT151 are designed to provide students with an introduction to the content and method of psychology. Topics covered in this subject include the origins of modern psychology, the biological bases of behaviour, the development of behaviour, perception and cognition, experimental design and analysis.

Preliminary reading

(Students are required to read this paperback before classes commence.)


AT151 Psychology 1B

Five hours per week daytime
Three and a half hours per week evening

Prerequisite, AT150

Topics covered in this subject include the psychology of learning, personality, problems in living, human abilities, and social applications of psychology. The design and analysis of experimental studies again forms a major part of the teaching program.

AT 250 Psychology 2B

Five hours per week daytime
Three and a half hours per week evening

Prerequisites, AT150 and AT151

It is highly recommended that SM278 Design and Measurement 2A be taken by students wishing to major in psychology. SM279 Design and Measurement 2B may also be taken by those students with special interests or aptitudes in psychological research or who intend to complete postgraduate studies in psychology.

This is a subject in developmental psychology, which emphasises the earlier periods of life at times when the
behaviour of infants and children is undergoing rapid development and maturation.

Emphasis is placed on social, emotional, cognitive and intellectual development with a comprehensive experiential and experimental program supporting the theoretical material. Students are encouraged and expected to interact with children of various ages.

The teaching program consists of two lectures, a practical session and a tutorial class.

Preliminary reading
Tucker, N. What is a Child? Glasgow, Fontana, 1977

AT251 Psychology 2A
Five hours per week daytime
Three and a half hours per week evening
Prerequisites, AT150 and AT151

This subject is about the scientific study of the personal and situational factors that affect individual social behaviour. The aim is to introduce students to the key conceptual and theoretical models in social psychology and to develop scientific and personal skills.

The teaching program involves two lectures per week plus a tutorial and practical session.

Preliminary reading

SM278 Design and Measurement 2A
Five hours per week daytime
Three and a half hours per week evening
Prerequisites, AT150 and AT151
Assessment is continuous

A second-year, first-semster subject in research design and statistical analysis. This course emphasises the relationship of experimental design to the analysis of results. The course provides students with a basic knowledge of the SPSS package so that statistical information can be obtained in order to analyse sample data. It also studies different research designs which may be encountered in their psychological studies. The subject is structured to provide the necessary statistical knowledge for students to be able to interpret computer printouts so that meaningful analysis can take place. Topics include: analysis of variance for one and two factor experiments, correlation coefficients and associated tests of significance with application to test analysis and regression analysis. All large scale computation is solved on the various computer packages within the institute.

Text
SPSS Manual

References
Specific references will be given during the semester

SM279 Design and Measurement 2B
Five hours per week, daytime
Three and a half hours per week, evening
Prerequisite, SM278 Design and Measurement 2A
Assessment is continuous

A second-year, second-semster subject in research design and statistical analysis. The subject reviews and extends the topics studied in Design and Measurement 2A to the areas of:

(a) curvilinear trend analysis;
(b) analysis of covariance;
(c) factor analysis.

The principal method of computation is the SPSS package. The subject emphasises the understanding of statistical concepts and their application to the analysis and interpretation of data in psychological research.

References

AT350 Psychology 3A — diploma
(organisational psychology)
Four hours per week
Prerequisites, AT250 and AT251

Working on the premise of open systems theory, this subject concentrates on ways of explaining and understanding the behaviour of people who are part of an organisation.

Important dimensions of behaviour in organisations are examined to provide perspective for studying the psychological well-being of individuals within a variety of organisational settings.

Inter and intra-personal influences: motivational, perceptual, communicational, interpersonal relationships, leadership and authority.

Consequences: vocational choice, entry and maintenance; industrial relations and well-being.

Laboratory sessions are devoted to the processes and procedures that allow effective assessment of behaviour in particular organisational contexts.

Recommended reading

AT351 Psychology 3A/B — degree
(Methods and Measures)
Three hours per week
Prerequisites, AT250 and AT251
Assessment is based on submissions from laboratory exercises.

This subject is divided into two parts. The first part emphasises the critical evaluation of psychological research as reported in the literature. The second part is concerned with the construction, development and application of various types of psychological tests and scales.

Recommended reading

AT352 Psychology 3B — diploma
(Psychology of personality)
Four hours per week
Prerequisites, AT250 and AT251

This subject introduces students to the major contemporary theories and concepts relating to personality and personality assessment.

After a review of major historical developments in the field (e.g. the ‘grand theories’ of Freud, Dollard and Miller, Rogers, Maslow and Erikson), contemporary developments are...
examined. This examination focuses on the distinction between 'trait' theories such as those of Eysenck, and 'purposive-cognitive' theories such as those of Mischel, Bandura, Harre, Shotter, Bannister and Argyle.

In the final part of the program personality research and assessment methods are considered.

Students are expected to familiarise themselves with major historical theories through preliminary reading. An overview of these influential theories will be given in early lectures but the emphasis will be on how current conceptual models and strategies can be employed in understanding persons.

Preliminary reading

AT353 Psychology 3C — diploma
(Psychology of adjustment)
Four hours per week
Prerequisites, AT250 and AT251

This subject examines the concept of 'adjustment', 'stress' and 'coping' behaviour and related theoretical, social and ethical issues. Some critical periods of human life are selected for study; periods which require major changes in coping behaviour. Included are: changes and adjustments in childhood, adolescence and maturity. More specifically the subject is about:

(a) the concepts of adjustment and maladjustment, normality and abnormality, coping and adaptation — cultural relativism — ethical and moral issues pertaining to these concepts;
(b) theoretical views of 'stress' and 'coping' process — the need to consider the individual in interaction with the environment;
(c) coping in childhood, adolescence and maturity — specific 'coping' problems and developmental crisis points;
(d) conflict, frustration, aggression and anxiety;
(e) towards behavioural change — different approaches

Preliminary reading
Lazarus, R.S. Patterns of Adjustment. N.Y., McGraw-Hill, 1976

AT354 Psychology 3C/D — degree
(Interviewing and counselling)
Three hours per week
Prerequisites, AT250 and AT251
Assessment is based on project work

This subject is an introduction to the theory and practice of interviewing and counselling. Topics covered are selected from counselling, employee selection, group interviewing, and interviewing for assessment.

Preliminary reading

AT355 Psychology 3D — diploma
(Applied social psychology)
Four hours per week
Prerequisites, AT250 and AT251

This subject is related to issues of current interest and real life relevance to which social psychologists are being asked to contribute. The emphasis is on stressing the use and relevance of social psychological methods and explanations in the study of social issues.

Students complete a project within a general topic area, such as the influence of environment on individual behaviour.

Several weeks are set aside for experimental work, to allow students to become familiar with some of the investigatory techniques used by social scientists. Following this experimental stage, students are encouraged to consider theoretical issues relating to the methods used, including ethical considerations.

Preliminary reading
Social and political studies

Diploma subjects offered

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Stage one
- AT146 Foundations of the Third World
- AT147 Modern Southeast Asia
- AT170 Sociology 1A
- AT171 Sociology 1B

Stage two
- AT240 Advanced Australian Politics
- AT241 Political Sociology
- AT245 Socialism and Development in China
- AT246 The Chinese Revolution
- AT247 Modern Japan
- AT270 Sociology 2A
- AT271 Sociology 2B
- AT272 Sociology 2C
- AT273 Sociology 2D

Stage three
- AT340 Public Policy in Australia
- AT342 Comparative Politics — The Soviet Union
- AT344 Comparative Politics — China
- AT346 Colonialism, Class and Underdevelopment — India
- AT370 Sociology 3A
- AT372 Sociology 3B
- AT374 Sociology 3C

Degree subjects offered

All stage one and two subjects, as listed above.
The following stage three subjects:

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Political studies

Political studies is an approved vocational major. The subject area combines those subjects previously offered in Asian studies, contemporary history and modern government. Political is used in a wide sense. The scope of political studies is not confined simply to the study of the organisation of government or political behaviour, it is also concerned with the broader issues of social science, such as class, ideology and the distribution of power. It is multi-disciplinary and combines perspectives from political science, history, economics, sociology and anthropology.
The only restrictions in political studies subjects are the individual subject prerequisites.

Students have several alternatives. They may enrol in:
- single semester subjects
  - in a sub-major
  - in a major
  - in a major and a sub-major
  - in two majors.

A major consists of at least one semester subject in stage one, two semester subjects in stage two, and two semester subjects in stage three.

A minor consists of at least one semester subject in stage one and two semester subjects in stage two.

Social and Political Studies subject details

AT140 Australian Politics
Four hours per week (three hours evening)
Prerequisite, nil
Assessment is by essays and/or examination
This subject is an introduction to the framework of Australian government and politics. The following topics are considered: voting behaviour, the electoral system, the constitution and its politics, parliament, cabinet and the public service, political parties, federalism, pressure groups; in particular business and labour. These topics are taught at a basic level which presumes no previous knowledge of Australian politics. However, towards the end of the course students are introduced to more complex themes of politics such as ideology, class, hegemony, control and democracy, and their bearing on Australian politics.

Preliminary reading
Forell, C.R. How We Are Governed. Melb., Cheshire, 1977
Jones, A. ABC of Politics. 3rd edn, Cassell Australia, 1978

AT141 Foundations of Modern Politics
Four hours per week (three hours evening)
Prerequisite, nil
Assessment is by classwork, essay and a test
An historical introduction to the major political movements that have shaped modern Europe and, through the expansion of European power, the whole modern world as well. It deals with liberalism, conservatism, democracy, socialism, communism and fascism. The emphasis is on placing the basic ideas in their historical context rather than on detailed analysis of concepts and theories. While students are expected to study a core of essential reading to gain an elementary knowledge of all these competing movements, the main concern of the course is to encourage and assist students to pursue areas of historical study that they find of particular interest.

Recommended reading
Weiss, J. Conservatism in Europe [1770-1945]. Lond., Thames and Hudson, 1977
AT142  Law and Society
Four hours per week (three hours evening)
Prerequisite, nil
This subject cannot be chosen as the basis for a major in political studies
Assessment is continuous
The subject examines basic formal aspects of the law as well as its relationship to social institutions and social classes. The aim is to strip laws and legal processes of their sense of mystery.
Recommended reading

AT145  Global Power and Under-development
Four hours per week (three hours evening)
Prerequisite, nil, but students would be assisted by taking AT146 concurrently with, or prior to enrolling for, this subject
Assessment is by essays and tutorial participation
This subject examines the orthodox western strategies for economic development and why they have failed to advance materially the welfare of the majority of the citizens of the Third World. Current international trade and aid mechanisms are viewed as fostering Third World dependency by the economically advanced industrialised countries. This framework is seen as facilitating the penetration of transnational corporations in the Third World countries and accentuating existing imbalances in the rural and urban economic structures. In conclusion, the course evaluates the adequacy of dependency theories and the various Marxist criticisms and ends by asking the question, is Australia also caught within this dependency relationship?
Preliminary reading

AT146  Foundations of the Third World
Four hours per week (three hours evening)
Prerequisite, nil
Assessment is by essays, and tutorial participation
Foundations of the Third World begins by looking at the obvious signs of underdevelopment in today's world. By examining the historical origins for this present division of the world into rich and poor, this subject reveals the structural reasons underlying the surface appearances. The focus is upon the pattern of economic control that spread backwards from Western Europe, changed into the direct political control of colonial empires and in the process set up an international division of labour, technology and wealth. The central issue is the emergence of relationships that operated as a worldwide system of appropriation which transferred values from peripheral countries to centre countries, from poor to rich, from powerless to powerful. In short, how countries became underdeveloped is an important part of why they remain underdeveloped.
Recommended reading

AT147  Modern South east Asia
Four hours per week (three hours evening)
Prerequisite, nil
Assessment by papers and/or examination
An examination of the nature, success and failure of selected nationalist and revolutionary movements in south east Asia as a background to a study of some of the features of the region since 1945. The latter include: communalm, authoritarian government, political violence, military participation in politics, students and political activity.

AT240  Advanced Australian Politics
Four hours per week (three hours evening)
Prerequisite, AT140 or HSC (Year 12) Politics or Australian History
Assessment is by class work and essay
An examination of the historical development of class relations and the structure of political power in Australia since the beginnings of white settlement. It deals with the convict system, the era of pastoral expansion and representative government, the rise of the working class and the party system, and the structure of power in contemporary industrial capitalist Australia.
Preliminary reading
Ward, E. Australias, Syd., Ure Smith, 1967
Textbook

AT241  Political Sociology
Four hours per week (three hours evening)
Prerequisite, any stage one political studies subject, or an approved equivalent (students may choose AT241 Political Sociology, or AT273 Sociology 2D, but not both)
Assessment is continuous
This subject examines the influence of society upon politics. Topics to be considered include the historical background to political sociology; classic views about the nature of human beings and society; an analysis of the concepts of power, authority and influence, with reference to Max Weber; the problem of locating power in modern society and an examination of three theories of power and society, namely Marxist, elitist and pluralist theories; the definition of democracy and the debate about its various models.
Preliminary reading
R.E. Dowse and J.A. Hughes, Political Sociology. Lond., John Wiley & Sons, 1972, ch. 1

AT245  Socialism and Development in China
Four hours per week (three hours evening)
Prerequisite, any stage one political studies subject
Assessment is continuous
After liberation in 1949, China began a program of centrally-planned, socialist, agricultural and industrial development. Today no one can deny the success of that program in materially raising the welfare of the Chinese people. The course examines the origins of the policies and the development of the strategies that have led to both self-generated economic growth and greater distributive justice in the People's Republic of China.
Recommended reading
**AT246  The Chinese Revolution**

Four hours per week (three hours evening)
Prerequisite, any stage one political studies subject, or an approved equivalent
Assessment by papers and tutorial participation

This subject is concerned with developing some understanding of contemporary Chinese society. The study combines the perspectives of history and politics. Peasant movements and the impact of western influence on the disintegration of China are taken into account. Special emphasis is placed on cultural, social and institutional change in China after 1949 with some examination of contemporary Chinese society.

Recommended reading

**AT247  Modern Japan**

Four hours per week (three hours evening)
Prerequisite, any stage one political studies subject, or an approved equivalent
Assessment by tutorial participation, papers and/or an examination

Discussion centres around the problems of Japanese nationalism reflected in the nature of Japan's modernisation, the consequences of her emergence as a world power, her defeat, and re-emergence as an economic power. An examination of the social configuration of Japanese society sheds light on the characteristic features which distinguish contemporary Japan from other industrialised societies, especially in politics, education, business operations and employer-employee relations.

Recommended reading

**AT340  Public Policy in Australia — diploma**

Five hours per week day and evening
Prerequisites, AT140 or equivalent, two stage two political studies subjects. AT240 is recommended.
Assessment is continuous

The diploma component of this subject is concerned with the organisation and functioning of the executive government and the administrative arm of government at the federal level. A central concern is with the limitations on effective decision- (and policy-) making within the context of a written federal constitution and the conventions of a Westminster system of responsible government.

While the approach borrows from public administration, the study of the administrative arm of government (the public service) is limited to illustrating its role in the decision- and policy-making process. Control and co-ordination of the public service is raised only within an examination of the budget process (the processes of financial control and resource allocation). This is followed by a brief look at the processes of economic policy formulation. The aim here is to illustrate that sound management of the economy is a prerequisite for the pursuance of other areas of government policy.

Textbook

**Recommended reading**
Forward, R. *Public Policy in Australia*. Melb., Cheshire, 1974
Patience, H. and Head, B. eds. *From Whitlam to Fraser: Reform and Reaction in Australian Politics*. Melb., Oxford University Press, 1979

**AT341  Public Policy in Australia — degree**

Two hours per week day and evening
Prerequisite, as for AT340
Students will be expected to deal with particular issues in depth and to participate in a series of seminars.
Assessment is continuous

**AT342  Comparative Politics: The Soviet Union — diploma**

Five hours per week day and evening
Prerequisites, two stage two political studies subjects
Assessment is continuous

The subject introduces students to the comparative analysis of political systems through a study of Soviet government and society. The central aim is to provide a framework for the comparative analysis of communist political systems but not to the exclusion of providing some points of comparison and contrasts with political systems of the Australian type.

The approach is within a general context of economic, political and cultural development, with a thematic link that explores the varying problems and issues encountered in the construction of socialism. The issues involved in the discussion over what is a socialist society, provide the bridging theme in the comparative analysis of the Soviet Union and China.

At the diploma level the following are the core topics basic to an understanding of communist political systems:
- state and party; political control and leadership; political recruitment;
- communist ideology; socialisation; political consciousness and participation;
- social and economic planning and management;
- social structure; class and class conflict; bureaucracy and elites.

Case studies provide depth in selected areas: the family, entertainment and leisure; crime and deviance; education; health and social welfare; city and rural life; minorities and ethnic groups; dissent and repression.

References
AT343 Comparative Politics: The Soviet Union — degree

Two hours per week day and evening
Prerequisite, as for AT342. Students will be expected to deal with particular issues in depth and to participate in a series of seminars.
Assessment is continuous.

AT344 Comparative Politics: China — diploma

Five hours per week day and evening
Prerequisites, two stage two political studies subjects
Assessment is continuous.

The subject introduces students to the comparative analysis of political systems through a study of Soviet government and society. The intention is to provide a framework for the comparative analysis of communist political systems but not to the exclusion of providing some points of comparison and contrasts with political systems of the Australian type.

The approach is within a general context of economic, political and cultural development, with a thematic link that explores the varying problems and issues encountered in the construction of socialism. The issues involved in the discussion over what is a socialist society provide the bridging theme in the comparative analysis of China and the Soviet Union.

The following are the core topics basic to an understanding of communist political systems:

- state and party; political control and leadership; political recruitment;
- communist ideology; socialisation; political consciousness and participation;
- social and economic planning and management;
- social structure; class and class conflict; bureaucracy and elites.

Case studies to provide depth in selected areas: the family, entertainment and leisure; crime and deviance; education; health and social welfare; city and rural life; minorities and ethnic groups; dissent and repression.

References


AT345 Comparative Politics: China — degree

Two hours per week day and evening
Prerequisite, as for AT344.
Students will be expected to deal with particular issues in greater depth and to participate in a series of seminars.
Assessment is continuous.

AT346 Colonialism, Class and Underdevelopment in India — diploma

Five hours per week day and evening
Prerequisites, two stage two political studies subjects, or an approved equivalent
Assessment is by seminar participation and papers

This subject takes up at an advanced level some of the central problems raised in the first year subjects AT145 and AT146 and sets them in the context of the various theories that attempt to explain them.

The first half of the program opens with a review of the conventional Western explanations of underdevelopment and then considers in turn the evolving theories of imperialism that have once more been gathering wider acceptance as an explanation of the reasons for underdevelopment.

India and the historical causes of underdevelopment are taken as a case study. The second half of the program centres on a famous debate in India as to whether agriculture there is becoming capitalist and the consequences of that development. In this section topics include the changing role of imperialist control in pre-colonial and post-colonial periods, together with its consequences for class formation, persisting poverty and non-progressive change in land reform, agricultural modernisation, and industrialisation, within the context of existing dominant class interest.

Recommended reading

Tyler, M. My Years in an Indian Prison. Harmondsworth, Penguin, 1977

AT347 Relations between Japan and Asia — degree

Two hours per week
Prerequisites, two stage two political studies subjects, or an approved equivalent
Assessment is by seminar participation and papers

A study of Japan's involvement in south-east Asia or east Asia since 1952. The relationships between Japan and south-east Asian countries are examined against a background of the problems raised in AT141 and AT145 and in comparison to those discussed in AT346. Discussion centres around the consequences of dependency and the degree of complementarity in those relationships.

An alternative course examines Japan's relationships with Taiwan, North Korea, South Korea, the People's Republic of China and the USSR. Students are expected to investigate Japan's relationship with one state and to contribute to discussions of the implications and consequences of Japan's policies in east Asia.
Sociology

The sociology course is designed to provide an understanding of the social world and how it changes. Many theories have been developed to further our understanding and there is now a great range of techniques available for studying social life.

During the course of a major in sociology, students are introduced to theories and techniques which help us to know more about social systems. In stage one sociology, basic concepts of sociology are explained by reference to the sociological analysis of contemporary Australian society. This is a full-year course composed of two semesters of study.

At stage two, students may choose two of the four sociology subjects available, and are strongly advised to take AT271 Sociology 2B (Methodology of Social Research) if they intend to pursue degree studies in sociology.

Not more than two stage two sociology subjects may be taken. Students may enrol in either AT273 Sociology 2D or AT241 Political Sociology but not both. It is possible to take AT241 as a political studies subject, in addition to two stage two sociology subjects.

At stage three, students completing a major must take AT370 Sociology 3A (urban sociology), offered in the first semester only; and may then choose either AT372 Sociology 3B (organisational sociology) or AT374 Sociology 3C (minorities), offered as alternatives in second semester. In addition, degree students attend a two-hour seminar per week throughout the year. In first semester, the AT371 seminar deals with issues in empirical inquiry in sociology. In semester two the AT373 and AT375 seminars focus on a variety of contemporary issues.

For those students intending to pursue a career in applied sociology the Graduate Diploma in Urban Sociology is offered.

Sociology subject details

**AT170 Sociology 1A**

(Individuals and social groups)

Four hours per week (three hours evening)

Prerequisites, nil, but note that AT170 and AT171 are normally taken in the one year

Assessment consists of essays, project or examination

This subject is concerned with the systematic study of society and its elements, stressing the relationships between individuals and the groups they make up. Topics covered include the ways people become members of different groups, take on social roles and learn accepted notions of behaviour, the institutions of culture, religion and families, and the processes of social differentiation and the underlying structure and rituals of everyday life.

Elementary methods of data analysis are taught but no statistical knowledge is assumed. Teaching is mainly by lectures and tutorials, and a range of films and videotapes are used.

**AT171 Sociology 1B**

(Issues in contemporary Australia)

Four hours per week (three hours evening)

Prerequisite, AT170 taken in the same year

Assessment will be determined at the commencement of the course in consultation with students

This subject is an introduction to sociological ways of thinking about contemporary society as a whole, and particularly about Australia. It emphasises the empirical study of various aspects of Australian society and its social problems, examined within the framework of several contemporary social theories. The subject centres about a selection of topics taken from the following: poverty, unemployment, class structure, race relations, industrial sociology, language and culture, socialisation, families and kinship, urbanisation and models of capitalist industrial societies.

Elementary methods of data analysis are taught but no statistical knowledge is assumed. There is an optional program of films and videotapes throughout the program.

**AT270 Sociology 2A**

(Social change)

Four hours per week (three hours evening)

Prerequisites, AT170 and AT171

Assessment consists of one essay, final prepared examination and tutorial contributions

This subject deals with the most basic issues in social explanation: What holds society together? What are the sources of power? What is the importance of the economy, religion, bureaucracy and government? What causes social change? The ideas of several of the major social theorists are studied (e.g. Marx, Weber, Durkheim, Parsons) with a view to providing the student with an understanding of the central themes in sociology and a grounding in the theoretical concepts which are especially useful to those wishing to pursue sociology at an advanced level.

These basic theoretical issues are also applied to the study of concrete subject areas, mainly to family patterns and mass consumption.

**References**


**AT271 Sociology 2B**

(Methodology of social research)

Four hours per week (three hours evening)

Prerequisites, AT170 and AT171

Assessment is continuous and determined at the start of the course

Students intending to apply for degree studies are encouraged to enrol for this subject which will be offered in second semester. In first semester students may choose one of Sociology 2A, or 2C, or 2D.

**Preliminary reading**


In this subject, the emphasis is not so much on particular methods of gathering data as on the interplay between theoretical orientations and methodology, i.e., the theory-research relationship. The aims of sociology and the development of different theoretical orientations are important to any consideration of research and methodology. Thus major theoretical schools in sociology are viewed within the context of their methodological emphases. The course also considers methodological questions relevant to research in other subjects taught within the Department of Social and Political Studies.

Within this framework the course consists of combinations of lectures, tutorials, practical workshops and collective and/or individual workshops. The level and form of assessment depends on student preference, teaching resources and organisation of the course.

The course has two emphases in teaching approaches:
(a) sociological research raises fundamental problems of the social context of research (aims, ethics, organisation), and the relation between research design and explanation;
(b) practical skills must be set in that context and acquired through use in workshop and research projects. Areas covered include techniques such as sample surveys, scaling, interviewing, content analysis, critical investigations, and quantitative and qualitative data analysis.

References
Hughes, J. A. Sociological Analysis: Methods of Discovery. Lond., Nelson 1976
Shipman, M.D. Limitations of Social Research. Lond., Longman, 1972

AT272 Sociology 2C
(Sociology of deviance)
Four hours per week (three hours evening)
Prerequisites, AT170 and AT171
Assessment is continuous

Contemporary definitions of deviance include both the kind of behaviour traditionally considered to constitute social problems (for example: crime, delinquency, alcoholism, mental illness, prostitution, and homosexuality), as well as other areas which are important but traditionally underemphasised by criminologists and sociologists. These include sexism, white-collar and corporate crime, government corruption and structural critiques of society and the legal system. The study of these latter areas raises questions about the nature of social order and the use of knowledge and power by decision-makers and social control agents in ways that reinforce the dominance of more powerful groups over the less powerful in society.

The course focuses on different theoretical perspectives on deviance and the consequent variations in the sorts of problems studied, the methodology adopted and the types of results obtained. Such changing definitions of deviance also reflect historical and political changes within sociology, particularly the relationship between sociological research and social policy. An attempt is made to locate these questions within the context of Australian as well as overseas studies.

References
Cohen, S. Folk Devils and Moral Panic. Harmondsworth, Penguin

AT273 Sociology 2D
(Political sociology)
Four hours per week (three hours evening)
Prerequisites, AT170 and AT171, or an approved equivalent

For description of this subject see AT241 Political Sociology

AT370 Sociology 3A — diploma
(Urban sociology)
Five hours per week day and evening
Prerequisites, two stage two sociology subjects
Assessment is continuous

This subject deals with the growth of urban industrial societies over the last century with particular attention devoted to Australian urbanisation and urbanism. The study shows how an understanding of urbanism and urban problems is ultimately dependent upon an adequate analysis of the role of cities in the broader development of the nation. Several theories of urban development are introduced in the context of contemporary urban issues such as the housing and energy crises, urban and regional planning, suburban sprawl, inner city redevelopment, social segregation and the emergence of urban action groups. The role of actors in the private sector in urban development is examined together with their relationship to the various agencies of the State as well as the State’s own important role in urban development.

References

AT371 Sociology 3A — degree
Two hours per week, first semester
Prerequisites, as for AT370

Degree work will involve a series of advanced seminars dealing with issues in the methodology of social science.

AT372 Sociology 3B — diploma
(Sociology of organisations)
Five hours per week day and evening
Prerequisites, two stage two sociology subjects
Assessment is continuous

This subject combines elements of the studies commonly referred to as ‘organisational theory’, ‘industrial sociology’ and ‘sociology of work’. It includes the study of the various ways that organisations have been identified and analysed and a consideration of the social contexts in which they operate. Organisational structures are controversial because they engage the interests of different social groups for a variety of reasons which are perceived by their proponents as rational or moral. Particular organisational forms are not merely more or less efficient for the achievement of goals, they have a political and

Faculty of Arts

Wilson, P. and Braithwaite, J. Two Faces of Deviance. St Lucia, Queensland University Press, 1978
Therefore problematic content and it is important that both
of these main themes are emphasised.

The major sections of the course are:

(a) major schools of organisation theory;
(b) bureaucracy and industrial society;
(c) the contemporary pressures for organisational change
including study of West Germany and Yugoslavia.

Textbooks
Fox, A. *Man Mismanagement*. Lond., Hutchinson, 1974

AT373  Sociology 3B — degree
Two hours per week, second semester
Prerequisites, as for AT372
Degree work will involve a series of advanced seminars dealing
with current issues in sociology.

AT374  Sociology 3C — diploma
(Minorities)
Five hours per week day and evening
Prerequisites, two major sociology subjects
Assessment is continuous

In this subject, minority groups are studied in the context of
the larger society. Three types of minority groups are
considered: racial minorities, cultural minorities and sexual
minorities. Special attention is given to a general theoretical
understanding of minority groups in diverse situations.
Australian society is also studied in relation to Aboriginals,
migrants and women.

Preliminary reading
Rex, J. *Race Relations in Sociological Theory*. Lond.,
Weidenfeld & Nicolson, 1970

References
Simpson, G.E. and Yinger, J.M. *Racial and Cultural
Boston, Allyn and Bacon, 1971

AT375  Sociology 3C — degree
Two hours per week, second semester
Prerequisites, as for AT374
Degree work will involve a series of seminars dealing with
current issues in sociology.

Subjects offered by other faculties

Listed below are subjects taught by departments in other
faculties which may be taken by students enrolled in an
Arts degree or diploma course. Any Arts student wishing
to take one or more of these subjects must have the
approval of both the Faculty of Arts and the teaching
department concerned as enrolment in the subject may
depend on the availability of places and/or on certain
prerequisites.

Course regulations specify that:
(a) students taking both majors within the Faculty may
take subjects taught outside the Faculty up to a
maximum unit value of six;
(b) students taking one approved major outside the
Faculty may take subjects taught outside the Faculty
up to a maximum unit value of ten.
(For the purposes of this regulation, the subjects SM278
and SM279, Design and Measurement 2A and 2B are
regarded as subjects within the Faculty of Arts.)

Faculty of Applied Science

The following Applied Science subjects are
available to Arts students

(SP151 and SP152 are multi-disciplinary subjects taken as
two single semester subjects, either together or separately.)

SP151  Science in Modern Society
Four hours per week during first semester
No prerequisite
Assessment by examination

and

SP152  Science in Modern Society
Four hours per week during second semester
No prerequisite
Assessment by examination

The object is to give students an appreciation of various
branches of science and the roles science and technology play
in modern society.
No formal training in science or mathematics is assumed. Each
semester, four units are selected and typical units are:
The atmospheric environment
Nuclear energy
Physics and music
Physics and sport
Light and colour
Astronomy
Science and medicine
Science and foods
Aspects of genetics
Human physiology
Important chemicals in modern society
Computers in society
Aspects of geology.
SM171 Mathematics
Five hours per week in first semester
Prerequisite, usually a pass in an HSC mathematics subject or its equivalent
Assessment is continuous
A first-year subject which provides a foundation for studies in the theory of numbers, mathematical analysis, geometry and probability theory.
Intending students are invited to discuss this subject with the relevant Department of Mathematics staff.

SM172 Mathematics
Five hours per week in second semester
Prerequisite, SM171
Assessment is continuous
A first-year subject which extends the foundation studies in SM171 to linear algebra, multivariate calculus, geometrical topology and probability distribution theory.

SM271 Mathematics
Five hours per week in first semester
Prerequisite, SM171, SM172 or a tertiary mathematics equivalent
Assessment is continuous
A second-year subject in advanced calculus and the fundamentals of abstract algebra.
Intending students are invited to discuss this subject with the relevant Department of Mathematics staff.

SM272 Mathematics
Five hours per week in second semester
Prerequisite, SM271
Assessment is continuous
A second-year subject involving the study of major branches in geometry and analysis. Topics to be studied are chosen from: Projective geometry, Euclidean geometry, co-ordinate geometry, Vector spaces, Hilbert spaces. Topology. Finite geometries.

SC171/SC172 Biology
See Applied Science Faculty handbook for details of these subjects.

SC276 Physiology
See Applied Science Faculty handbook for details of this subject.

Faculty of Business
Economics
Economics is offered as a degree or diploma major in the Arts course. Arts students intending to take an economics major must discuss their overall study program with a course adviser in the Faculty of Arts to ensure that their study plans will satisfy the requirements for a degree or diploma.
The Department of Economics offers a wide range of subjects/units which may be taken individually, as a minor strand over two years, or as a major strand over three years.

To complete Faculty of Arts requirements for a degree major in economics the following subjects/units must be taken:

Stage 1 BS111
Stage 2 BS211 and BS213 or one of these plus any other selected from the remaining semester subjects listed below.
Stage 3 Three additional semester subjects from the list below.

For an Arts student taking a degree the completed economics major has a unit value of eight. BS111 is a full-year subject with a unit value of two but most semester subjects taught by the Business Faculty have a unit value of one. However, the three semester subjects taken by an Arts degree student at stage three level are credited together as having a unit value of four towards the Arts degree total unit value of twenty-four.

Arts students taking a diploma may also complete an economics major as part of their course. They are required to take the same subjects/units in stages one and two as degree students but in stage three only two additional semester subjects need to be taken. Thus the completed economics major for an Arts diploma student has a unit value of seven.

It is important to note that BS111 is a prerequisite for all other economics units offered by the Business Faculty and that every Arts student taking an economics major must also complete either BS211 or BS213.

Economics subjects offered
BS111 Economics 1
In this subject, some of the methods adopted by economists are used, to analyse economic problems within the framework of the Australian economic system. The course commences by examining the role of the contemporary market system in allocating resources and distributing income and wealth. This is followed by a detailed analysis of the determinants of the level and rate of change of output, employment, prices and international reserves. Attention is then focused on the role of fiscal, monetary, prices and incomes, and balance of payments policies in achieving, simultaneously, internal and external balance.

References
Shapiro, E. Macroeconomic Analysis. 4th edn. N.Y., Harcourt, Brace and Jovanovich, 1978

BS211 Managerial Economic Analysis
Prerequisite, BS111 Economics 1
Students who are contemplating major studies in economics should include this unit and/or BS213 Industry and Government in their courses.
This unit shows how economic analysis can be used to assist decision-making. Empirical studies will be used as a means of illustration. The unit deals with the following topics: demand analysis (demand theory, empirical demand studies including forecasting); production and cost analysis (opportunity cost, short-run and long-run production and cost curves); profit, and goals of firms; pricing policies of firms and public utilities.
BS213 Industry and Government
Prerequisite, BS111 Economics I
Students who are contemplating major studies in economics should include this unit and/or BS211 Managerial Economic Analysis in their course.

It deals with the structure, conduct and performance of industry in contemporary economies with special reference to Australia and considers the role of government in these economies.

A study of an Australian industry is an integral part of the course.

Monopoly and the modern corporation (including the impact of transnational corporations), critiques of corporate capitalism and specific approaches to industry policy are discussed.

References

BS214 Industrial Relations
Prerequisite, BS111 Economics I

In this unit, the nature of an industrial relations system is considered, with emphasis on the Australian experience. Particular emphasis is directed towards the economic environment and its impact upon the behaviour of the parties in the system. Topics to be covered include:

(a) relationship between the industrial relations and economic systems;
(b) parties: the industrial relations and economic roles of trade unions, employer associations and industrial tribunals;
(c) rule-making processes: with particular emphasis upon dispute settlement and wage fixation.

References
Hyman, R. Strikes, Lond., Fontana, 1974

BS311 Public Finance
Prerequisite, BS111 Economics I

This unit involves an analysis of the economic rationale of government expenditure and revenue raising. It will cover the following topics:

(1) an introduction to welfare economics and its implications for government economic policy
(2) taxation analysis: criteria for evaluating taxes and tax systems; analysis of personal and corporate income tax with particular emphasis on the tax unit, the tax base and tax rates; analysis of present sales tax and excise tax arrangements and alternatives to these forms of consumption taxes. Schemes to reform the Australian tax system
(3) techniques to analyse the provision of goods and services by the government sector with particular emphasis on cost benefit analysis as a means of evaluating government expenditure programs.

References
Australia, Treasury Taxation Papers Nos. 1-15. Canberra, 1974

BS315 Monetary Economics
Prerequisite, BS111 Economics I

This unit provides a study of the nature of and developments in Australian finance markets and considers various aspects of monetary theory and policy. The topics to be studied include:

(1) finance markets: nature and role of finance: economic development and financial development; evaluating the performance of finance markets; short-term money markets — official, buy back, commercial bill, and inter-company loan; capital markets — primary and secondary; rigidities and distortions in the finance markets; the question of controls
(2) monetary theory: classical, Keynesian, neo-Keynesian and modern quantity theories of the relationship between money and output, employment and prices
(3) monetary policy: choice of policy instrument; rules and discretion; strength of monetary policy; monetary policy in Australia.

References
BS317  Labour Economics
Prerequisite, BS111 Economics 1

Although second year economics is not formally required, students are advised to complete either BS211 Managerial Economic Analysis or BS213 Industry and Government before attempting this course of study.

This unit emphasises contemporary problems in the Australian labour market. Topics to be covered include: the role of labour in industrial society; factors determining the supply of and demand for labour; wage determination including the role of wages in the prevailing environment of inflation and unemployment (including an examination of policy initiatives such as indexation and prices and incomes control); inequality and discrimination in the labour market; policy measures to deal with the growing structural problems in the Australian labour market, for example, manpower planning.

References

BS318  Urban Economics
Prerequisite, BS111 Economics 1

In this unit, students develop an analytical approach to appraising urban problems and policies. While the emphasis is on economic analysis, part of the course is devoted to discussing sociological and town planning perspectives of urban problems. This recognises that urban problems are multi-faceted, demanding a multi-disciplinary approach. The unit covers the following broad areas: economic analysis and urban problems, urban location decisions, decentralisation, government and private roles in urban development, public policy and urban problems with particular reference to transport, real estate and the environment.

References
Harrison, A.J. Economics and Land Use Planning. Lond., Croom Helm, 1977

BS319  International Economics
Prerequisite, BS111 Economics 1

This unit provides a study of international trade, and finance with special reference to Australia. Topics covered include: the nature of foreign exchange markets and the determination of exchange rates; balance of payments adjustment mechanisms; internal and external policy mixes — Australian policy aspects; international financial arrangements — historical developments, and current issues; the basis of international trade and the determination of trade patterns; trade restrictions; alternative approaches to industry development; Australia's industry assistance policies — current debate; international investment; international development issues e.g. economic integration, a new international economic order.

References
Industries Assistance Commission Annual Report. Canberra, AGPS
Kasper, W. and Parry, T.G. Growth, Trade and Structural Change in an Open Australian Economy. Kensington, Centre for Applied Economic Research, University of N.S.W., 1978

BS091  Personal Typing
Four hours per week
Prerequisite, nil
Assessment by tests

A semester subject designed to teach students to type by touch, to a minimum speed of 35wpm; to produce personal business letters; to set out and type correctly, a report in its entirety.

Textbook

Other business subjects offered
Accounting 1, Business Law, Administrative Studies 1, Computing Methods, The Australian Legal System, etc. See the Business Faculty handbook for full details.
Graduate courses

Graduate Diploma in Applied Social Psychology

The Graduate Diploma program in applied social psychology has been designed to develop an understanding of social processes, and competence in interpersonal skills and social research methodology. Particular emphasis is placed on the application of psychological knowledge and techniques in social and organisational settings.

Entrance requirements

Applicants must have a degree with a major in psychology, or equivalent, from a recognised university, college or institute. Students lacking an adequate background in social psychology may be required to complete appropriate subjects in the Bachelor of Arts degree course or, in selected cases, a preliminary reading course, before being accepted for enrolment. A reasonable standard of statistical competence is required also.

General course structure

The course has been designed to be taken by part-time study over two years, or full-time study over one year. The course comprises eight subjects in all and each subject involves three hours of class meetings per week for one semester. The focus throughout is on experiential learning. In addition to group learning, preparation of papers, and so on, students are expected to undertake a research project which involves field work such as interviewing, together with data analysis and report writing. Some of the subjects include role playing of interviews, small group laboratory exercises, and exercises using computer facilities. It is customary for a full-time period of three weeks in each year of the course (six weeks for full-time students) to be devoted to practical training in an employment situation.

The part-time course

Part-time students take two subjects each semester, and for each of the four semesters there is one subject dealing with theoretical issues and another dealing with skills training and methodology. The study program for part-time students is as follows:

First year, semester 1

AT450 Applied Social Psychology
AT451 Research Design and Analysis

First year, semester 2

AT452 Ethical Aspects of Social Research
AT453 Quantitative Methods in Social Research

Second year, semester 1

AT454 Individual and Social Change
AT455 Small Group Processes

Second year, semester 2

AT456 Issues in Social Psychology
AT457 Special Applications Options

The full-time course

Full-time students will take four subjects each semester. The study program for full-time students is as follows:

Semester 1

AT450 Applied Social Psychology
AT451 Research Design and Analysis
AT453 Quantitative Methods in Social Research
AT455 Small Group Processes

Semester 2

AT452 Ethical Aspects of Social Research
AT454 Individual and Social Change
AT456 Issues in Social Psychology
AT457 Special Applications Options

Progress through the course

Usually the course can be completed in a minimum of two semesters for full-time students, but a maximum of six semesters is allowed for completion of the required eight subjects. A program review committee of the Psychology Department will consider students' progress at the end of each semester.

Applied social psychology subject details

AT450 Applied Social Psychology

This subject presents students with a broadly-based model of applied social research, and then examines paradigms for social research in three areas: opinion or attitude research, assessment of welfare programs or services, and market research. Visiting lecturers who are currently working as researchers in these areas contribute to the course. As part of the course, students are required to undertake a three-week period of supervised practical work in an appropriate organisation or agency.

Preliminary reading


AT451 Research Design and Analysis

This subject reviews research designs and tools which are appropriate for the study of social processes, with particular emphasis on social survey techniques and field investigations. The theoretical bases of these techniques are studied, and students are encouraged to explore solutions to the problems of conducting research in a wide social context.

Major topics include: sampling; questionnaire construction and use; interview surveys; research planning and objectives. Students are required to complete two major assignments—an essay on the application of social psychological research methods in the investigation of a particular social phenomenon, and a detailed proposal for their individual research projects.

Textbook


AT452 Ethical Aspects of Social Research

In this subject, the philosophical, ethical and political issues involved in contemporary social research practices are examined. Starting with a consideration of the values implicit in social research, the course explores a number of areas of concern to the practising social researcher, including methods of evaluating proposed research (such as cost-benefit analysis)
and working with professionals from other disciplines (notably medicine, law, economics and political science), or in an interdisciplinary team. Finally, there is a review of the standards of conduct expected of the professional psychologist, and of other professional considerations.

**Preliminary reading**

**AT453 Quantitative Methods in Social Research**
This subject provides a conceptual framework for understanding multivariate analysis and interpretation of social research data, and provides students with an opportunity to become familiar with the use of a range of multivariate techniques. Topics involved include profile, cluster, factor, discriminant and multiple regression analyses; analysis of variance and analysis of covariance.

Students are required to complete graded assignments involving use of the computer for the analysis of data, plus a major assignment requiring them to discuss the models and assumptions relating to the statistical procedures considered.

**Textbooks**

**Preliminary reading**

**AT454 Individual and Social Change Processes**
This subject provides a review and extension of the major areas of social psychological theory and research relating to change — both planned and evolutionary. The course concentrates on theoretical formulations and significant research developments, with emphasis on such topics as: attitudes and attitude change, obedience and conformity, resistance to change, interpersonal influence and adaptation to changed life-situations.

**Preliminary reading**

**AT455 Small Group Processes**
In this subject, the dynamics of small group situations are examined. This provides students with an awareness of their own and other individuals’ modes of interpersonal functioning. They become familiar with a variety of conceptual frameworks used in analysing small group processes and are given the opportunity to develop skill in observational techniques. Interviewing and the presentation of persuasive communications to a group are also examined.

**Textbook**

**AT456 Issues in Social Psychology**
Current conceptual issues in the field of social psychology are considered in terms of their implications for the understanding of social behaviour and the work of the social researcher. Following these considerations, paradigms are examined for social research in two areas: research on the implications of social policies, and organisation evaluation. As part of this subject, students are required to undertake a three-week period of supervised practical work in an appropriate organisation or agency.

**Preliminary reading**

**AT457 Special Applications Option**
This subject provides for students to gain research experience by carrying out an individual research study under staff supervision, and by presenting the results of this study in the form of a thesis. The thesis is one of the major requirements of the graduate diploma course, and is assessed by two examiners, one of whom is usually the students' research supervisor.

**Textbook**
Graduate Diploma in Urban Sociology

This course is designed to supplement students’ general education by providing them with the practical and conceptual skills necessary to work more effectively or secure employment in the fields of planning, community organisation, urban administration and research. More specifically the course is designed to provide knowledge of and experience in:

(a) the analysis of Australian urban development and its social impacts;
(b) the formation of national, state and metropolitan urban policies;
(c) the organisational processes and use of techniques and skills relevant to urban planning, administration and community organisation.

Entrance requirements

Applicants must hold a degree or diploma from an approved tertiary institution, including major studies in at least one of: sociology, politics, economics, geography, planning or contemporary history. Students with majors in disciplines other than those listed, may be considered also.

Course structure

The course entails one year of full-time study or two years’ study part-time, involving seven semester subjects and a research report.

The following subjects are offered:

- AT480 Advanced Urban Research
- AT481 Research Report
- AT482 Urban Policy
- AT483 Urban Social Theory
- AT484 Current Urban Research
- AT485 Metropolitan Decision-making
- AT486 Comparative Urbanisation
- AT487 Sociology and Planning
- AT488 Introduction to Town Planning
- AT489 Community Organisation

Each student is expected to complete a major research report relating to either policy issues or some aspects of urban administration and planning or community development. It is hoped to develop the research in cooperation with government departments, consultancy firms, community groups and research institutes.

Further subject details and time-table arrangements are available from the Chairman of the Social and Political Studies Department.

Liberal Studies

The following subjects taught by the Liberal Studies Department form an integral part of the courses offered by the other faculties: Science, Engineering, Art and Business.

They are specifically included to broaden the scope of students’ general education in the areas of communications, report writing, the social sciences, public speaking, supervision and other essential areas.

These subjects are not available to Arts students.

Subjects for Engineering students

AT194 Thinking and Communicating

Two hours a week for two semesters

Assessment is continuous

A first-year subject for all Engineering students. The subject is designed to develop students’ skills in communicating through the spoken and written word. Students are expected to master basic thinking processes used in the analysis and synthesis of selected material appropriate to the engineering profession. Creative thinking and decision-making as they relate to engineering also form a part of the process of developing communicating skills. A segment of the subject matter is concerned with the development of personal and social awareness, as part of the communicative process.

Preliminary reading

There is no prescribed preliminary reading.

AT293 Liberal Studies

(Manufacturing engineering)

Three hours per week for fifteen weeks

Assessment is continuous

The aim of this subject is to introduce students to the various concepts surrounding employment in a modern industrial society. As a result of this introduction, students become aware of the necessity for an interdisciplinary approach to industrial affairs.

Areas to be covered in this course are:

- Industry: personal and interpersonal communication skills applied to the work situation and applied to community relations. Influence of physical setting in communication.
- Behaviour of work groups: use of learning theories in acquiring new behaviours and modifying existing behaviours.
- Physiological factors in our sense of well-being — stress, anxiety, drugs and food.
- Minority groups in industry: groups which are affected by technological change, the unemployed, migrant women.
- Industrial democracy: decision-making, worker participation, industrial conflict and the ways to resolve conflict, and trade unions.

Basic requirements are active participation in a seminar-type class setting and thorough knowledge of the textbook.

Textbook


General electives for engineering students

The electives listed below are available for all civil, electrical and electronic, manufacturing and mechanical engineering
students in the second and later years of their courses. The number of elective units offered each year is governed by demand and the availability of appropriate staff.

The subjects are:
- Applied Psychology
- Law and Society
- Writing and Interpersonal Communication
- Writing for Pleasure and with a Purpose
- Technology and Social Change

Details of these and other possible electives are available from the Liberal Studies Department of the Arts Faculty, in the B A Building, Room B3913, telephone 8198067.

**GS395 Report Writing**

Usually one hour per week for two semesters

For chemical engineering students, two hours per week for one semester

Assessment is continuous

A third-year subject in the engineering diploma.

Outline of syllabus:
- the use of the resources, facilities and services of a modern, technical library;
- the compilation of topic bibliographies and the evaluation of information sources;
- the collection, collation, organisation and representation of research information, and its interpretation in the light of the students' own findings and opinions;
- the presentation of written and oral reports on technical topics, in accordance with the format, style and conventions required by the appropriate professional body.

The technical topic chosen is, in some cases, an investigation carried out as part of the practical course for final year.

Recommended reading
Phillips, G.R.E. and Hunt, L.J. *Writing Essays and Dissertations*, 2nd edn, Nedlands, University of Western Australia Press, 1975

**GS493 General Studies**

(Manufacturing engineering)

Three hours per week for fifteen weeks

Assessment is continuous

This subject encourages the student to be an on-going self-teacher. To this end the content is eclectic with a strong psychological and self-development bias. Topics covered include technological and social change and individual adjustment to this change, psychological aspects of communication, thinking with concepts, divergent and convergent thinking, defence mechanisms and early-learning experience, conflict and anxiety, marriage, family and interpersonal relations with application of the family paradigm to relations in industry.

The learning situation includes the use of audio-visual and film. Students are required to deliver a class paper as well as to participate actively in a seminar-type learning situation. Evidence of active reading in mutually agreed areas is required.

Recommended reading

**EP451 Production Design — degree**

(Manufacturing engineering)

One hour per week for one semester

Assessment is continuous

A segment of this subject involves communications, taken by the Liberal Studies Department.

**EP325 Industrial Management**

(Manufacturing engineering)

One hour per week for one semester

Assessment is continuous

A part of this program is concerned with philosophy and psychology in industry, especially interpersonal and social influences. Particular attention is given to personal function in industrial management.

**AT691 Urban Sociology**

Three hours per week for one semester

Assessment is continuous

Graduate diploma subject in urban systems — civil engineering.

This seminar program involves an introduction to sociological concepts, particularly theory of social stratification. Emphasis is placed on the relationships between social structure and aspects of inequality in Australian cities. There is also discussion of the relevance of social science to some areas of public policy, e.g. poverty, housing, transport.

**AT692 Energy Policy Formation**

Two hours per week for one semester

Assessment is continuous

Graduate diploma subject in energy systems.

This subject presents the factors involved in the formation and implementation of public policy in Australia, with particular emphasis on the development of national and state policies on energy. This is achieved through a study of the process of policy formation, and the powers and responsibilities of all levels of government. The rights of individuals and special interest groups are considered in the context of the making of policy in a democratic society. Students are encouraged to pursue their studies through case studies related to lectures and tutorial material, with the purpose of developing an awareness of policy formation and its social impact. Where appropriate, policies are discussed in the world context.

Recommended reading
EP526 Elective — Industrial Management
Three hours per week for one semester
Assessment is continuous

This subject includes the following topics:
our culture in an anthropological perspective;
the place of interpersonal skills and conceptualising in management; the use of conceptual models — understanding one's preferred model and using other models to arrive at an optimum answer;
conditioning — classical and operant; positive and negative management styles; freeing for growth; defence mechanisms; listening; filters; categorising; communication networks, relaxation; positive and negative stresses;
constructive use of change;
dynamic conservatism;
assertiveness training and self-esteem;
confronting conflict;
creative use of conflict.

EC692 Communications
Four hours per week for one semester
Assessment is continuous

A subject in the graduate diploma in civil construction.
The theory and practice of communications. Students take part in a program designed to increase their personal capacities to understand and communicate well at different levels of oral and written communication, particularly as project managers in the construction industry. To this end various techniques are used and evaluated by the group. The course also includes a brief study of the historical role of the engineer in the development of human communications, placing the profession in its social context. The purpose of the course is to enable the engineer to evaluate professional problems more competently and to communicate ideas more effectively.

Subjects for Applied Science students

AT191 Health and Society
Two hours per week for one semester
Assessment is continuous

A first-year subject in the diploma course in applied science (environmental health).
In this subject psychological principles in human behaviour are examined, covering areas such as:
genetic determinism in behaviour; learning principles applied to human behaviour; communication processes and the practical application of these in one-to-one communication;
rôle development and how society reinforces different rôle patterns in people of different ages, backgrounds and sexes.
Recommended reading

AT192 Social Science 2
Two hours per week for two semesters
Assessment is continuous

A second-year subject in the diploma course in applied science (applied chemistry).
Details of the program to be followed are available from the head of the Department of Liberal Studies.

AT392 Report Writing
One hour per week for one semester
Assessment is continuous

A third-year subject in the diploma course in applied science (applied chemistry).
There is no formal syllabus, but training is given in the efficient use of library facilities for the investigation of technical topics at final year level. A detailed study is undertaken of the techniques of report writing, including the search for and the collation of information, its organisation and presentation in oral and written form.

AT393 Communication Studies
One hour per week for one semester
Assessment is continuous

A third-year subject in the degree course in applied science (double major in applied chemistry).
Training in the presentation of oral reports. Each student is expected to present two oral reports; one on work experiences, the other a critical assessment of a scientific or technical topic. A satisfactory standard of presentation is required for a pass in this subject.

AT394 Report Writing
One hour per week for one semester
Assessment is continuous

A third-year subject in the degree course in applied science (applied chemistry — biochemistry option).
Training in the presentation of reports. Each student is expected to present two oral reports; one on work experiences, the other a critical assessment of a scientific or technical topic. A satisfactory standard of presentation is required for a pass in this subject.

**AT493 Brain and Behaviour**

Four hours per week for one semester

Assessment is continuous through short tests and an assignment

A final year subject in the degree course in applied science for students majoring in biophysics.

This subject provides an introduction to areas of human behaviour which are outside but complementary to the study of biophysics. The topics range over such areas as neuroanatomy, learning theory, memory, stress, and social theories of abnormal behaviour. Lecturers are drawn from various disciplines and particular areas of practice to enhance the quality of teaching and to increase the practical aspect of the course. Students are also introduced to some behavioural and communication skills which should be of benefit both in their private and in their professional lives.

Preliminary reading

Reading and other resources are given where appropriate.

**Subjects for Art students**

**AT193 Applied Writing**

Two hours per week for one semester

Assessment is continuous, based on class participation and practical work

A first-year subject for all graphic design students. The course is designed to develop formal and creative writing skills appropriate to graphic design. Attention is given also to the analysis and interpretation of written and visual material, clarity and accuracy in the presentation of ideas, and writing techniques employed in applied areas, such as copy writing, design rationales and publications.

**AT294 Social Science 2**

Two hours per week for two semesters

Assessment is continuous

A second-year subject in the diploma course in graphic design.

Social science and communications

The subject is designed to develop social science and communications skills which are related to graphic design. The social science element provides information about Australia's social profile and this is integrated with the development of written and oral communications skills, especially those that are complementary to graphic design. A further development is based on a particular interrelationship between social science and communications, i.e. social research.

A number of social groups are examined and used as the basis for a communications exercise, both oral and written. Written communications skills include the writing of objectives, working out rationales, planning a schedule, writing reports and submissions, and writing copy. Oral skills include interviewing, responding, non-verbal language and assertiveness training.

Social research techniques to be examined include defining populations, sampling, defining the characteristics of target populations, creating a questionnaire, interviewing and desk research. Students are required to put these techniques into practice and in doing so, become aware of the applications of social survey skills to market research. Students also have the opportunity to test public response in relation to their own design work through exercises in community service promotions as part of AR201 Assigned Projects 2.

**AT391 Applied Psychology**

Two hours per week for two semesters

Assessment is continuous

A third-year diploma subject which is designed to increase personal and social skills through the study of communications. This includes learning models, assertiveness training, stress management and sensory and interpersonal perception.

**AT395 Applied Psychology**

Two hours per week for two semesters

Assessment is continuous

A third-year degree subject which introduces the student to the study of psychology and those areas relevant to marketing and advertising. The intention is to have the student demonstrate a knowledge of concepts and research in psychology, and to help understand the application of psychology to the area of marketing. It helps the student to show an understanding of human needs and motivation by the analysis and creation of effective persuasive material. This is achieved by individual research projects on relevant areas of psychology and marketing for the first semester, and the psychological analysis of media material in second semester.

**AT492 Theory of Communications**

Two hours per week throughout the year

Assessment is continuous

The subject is a practical introduction to the wide range of written and spoken communications used by graphic designers. Topic areas include reference to the spoken and written word, information sources, information reduction, originality and innovation, writing copy, headlines and captions, words and music, use of background sound, product identity, use of humour, names and naming. Complementary topics include the importance of the press in advertising, institutional public relations, advertising models, definitions of advertising, sales promotion, market research, controversy advertising, and communications in the agency.

A stimulating thematic approach is adopted. This method also serves as a useful problem-solving model immediately applicable to the professional work situation. Each session has a theme similar to an actual work assignment.

**Subjects for Business students**

**AT295 Business Communication**

Two hours per week

Prerequisite, nil

Assessment by assignment and test

A year-long course designed principally for students of private secretarial practice, to assist them in the preparation of letters, memos and other business documents; to improve their knowledge and understanding of the English language; and generally to facilitate communications between persons or groups within the business structure.

Textbooks

Lists available on enrolment
AT693  Psychology and Interpersonal Skills

Three class hours per week for two semesters
Assessment is continuous

This course is designed for students taking the Graduate Diploma in Organisation Behaviour.

The objectives are:

(1) to introduce basic psychological concepts and techniques relevant to personal and inter-personal behaviour;

(2) to help participants determine their own perceptual and learning styles, values, attitudes and motivations and to gain insight into how these may interact with behaviour;

(3) to increase communication options through learning particular skills;

(4) to increase access to personal and community resources.

The methods used in a largely co-operative approach are mainly experiential. Participants have the opportunity to acquire cognitive models, and also to put these models into practice.

Reading and other resources are given where appropriate.
business

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— Degree of Bachelor of Business ...............-BS5
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Faculty of Business
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W.C. Nash, BCom, MBA, DipEd

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D.V. Hawkins, BCom, DipEd, AASA
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P.O. Xavier, BEc(Hons), MA

Senior Tutors
Julie Gerstman, BA, BEc
Hannah Piterman, MEc.
### Courses offered in the Faculty of Business

<table>
<thead>
<tr>
<th>Course title</th>
<th>Length of course (Minimum)</th>
<th>Entrance requirements</th>
<th>Special comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Associate Diploma of</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>— Private Secretarial Practice</td>
<td>2 years full-time</td>
<td>0</td>
<td>Four subjects (including English) at Year 12 or equivalent</td>
</tr>
<tr>
<td><strong>Bachelor of Business</strong></td>
<td>3 full-time 6 part-time</td>
<td></td>
<td>For the degree course, it is advisable to have studied mathematics at least to fifth form (Year 11) level.</td>
</tr>
<tr>
<td>— Accounting</td>
<td>3 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>— Applied Economics</td>
<td>3 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>— Data Processing</td>
<td>3 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Diploma</strong></td>
<td></td>
<td>0</td>
<td>An appropriate tertiary degree or diploma.</td>
</tr>
<tr>
<td>— In Accounting</td>
<td>2</td>
<td></td>
<td>For the Graduate Diploma in Accounting, applicants must have a degree or diploma in that field.</td>
</tr>
<tr>
<td>— In Business Administration</td>
<td>2</td>
<td></td>
<td>For the other Graduate Diplomas a limited number of places are available for applicants with no formal qualifications but considerable work experience.</td>
</tr>
<tr>
<td>— In Management Systems</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>— In Organisation Behaviour</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Degree Conversion Course</strong></td>
<td>1½</td>
<td></td>
<td>Diploma of Business from a recognised Victorian institution</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For diploma holders to convert to a degree</td>
</tr>
</tbody>
</table>
Entrance requirements
The minimum entrance requirement for all undergraduate courses is the satisfactory completion of HSC (year twelve). A study of mathematics to at least Leaving level (year eleven) is also advised because of the importance of mathematics in business courses.

Since the number of applicants invariably exceeds the number of places available, selection is based on examination marks achieved.

Tertiary Orientation Program
The Tertiary Orientation Program which precedes the first or common year is recognised as an HSC (year twelve) equivalent. Details of this program appear in the Swinburne Technical college section of this handbook.

Common year
All undergraduate students follow a common first year program which consists of introductory studies in accounting, applied economics, administration, data processing, quantitative methods and business law.

Second and third years
In second year students are free to choose between Accounting, Data Processing, or Applied Economics as a major area of study, and from a wide choice of elective subjects to complement these majors for the remainder of the course.

Exemptions
Exemptions may be granted for tertiary subjects studied at another institution; the maximum is six (or 12 units). See the Bachelor of business, degree course structure for unit values.

Applications should be made on a form available from the Student Records office accompanied by a photostat copy and the original of the certificate gained. The original will be returned after being checked. Students are advised to lodge these applications at the earliest possible moment. The same advice would attach for requests to complete subjects at some institution other than Swinburne.

Notice boards
Information for the benefit of all students is displayed on the notice boards on level 2 of the Business and Arts (BA) Building and it is advisable to check these from time to time. Other assistance is available at the general office of the business faculty on level 9 of the BA building.

Textbooks
Students are advised to wait until the first lecture in each subject/unit if they are in doubt as to which textbook/references they should buy.

Standards of progress
All students, both full- and part-time are expected to maintain a minimum academic standard in order to be allowed to continue their studies.

The following criteria are those usually applied and unless otherwise specified, these refer to students enrolled in all Business courses:

1 Minimum standard of progress
   (a) both full- and part-time students will be expected to pass each year in at least 50% of the subject/units for which they remain formally enrolled at the examination date;
   (b) full-time students will be expected to complete the requirements of the first (common) year of the degree/diploma course within two years;
   part-time students will be expected to complete the requirements of the first (common) year of the degree/diploma course within four years;
   (c) degree conversion — students will be expected to complete the selected units of this course within four semesters;
   (d) further provisions apply in postgraduate courses (see the course descriptions in this handbook).

2 Review
The progress of each student is reviewed at the end of each year or at other appropriate times.

Those who fail to reach the required standard will be advised of the course of action recommended in their particular case. If they wish to appeal against the recommendation, they may do so in writing to the Faculty Secretary, within the specified time. Students may be required to attend an interview with the Review Committee to discuss their particular case.

If unsuccessful in an appeal against a recommendation for exclusion from further study, students will be advised by letter from the Director of the Institute. This exclusion will remain in effect for two years, after which an application for re-enrolment may be made.

3 Conditions of enrolment: number of subjects/units
   (a) Full-time
   Usually full-time students will remain enrolled for 4-5 units per semester.
   (b) Part-time
   Usually part-time students will remain enrolled for 2 units per semester.

4 Withdrawal from subjects or units
Students are required to withdraw from a subject/unit by a date specified for each semester (the seventh week), otherwise, the result in that subject/unit will be shown as a fail. Provided a student withdraws in the correct manner and in due time from a subject or unit, the subject withdrawn will not be counted as a fail or used in the assessment of progress. However, attention is drawn to (3) above, outlining the faculty expectations as to a standard enrolment per semester.
5 Transfer between part-time and full-time study
A student can transfer between full- and part-time study at normal re-enrolment times without special request.

6 Admission to examinations
Enrolment and satisfactory completion of prescribed assignment work, are normal prerequisites for admission to any final examination.

7 Withdrawal from study
A student who wishes to withdraw from study or to change a unit at any time during the year, should first discuss the difficulties with the tutors concerned.

8 Requests to complete subjects away from Swinburne
These should be lodged with the faculty secretary before enrolling in those units, at another institution.

Business courses

Bachelor of Business (BBus)
The degree course leading to the award of Bachelor of Business offers major studies in accounting, data processing or applied economics, and special elective studies in accounting, economics, data processing, the business environment, quantitative methods and law.
Some aspects of the three major streams are as follows:

Accounting stream
This training program provides graduates with a sound background in the accounting skills necessary for a variety of employment opportunities in this particular field. It enables students to adapt to changing occupational demands and in particular, to any one of many different accounting systems. The array of techniques available to management has multiplied in recent years and the accountant must at least be aware of what is involved in the areas of operations research, data processing and statistics for example, without necessarily specialising in them.
Accountants are employed in many diverse and challenging fields. These include management consulting, taxation, information science, business finance, banking, auditing systems design and corporate investigation. Other related areas are marketing, electronic data processing, real estate, stockbroking and the administration of various governmental instrumentalities.

Data processing stream
Employment opportunities for graduates in data processing are many and varied and the present shortage of trained data processing professionals is a continuing problem in the management of many businesses.
To keep pace with the increasing use of data processing, students cover accounting, economics, the business environment, quantitative methods in some depth, as well as a wide spectrum of data processing topics.
Although a graduate's first job will probably be in the field of programming; knowledge of other business-oriented disciplines as well as basic training in systems analysis and design will eventually lead to the fields of computer systems design or applications systems analysis.
Data processors need to:
(a) understand information systems and their relevance to the organisation in which they operate,
(b) be able to analyse systems to determine information requirements consistent with management objectives and constraints within the organisation,
(c) be able to apply the basic design and programming theories, principles and techniques, involved in the capture, processing, storing, analysing and presentation of information, in an economic and technically feasible manner,
(d) develop an ability to examine new ideas and technical developments critically and to be receptive to innovation,
(e) appreciate some of the social, moral and political attitudes that affect computer applications,
(f) establish a sound working relationship with other members of a data processing installation, to be able to communicate with colleagues who may not have a knowledge of computer techniques.

**Applied economics stream**

Understanding the nature of the economic system is a fundamental requirement for a career in business, so economics is one of the core subjects studied in the common year of the Bachelor of Business course. More intensive studies in economics provide skills which can be applied in a variety of business vocations.

The combination of economics and quantitative methods facilitates development of analytical techniques relevant to a wide range of business problems. The analysis of statistics such as: gross domestic product, production, employment, retail sales, prices, capital inflow and exchange rates is an important part of the work of those involved in economic research. The qualitative and quantitative skills developed in this course improves the process of analysis. Other areas of application include the fields of economic planning, forecasting and market research.

Students are also introduced to other business disciplines being undertaken in common year (accounting, data processing, law and administrative studies and may develop at least some of these areas in their elective programs. Students seeking to extend their analytical ability in the finance area, for example, may select complementary accounting units, while the selection of marketing units is appropriate for those interested in consumer surveys, product testing and sales promotion. Most graduates are employed in the marketing, planning and research areas of major organisations, such as banks, government and semi-government departments and corporations, private enterprise and industry.

**General**

**Part-time students**

Part-time students will derive considerable benefit from being able to attend daytime classes for at least one unit per semester; they are encouraged to approach their employers for day release for this purpose.

**Full-time students**

Full-time students have four hours each week for lectures and tutorials in each subject.

**Assignments**

Prescribed assignment work is included in the assessment for each subject. The satisfactory completion of these assignments, together with enrolment, are the standard prerequisites for admission to any final examination.

**Degree course structure**

The course comprises twenty-six units. Ten units are studied in the first or common year.

Sixteen units, ten of which are mandatory, are studied over the second and third years.

The three major streams are:

**Accounting**

**Data Processing**

**Applied Economics**

Each major stream includes various aspects of other disciplines and all students consult with faculty advisers before choosing suitable electives, or planning a course of study which will meet the degree course requirements.

**First year (common)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS103</td>
<td>Accounting IA</td>
</tr>
<tr>
<td>BS104</td>
<td>Accounting IB (1 unit)</td>
</tr>
<tr>
<td>BS109</td>
<td>Accounting IC (1 unit)</td>
</tr>
<tr>
<td>BS111</td>
<td>Economics I (2 units)</td>
</tr>
<tr>
<td>BS132</td>
<td>Administrative Studies (2 units)</td>
</tr>
<tr>
<td>BS121</td>
<td>Introduction to Data Processing (1 unit)</td>
</tr>
<tr>
<td>BS108</td>
<td>The Australian Legal System (1 unit)</td>
</tr>
<tr>
<td>SM145</td>
<td>Quantitative Analysis for Business (2 units)</td>
</tr>
</tbody>
</table>

**Second and third degree years**

Full-time students will study 4 units each semester for four semesters; part-time students, 2 units each semester for eight semesters.

The mandatory units are listed in their usual order of completion.

**Mandatory units (10)**

**Accounting**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS210</td>
<td>Management and Cost Accounting (subject)</td>
</tr>
<tr>
<td>BS206</td>
<td>Contract Law</td>
</tr>
<tr>
<td>BS241</td>
<td>Fundamentals of Operations Research</td>
</tr>
<tr>
<td>BS201</td>
<td>Corporate Accounting</td>
</tr>
<tr>
<td>BS207</td>
<td>Law of Business Organisations</td>
</tr>
<tr>
<td>BS306</td>
<td>Taxation</td>
</tr>
<tr>
<td>BS301</td>
<td>Financial Management</td>
</tr>
<tr>
<td>BS328</td>
<td>Information Systems Analysis</td>
</tr>
<tr>
<td>BS303</td>
<td>Advanced Accounting Theory</td>
</tr>
</tbody>
</table>

**Data Processing**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS225</td>
<td>Commercial Programming A</td>
</tr>
<tr>
<td>BS210</td>
<td>Management and Cost Accounting (subject)</td>
</tr>
<tr>
<td>BS226</td>
<td>Commercial Programming B</td>
</tr>
<tr>
<td>BS227</td>
<td>Systems Design A</td>
</tr>
<tr>
<td>BS327</td>
<td>Systems Design B</td>
</tr>
<tr>
<td>BS328</td>
<td>Information Systems Analysis</td>
</tr>
<tr>
<td>BS329</td>
<td>Systems Software A</td>
</tr>
<tr>
<td>BS330</td>
<td>Systems Software B</td>
</tr>
<tr>
<td>BS324</td>
<td>Management Information Systems</td>
</tr>
</tbody>
</table>

**Applied Economics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS211</td>
<td>Managerial Economic Analysis</td>
</tr>
<tr>
<td>BS215</td>
<td>Economic Techniques for Business</td>
</tr>
<tr>
<td>BS213</td>
<td>Industry and Government</td>
</tr>
<tr>
<td>BS231</td>
<td>Marketing I</td>
</tr>
<tr>
<td>BS232</td>
<td>Marketing 2</td>
</tr>
<tr>
<td>BS234</td>
<td>Marketing and the Law</td>
</tr>
<tr>
<td>BS216</td>
<td>Accounting for Marketing I</td>
</tr>
<tr>
<td>BS217</td>
<td>Accounting for Marketing 2</td>
</tr>
<tr>
<td>BS312</td>
<td>Economic Research</td>
</tr>
</tbody>
</table>

Plus one approved unit.
Elective units (6)
Six elective units, other than those already completed as mandatory units, may be chosen from the wide range that is offered. The maximum allowed is eleven units from one discipline, but some may be chosen from other faculties if approval is granted.

Disciplines and unit codes
Accounting
BS103 Accounting 1A or BS104 Accounting 1B (1 unit)
BS109 Accounting 1C (1 unit)
BS201 Corporate Accounting
BS210 Management and Cost Accounting (2 units)
BS216 Accounting for Marketing 1
BS217 Accounting for Marketing 2
BS301 Financial Management
BS302 Advanced Financial Management
BS303 Advanced Accounting Theory
BS304 Auditing
BS306 Taxation
BS310 Budgeting
Applied Economics
BS111 Economics I (2 units)
BS211 Managerial Economic Analysis
BS213 Industry and Government
BS214 Industrial Relations
BS215 Economic Techniques for Business
BS311 Public Finance
BS312 Economic Research
BS315 Monetary Economics
BS317 Labour Economics
BS318 Urban Economics
BS319 International Economics
Business Environment
BS132 Administrative Studies I (2 units)
BS231 Marketing 1
BS232 Marketing 2
BS234 Marketing and the Law
BS331 Organisational Behaviour
BS332 Business cases
BS333 Marketing 3
BS334 Industrial and Legal Aspects of Marketing
Law
BS108 Australian Legal Systems
BS206 Contract Law
BS207 Law of Business Organisations
BS208 Industrial Law
BS209 Legal Aspects of Commercial Paper
BS307 Law of Marketing
BS308 Advanced Company Law
BS309 Law of International Trade
Data Processing
BS121 Introduction to Data Processing
BS225 Commercial Programming A
BS328 Information Systems Analysis
BS226 Commercial Programming B
BS227 Systems Design A
BS327 Systems Design B
BS324 Management Information Systems
BS329 Systems Software A
BS330 Systems Software B
Quantitative
SM145 Quantitative Analysis for Business (2 units)
SM223 Applied Statistics
SM224 Statistical Theory
BS241 Fundamentals of Operations Research
BS242 Linear Programming
BS343 Operations Research Methods
BS344 Simulation
BS345 Quantitative Cases

The number of units offered each year is governed by demand and the availability of appropriate staff.

Professional institutes
Australian Society of Accountants
Accounting stream
To be eligible for provisional membership of the Australian Society of Accountants, satisfactory completion of the mandatory units is sufficient.

For associate membership
Mandatory units plus
Auditing

Data Processing and Applied Economics streams

For provisional membership
Mandatory units plus
Corporate accounting
Management and cost accounting
(Mandatory in Data Processing stream)
Financial management
Advanced accounting theory

For associate membership
Provisional membership units plus
Auditing
Taxation
Contract law
Law of business organisations

Institute of Chartered Accountants
Accounting stream
To be eligible for entry to the professional year of the Institute of Chartered Accountants, graduates must have completed
Mandatory units plus
Auditing

Applied Economics stream
Mandatory units plus
Corporate accounting
Management and cost accounting
(Mandatory in Data Processing stream)
Contract law
Law of business organisations
Financial management
Advanced accounting theory
Auditing
Taxation
**Australian Computer Society**
Data processing stream graduates are eligible for membership of this society. Other graduates may qualify for membership by choosing appropriate data processing electives.

**Institute of Chartered Secretaries and Administrators**
Students who proceed to the Graduate Diploma in Accounting in order to become members of the Institute of Chartered Secretaries and Administrators (ACIS), are advised that a prerequisite for entry to the ACIS is completion of the second year economics subjects, BS213 Industry and Government and BS211 Managerial Economic Analysis.

**Bachelor of Business conversion course**
This is a three-semester (1½ year) part-time course for students who have completed the diploma of business and wish to qualify for a degree. They will be selected on the basis of their diploma results together with a recommendation from the awarding college or institute.

Students who have prior qualifications to the DipBus such as the Diploma of Commerce or the Accountancy certificate, should upgrade this qualification to the equivalent of the DipBus(Acc) at an institution other than Swinburne before applying for entry to the degree conversion course.

**Course structure**
The course comprises six units taken (two per semester) over three semesters. A unit involves four hours per week each semester, in the form of either lectures or classes. Units will be selected from those offered for the degree course.

Each student’s program is planned individually at the time of enrolment and the course is flexible enough to cater for a wide variety of choice of subject matter.

**Provisions**

1. Students are required to take six units but will be precluded from attempting any units, the subject matter of which has been substantially covered in any previous course.

2. This provision must be fulfilled before the final semester of the conversion course is undertaken.

   - DipBus (Acc) students must pass at least one of the following units:
     - BS302 Advanced Financial Management
     - BS303 Advanced Accounting Theory
     - BS310 Budgeting.

   - DipBus (EDP) students must pass at least one of these following units:
     - BS329 Systems Software A
     - BS330 Systems Software B
     - BS324 Management Information Systems

   Every unit will not be offered every year, but students will be advised of the units available at the time of enrolment.

3. Students should complete the course in not more than four consecutive semesters. They will only be allowed to suspend or prolong their studies in very special circumstances.
Faculty of Business

Diploma of Business (Accounting)
1977 revised syllabus
(For students enrolled for first year in 1977 or later)

First year (Common year)
- BS103 Accounting 1A (1 unit)
- BS104 Accounting 1B (1 unit)
- BS109 Accounting 1C (1 unit)
- BS111 Economics I (subject)
- BS132 Administrative Studies I (subject)
- BS121 Introduction to Data Processing (1 unit)
- BS108 The Australian Legal System (1 unit)
- SM145 Quantitative Analysis for Business (subject)

Second year
- BS251 Accounting 2A (1 unit)
- BS252 Accounting 2B (1 unit)
- BS261 Economics 2 (1 unit)
- BS255 Commercial Law (1 unit)
- BS102 Accounting 1S (1 unit)
- AT295 Business Communications (1 unit)

Third year
- Accounting 3A (2 units)
- BS351 Contemporary Accounting Problems
- BS352 Analysis and Interpretation
- Accounting 3B (2 units)
- BS353 Capital Budgeting
- BS354 Advanced Cost Accounting
- BS355 Auditing
- BS356 Taxation Law
- Plus two electives from *
  - BS274 Introduction to Operations Research
  - BS275 Business Forecasting
  - BS276 Computer Programming
  - BS378 Business Systems
  - BS381 Behaviour in Organisations
  - BS383 Marketing
  - BS384 Law of Business Entities
  - BS385 Legal Environment of Business

* The number of elective units offered each year is governed by demand and the availability of appropriate staff.

Total number of units = 25.

Pre-1977 diploma enrolments
Students who began diploma studies prior to 1977 should check previous handbooks or consult with course advisers regarding the course requirements.

Professional institutes
Diplomates are eligible to apply for admission to the Australian Society of Accountants, or to the professional year of the Institute of Chartered Accountants.

Associate Diploma in Private Secretarial Practice

First year
- BS191 Private Secretarial Practice A
- BS111 Economics I
- BS132 Administrative Studies I
- BS122 Data Processing—S (1 unit)

Second year
- BS291 Private Secretarial Practice B (2 units)
- BS281 Human Behaviour in Organisations (1 unit)
- BS282 Secretarial Administration (1 unit)
- BS110 Legal Studies (1 unit)
- BS102 Accounting 1S (2 units)
- AT295 Business Communications (1 unit)

Total number of units = 16.

The Associate Diploma is of two years’ duration full-time and is not generally available on a part-time basis. Students are admitted with or without a background of stenographic skills, additional time being allocated within the course for the development of these. A prior knowledge of accounting and economics would be useful although not essential.

The course is designed for students who wish to become private secretaries at management level. Diplomates are eligible to apply for Licentiate Membership of the Institute of Private Secretaries. Following two years’ experience they may apply for Associate Membership.

Students who require an intensive course in shorthand and typewriting, would be better advised to refer to the Swinburne Technical College handbook where descriptions of business certificate courses are given in detail.

Graduate Diploma in Accounting
The graduate diploma course in accounting is designed to provide an opportunity for students who have an undergraduate qualification in accounting and suitable work experience, to pursue an advanced course of study in accounting and to enhance their career opportunities.

The object of the course is:
1. to assist students to gain a deeper understanding of the theory and practice of accounting in specialised areas of relevance to their employment.
2. to develop an awareness of current problems and issues in accounting; to develop the ability to evaluate these problems critically and to participate actively in programs aimed at their solution.
3. to develop further, the students’ understanding of the inter-relationship between the accountant and other members of the organisation in which they are employed by studying related disciplines such as marketing administration, secretarial practice, economics and operations research.

The program builds on undergraduate studies.
Entrance requirements

(1) Applicants must have an approved tertiary qualification with an adequate accounting content plus at least two years’ related work experience.

(2) Diplomates in commerce (pre-1967 courses) and other members of The Australian Society of Accountants who have not completed a tertiary course of education over three post-HSC years may be admitted to the course, provided they complete certain bridging studies. For example, a diplomate in commerce needs to complete the following units of the diploma of business:

- BS351 Accounting 3A/Contemporary Accounting Problems
- BS352 Accounting 3B/Capital Budgeting
- BS354 Accounting 3B/Advanced Cost Accounting

A student with an accountancy certificate has to pass in BS589 Management, Organisation and People, as well as the above three units before being allowed to proceed to graduate diploma subjects.

Students who complete BS589 successfully will then need seven additional units to be eligible for the award. The number of bridging units required and advice with regard to the balance of subjects to be taken, is given at the time of enrolment.

Course structure

Prior to 1978
Students who enrolled for the first time prior to 1978, must continue their courses under the regulations existing at that time. These are listed in handbooks prior to 1981.

Revised 1978 structure
The course comprises eight units of which four must be selected from Group 1 (including BS651 Current Issues in Accounting) and two from Group 2. The final two units may be either:

(a) two units selected from Group 1 or 2 provided that the units selected form a reasonable course of study and are approved by the faculty enrolling officer, or

(b) a research paper (BS751) which will include some formal preparatory studies in methodology.

The number of units offered each year is governed by demand and the availability of appropriate staff.

Group 1

BS651 Current Issues in Accounting — (compulsory unit)
BS652 Profit Planning and Control
BS653 Auditing and EDP
BS654 Contemporary Auditing
BS655 Corporate Taxation
BS656 Taxation Planning
BS657 Systems Analysis
BS658 Quantitative Approaches to Financial Policy
BS659 Investment Analysis
BS677 Management Systems

Group 2

BS464 Australian Industrial Relations
BS465 Current Issues in Economics
BS584 Marketing Administration I
BS585 Marketing Administration II
BS586 Personnel and General Administration
BS587 Administrative Policy
BS588 Management Organisation and People
BS591 Quantitative Methods in Accounting
BS592 Applied Linear Programming
BS593 Applied Quantitative Analysis
BS751 Research Paper

The range and structure of subjects should meet the detailed course objectives. BS651 Current Issues in Accounting is designed so that students will be aware of the current problems and issues in accounting, and be able to evaluate and assist in solving these problems. It is a flexible, continually changing unit which keeps abreast of contemporary issues.

The specialised accounting units which make up the remainder of Group 1 are designed to enable students to pursue further studies in these areas.

All Group 1 units are designed to encourage students to master the application of concepts to practical situations. This is achieved by means of a large practical assignment in each Group 1 unit as a part of the students’ assessment.

The range of units in other disciplines listed in Group 2 enables students to develop a greater awareness of the inter-relationship between the accountant and other members of the organisation in which they are employed.

Standards of progress

The ‘Standards of Progress’ approved for the undergraduate courses also apply to students in this course. The following should be read in conjunction with paragraph 1(d) of the requirements as a provision applying to Graduate Diploma in Accounting students.

(1) At least one unit must be passed each semester, until all course work is completed, unless a deferral of study is granted by the Graduate Diploma in Accounting, Standing Committee.

(2) Students enrolled in BS751 must submit a research paper in the semester following completion of the course work, although an extension of one further semester may be allowed. Students who are granted an extension are required to re-enrol within three weeks of the commencement of the following semester to confirm their candidature, otherwise a fail will be recorded.

Any student who has failed to submit a research paper of the required standard within the specified time, may apply to the Graduate Diploma in Accounting, Standing Committee to have the research paper topic reconsidered. If the topic is approved the student will be permitted to re-enrol in the unit.
**Professional institutes**

Associate members of the Australian Society of Accountants are eligible to advance to Senior Associate status after having completed the Graduate Diploma in Accounting course. At the same time, students may satisfy the prerequisites of the Institute of Chartered Secretaries and Administrators.

Students seeking admission to the Institute of Chartered Secretaries and Administrators should contact the Institute about entrance requirements prior to commencing the graduate diploma and must include units BS585 Secretarial Practice and Procedures and BS586 Personnel and General Administration, the co-examined units, in their course of study.

**Graduate Diploma in Business Administration**

This program is offered for qualified executives or potential executives, who have not undertaken significant studies in the administration/management fields, but in the course of their employment, feel the need for a broader knowledge of this area.

The program gives candidates:

1. A working knowledge of the factors affecting the task of the manager and methods of analysing these factors. Particular emphasis is on the needs of middle-management of small and medium-sized organisations.

2. An opportunity to examine and practice problem-solving and decision-making in management situations, which should equip students in any type of business organisation with the ability to develop logical and creative approaches to their jobs.

After completion of the program, candidates will have improved their analytical skills and their effectiveness in dealing with managerial responsibilities. Moreover, participants will have a broader outlook, extending beyond their immediate specialist areas.

**Entrance requirements**

Entry is open to graduates who hold a degree or diploma or its equivalent. The program is available also to a restricted number of candidates whose position or experience in employment is sufficient indication of their capacity to complete the course.

Admission is determined by a selection committee. In addition to academic achievements selection depends upon maturity, work experience and executive potential. Accordingly, each applicant is invited to attach to the application form a detailed *curriculum vitae*.

It is expected that most people who gain direct entry to the course should complete the qualification with two years of part-time study, but, in order to continue in the course, students must maintain a satisfactory standard of progress.

**Course structure**

**First year**

- BS457 Introduction to Financial Management
- BS461 Economics
- BS581 Administration of Organisational Systems
- BS594 Quantitative Methods
- BS595 Marketing Management 1

**Second year**

- BS582 Administration of Human Resources
- BS552 Financial Structures and Policy
- BS587 Business Policy
- BS596 Marketing Management 2

The program is an intensive two-year part-time course. Candidates should complete at least four first year units and in some cases (depending on background studies), may be required to complete five. All four second-year units are compulsory. In addition, a series of non-examinable seminars in labour relations is conducted in second year.

The first year introduces candidates to current thought in the area of economics, marketing, finance and organisation theory. Second year covers the important areas of marketing strategy, financial management, human relations and organisational change. These aspects are viewed in the overall light of corporate strategy. Thus, the emphasis in the second year is on the effective application of knowledge acquired in the first year.

Because of the integrated nature of the course, students are required to complete all first-year studies before attempting second year.

**Preclusions**

Depending on previous training, candidates may be precluded from some of the first year units and assigned ‘alternative’ units in their place.

**Alternative units**

These units are available in the evening for those students who are precluded from more than one first year unit. Students in this category who have not studied labour relations before must select BS464 Australian Industrial Relations as their first alternative. Other alternative units are chosen after consultation with members of staff.

The following units may be available in 1981:

- BS561 Current Issues in Accounting
- BS562 Profit Planning and Control
- BS563 Auditing and EDP
- BS564 Contemporary Auditing
- BS565 Corporate Taxation
- BS566 Taxation Planning
- BS569 Investment Analysis
- BS463 Current Issues in Economics
- BS464 Australian Industrial Relations
- BS672 Systems Analysis
- BS677 Management Systems
- BS585 Secretarial Practice and Procedures
- BS596 Personnel and General Administration
- BS591 Quantitative Methods in Accounting

**Standards of progress**

A sub-committee reviews the results of any candidate who fails to reach a satisfactory standard of progress. The decision rests with this committee as to whether the candidate is to be allowed to continue the course.
Methods of study and instruction
More than one method of instruction is used, so active participation is essential. Participants work in groups or syndicates to encourage cooperative thought. In addition to classroom time, formal syndicate studies are programmed for each week. During these formal sessions ample opportunity arises for questions and discussion centred about case studies or short papers prepared by staff members for analysis.

The nature of the work schedule usually requires participants to engage in further syndicate work of a less formal nature. A residential weekend seminar is held in the second year of the course.

Time-table
Sessions for both first and second year units have been organised on a block system. All unit sessions will be offered on Monday morning between 8.00am and 10.00am and between 10.30am and 12.30pm. In addition, special seminar/syndicate sessions will be scheduled for one evening between 6.00pm and 9.00pm.

The units listed as alternative units are offered on different evenings.

Graduate Diploma in Management Systems
The Graduate Diploma in Management Systems involves two years part-time study. Classes are conducted in the evening.

General objectives
This course is offered to people working in a data processing environment who wish to pursue an advanced course of study and improve their career opportunities.

After completing this course, candidates should be able to:
1. develop their understanding of the application of management systems methodology to the problems of commerce, industry and government;
2. evaluate the changes and advances in the field of computing technology and use sound reasoning to determine the applicability of these developments;
3. fully appreciate the effects of various proposed solutions;

Course structure
The course is in two parts, mandatory units and elective units.

The compulsory part of the course is concentrated on the 'systems' side of data processing. The range of the investigation, analysis, design and development of management systems will form a major part of the course. Project and operation management is covered in depth to ensure that students have a thorough understanding of how systems can be developed and operated efficiently.

The course stresses commercial applications with particular emphasis on the involvement of the eventual users of these systems in the process of their development.

The program is made up of eight units and candidates are required to take these from three groups as follows:

Group 1
Unless preclusions apply, the six units are compulsory.
BS672 Systems Analysis
BS673 Commercial Systems Design
BS674 Current Issues in Systems Design
BS675 Systems Project Management
BS676 Operations Management
BS677 Management Systems

Group 2
Students must take one pair of units from this section
BS581 Administration of Organisational Systems
BS588 Administrative Policy
BS565 Current Issues in Accounting
BS562 Profit Planning and Control
BS591 Quantitative Methods in Accounting
BS658 Quantitative Approaches to Financial Policy

Group 3
Students with preclusions in Group 1 units are required to take sufficient electives from this group to make a total of eight units for the course. Candidates have certain flexibility in selecting a combination of units which meet their individual requirements.
Elective units
The four units not chosen in Group 2 plus
BS463 Current Issues in Economics
BS464 Australian Industrial Relations
BS582 Administration of Human Resources
BS583 Marketing Administration 1
BS584 Marketing Administration 2
BS585 Secretarial Practice and Procedures
BS586 Personnel and General Administration
BS654 Contemporary Auditing
BS655 Corporate Taxation
BS656 Tax Planning
BS587 Investment Analysis
*BS678 Systems Development Project (2 units)
* Only students with two Group 1 preclusions and above average results in the first year may elect to take BS678 Systems Development Project. The number of units offered each year is governed by demand and the availability of appropriate staff.

Preclusions
Students with prior training and/or experience in Data Processing may be precluded from Systems Design and/or Commercial Systems Design. This is decided in consultation with staff members when the student is admitted to the course
Other preclusions from Group 1 units usually do not apply. For each, students study an elective unit from Group 3. Students may also be precluded from taking Group 2 and 3 units which they have covered by prior study.

Extension seminars
In addition to normal class contact each student is required to attend six three-hour seminars in each year of the course. The aim of the seminar program is to present the latest developments and trends in the data processing industry.

Suitable applicants
The intake into this course is usually:

(1) data processing personnel progressing past the programmer level into systems analysis and project management;
(2) systems analysts, consultants and some user department representatives who have had considerable experience in the development of management systems.

Entrance requirements
Entry is open to graduate-, who have a degree, diploma or equivalent from a recognised university or other institution. Graduates from any discipline may apply but applicants are expected to have work experience in a data processing environment. Those who lack the required entrance experience may be admitted to the course via bridging studies.
The course is available also, to a number of carefully selected candidates without tertiary qualifications. These comprise only a small percentage of total enrolments.
Applicants are interviewed prior to acceptance into the course to assess their suitability and to determine from which units they are precluded.

Graduate Diploma in Organisation Behaviour
This course is for managers who wish to extend their knowledge of human behaviour within organisations. Most students in this course aspire to, or occupy middle and senior management positions in large or small organisations.
The object of the course is to give candidates:
(1) a knowledge of the human factors that affect the task of management, together with a study of available methods for the analysis of these factors,
(2) an opportunity to examine and to practise problem-solving and decision-making when handling people and problems,
(3) a broadened outlook beyond their immediate area of specialisation.

Course structure
The program is an intensive two-year, part-time course. The subjects (all of which are compulsory) are listed below. The first year introduces candidates to the areas of psychology and interpersonal skills, together with a detailed study of organisation theory.
The second year deals with the management of conflict and change, and leadership. These aspects are examined and put into practice in the overall pattern of organisational strategy.
Because of the integrated nature of the course, students are required to complete all their year one studies before attempting year two.

Year one
AT693 Psychology and Interpersonal Skills
BS681 The Organisation
Both these subjects run for the whole academic year and have a total time commitment of 5 hours per week.

Year two
BS682 Managing Conflict and Change in Organisations
BS683 Management and Leadership in Organisations
Each unit runs for 4 hours per week. The first is conducted in first semester only and the second in second semester.

Entrance requirements
Entry is open to university or other graduates who hold a degree or diploma, or its equivalent. The program is also available to a restricted number of candidates whose position or experience is sufficient to undertake the course. Admission is determined by a selection committee. In addition to academic achievements, selection depends upon experience and development potential. Accordingly, each applicant is asked to attach to the application form a detailed curriculum vitae.

Progress during the course
In order to continue in the course, students must maintain a satisfactory standard of progress, but it is expected that most candidates will complete the course with two years of part-time study.
Methods of learning
A wide variety of teaching methods is employed ranging from structured lectures or discussion to unstructured experiential type activities. Skills relating to work in groups are stressed and these should be developed by active participation in syndicates.

Time-table
Sessions for both year one and year two units are organised on a block system. Both first-year subjects are offered on Wednesday morning 8.00 a.m. to 1.00 p.m. and second-year sessions on Friday 8.00 a.m. to 12.30 p.m. Special or syndicate sessions may be scheduled where appropriate. A residential program is scheduled each year as an integral part of the course.

Lecturers
The teaching program is conducted by staff from the faculties of both Business and Arts.

Prizes
Annual awards are made by the following donors:
The Australian Society of Accountants prize
The best overall diplomastudent in accounting.

The Economic Society of Australia and New Zealand prize
The best student in each of first, second and third year degree economics units.

The Hungerford Hancock & Offner prize
The best student in advanced financial management.

The Australian Computer Society prize
The best student in final year data processing practical work.

The Datec prize
The two best students in second year systems design.

The Arthur Andersen and Co. prize
The best accounting student in each of first, second, and third years.

The Bill Hibble, Arthur Andersen and Co. prize
The best performance in a data processing programming unit.

The Touche Ross and Co. prize
The best performance in degree auditing.

The BP Australia prize
The best student in corporate accounting.

The Coopers & Lybrand prize
The best student in management and cost accounting.

Business subject details

BS091  Personal Typing
Prerequisite, nil
A one-semester unit designed to teach the student to type by touch to a minimum speed of 35-wpm; to produce personal business letters; to set out and type correctly, a report in its entirety.

Textbook
Supplied.

Common year — degree and diploma subjects

BS102  Accounting 1S
Prerequisite, nil
A terminal first-year subject in the associate diploma course in private secretarial practice, in which a basis of accounting theory and techniques is related to the work of the private secretary. Topics include:

1. Basic accounting concepts
2. Data processing — recording techniques and preparation
3. Office accounting techniques and controls, payroll preparation, asset valuations (book and tax records) inventory control relationships to computer systems
4. Accounting for different forms of ownership — sole proprietorships, partnerships, companies, manufacturers, contractors and service performers
5. Interpretation of the balance sheet.

Recommended reading

BS103  Accounting 1A
Prerequisite, nil
An introduction to accounting methods and techniques for students with no prior knowledge of book-keeping or accounting. The unit is divided into three segments. Topics covered include the accounting function; basic concepts and terminology; status reports; performance reports; the accounting equation; recording methods; balance day adjustments; final reports; accounting procedures for control; ledger recording for inventories.
References

Textbook

BS109  Accounting 1C
Prerequisites, BS103 or BS104 Accounting 1B
Accounting theory and practice are examined in a historical cost accounting system. This unit includes the following topics:
Revenue and expenses; accounts receivable; cost of sales and inventory valuation; assets and depreciation; liabilities; accounting for shareholders equity; performance evaluation; analysis and interpretation and funds statements.

References
Barton, A.D., The Anatomy of Accounting. 2nd edn, St. Lucia, University of Queensland Press, 1977

Textbook

BS110  Legal Studies
This unit introduces students to our legal system. The general objectives are:
(a) to provide an understanding of the nature of law, its historical origin and institutional setting in Australia;
(b) to provide an understanding of the conventional processes of legal reasoning used in the system;
(c) to create an awareness of the influence of the judiciary in the law-making function and in so doing to detail areas of substantive law selected from tort and contract;
(d) to create an awareness of the role and limitations of the non-court tribunals and commercial arbitrators as alternatives to the court system;
(e) to create an awareness of the inter-relationships which exist between the courts, parliaments, the non-court tribunals and commercial arbitrators.

References
Bates, N. An Introduction to Legal Studies. 3rd edn, Syd., Butterworths, 1979
Legal Resources Book. Melb., Fitzroy Legal Service, 1977
Pearce, D. Statutory Interpretation. Melb., Butterworths, 1974
BS111 Economics I

In this subject, some of the methods adopted by economists are used, to analyse economic problems within the framework of the Australian economic system. The course commences by examining the role of the contemporary market system in allocating resources and distributing income and wealth. This is followed by a detailed analysis of the determinants of the level and rate of change of output, employment, prices and international reserves. Attention is then focused on the role of fiscal, monetary, prices and incomes, and balance of payments policies in achieving, simultaneously, internal and external balance.

References
Shapiro, E. Macroeconomic Analysis. 4th edn, N.Y., Harcourt, Brace and Jovanovich, 1978
Baumol, W.J. and Blinder, A.S. Economics Principles and Policy, N.Y., Harcourt Brace and Jovanovich, 1979

BS121 Introduction to Data Processing

This unit is an introduction to commercial data processing for business students. Students should develop an appreciation of the possible benefits that may accrue as well as the problems associated with using computers. It provides a basis upon which later units can be built.

Topics include:
- introduction to information systems including system objectives and the flow of data through a system;
- form layouts appropriate for specifying output reports, card input and sequential magnetic files;
- program logic design using pseudocode and coding in COBOL to the level of group reporting from a sequential file;
- input and output devices;
- introduction to systems analysis and design with emphasis on formalising problems and determining systems requirements;
- a survey of the possible uses of computers in business, industry, government and the home.

The theory taught in these topics is substantiated by extensive practical work. Students are expected to complete a case study satisfactorily which includes determining objectives, preparing a program specification, and successfully executing this program using live data.

Textbooks

BS122 Data Processing — S

This unit is compulsory for students studying for the Associate Diploma in Private Secretarial Practice and is available only to students in that course.

Topics include:
- word processing concepts; introduction to computers; introduction to data processing; computer programming; computer packages; word processing systems survey;

References
Current journals including
Modern Office
Ridges

BS132 Administrative Studies I

Two lectures and one tutorial per week throughout the year.

This subject introduces the student to the basic knowledge relating to administrative theory. Students should develop an appreciation of the problems and functions of management, together with a conceptual context in which to synthesise the other subjects studied in the business courses. Emphasis is on those aspects of the behavioural sciences which are relevant to administration, and on the development of the students’ perceptions of themselves as organisation members as well as functional specialists.

The subject develops the following themes:
- the nature and complexity of organisations and their environments; managing human individual differences;
- understanding interpersonal relations and social influences on individual behaviour; group dynamics; intergroup relations;
- organisational effectiveness; the functions of managers in complex organisations; the use of conceptual models, especially the Open System model for problem-solving.

References
Huse, E.F. The Modern Manager. St Paul, West, 1979

Textbooks

BS191 Private Secretarial Practice A

Prerequisite, nil

A first year subject designed to introduce the skills of shorthand and typewriting to trainee secretaries, to use these in a practical manner and at the same time gain background knowledge of business practices and activities. Final speeds of 100/50 respectively, on restricted matter, are required.

Textbooks
Complete booklist available upon enrolment

SI145 Quantitative Analysis for Business

A first year subject in the Faculty of Business common year.

For students without an HSC mathematics or equivalent subject, the course is four hours per week for two semesters.

For students with an appropriate mathematics background, the average time allocation is three hours per week for two semesters.

The primary purpose of this subject is to bring all students up to a level of higher numeracy and to develop a method of approach which they will be able to apply in subsequent areas of their courses. In doing this the subject will provide students with a knowledge of particular techniques in mathematics and statistics so that they may achieve a greater understanding of the quantitative procedures applied in various disciplines of their business studies course. Application, interpretation and presentation of the results of analysis will form an integral part of the course.

Topics covered will include the following: language and notation; functional relationships; differential calculus including determination of maxima and minima, partial differentiation; matrix algebra; introductory mathematics of
finance; presentation of statistical data; measures of central tendency and dispersion; probability theory and probability distributions; sampling theory and design; statistical inference including estimation, confidence intervals; index numbers; correlation and regression; time series analysis.

Optional enrichment units are offered in a selection of topics which includes inventory, Markov chains, decision theory, input-output analysis, sampling techniques, quality control, and tests of hypotheses.

References

Degree units

BS201 Corporate Accounting
Prerequisite, BS109 Accounting 1C
A second year subject in the accounting degree course in which accounting for corporations is studied. Where appropriate, the relevant law is integrated with the accounting. For this to be achieved, emphasis is placed upon the Companies Act and relevant case material.

BS206 Contract Law
Prerequisite, BS108 Australian Legal Systems

The general aim of this unit is to enable students to gain an understanding of the law applicable to bargains or agreements concluded during the course of business. Particular attention will be given to the legal repercussions of negotiating and concluding a bargain (including the impact of statute) and breaching obligations undertaken.

References
Guest, A.G. Chitty on Contracts. 24th edn, Lond., Sweet and Maxwell, 1977
Caffrey, B.A. Guidebook to Contract Law in Australia. 1st edn, Syd., CCH Australia Ltd, 1980
Goods Act 1958 (Victoria)
Trade Practices Act 1974 (Commonwealth)
Bills of Exchange Act 1909 (Commonwealth)

Textbook

BS207 Law of Business Organisations
Students enrolled in this unit will be expected to have passed BS206 Contract Law. This unit is compulsory for students in the accounting stream; optional for others

The aim here is to undertake a comparative analysis of the form of business organisations.

Essentially this involves an analysis of corporations, partnerships, trusts and unincorporated associations.

Prescribed texts
Companies Act 1961
Partnership Act 1958
Trustee Act 1958

References
Horsley, M.G. The Law and Administration of Associations in Australia. Sydney, Law Book Co., 1977

BS208 Industrial Law

The general objective is to analyse the impact of law upon the employment relationship between employer and employee.

The contract of employment will form the core of study. Upon this foundation a number of areas will be studied in depth, including the following:

1. the right to work; the formation of the contract of employment and factors impinging thereon, including discrimination and compulsory unionism.

References
Guest, A.G., Employment Law. Sydney, CCH, 1976
Baxt, R., Employment Law. Sydney, Law Book Co., 1978

BS17
(2) the rewards and obligations of work; an analysis of the operation of the Federal Conciliation and Arbitration Commission, the Victorian Industrial Commission and Conciliation and Arbitration Boards, and the mutual obligations placed on employers and employees pursuant to common law.

(3) the work environment; an assessment of the legal and arbitral response to technological change, management prerogatives and worker-participation.

(4) the cessation of work; an analysis of the judicial, legislative and arbitral response to strikes, wrongful and unfair dismissals, and employment related injuries as factors contributing to a temporary or permanent cessation of work.

References

The Liability of Employers in Damages for Personal Employment.

BS209 Legal Aspects of Commercial Paper
Students enrolled in this unit will be expected to have passed BS206 Contract Law.

The intention is to extend and develop the principles of contract by canvassing such areas as the financing of contractual obligations, the alternative methods of securing such financing and the manner of property acquired pursuant to contract. In analysing these areas it is anticipated that students will develop an awareness of problems associated with presently employed credit, security and insurance practices and the consequent need for reform.

Prescribed text

References
Bills of Exchange Act (Commonwealth)
Instrument Act (Victoria)
Money Lenders Act (Victoria)
Hire-purchase Act 1959 (Victoria)

BS210 Management and Cost Accounting
Prerequisite, BS109 Accounting 1C
A mandatory second year degree subject for both accounting and data processing streams

Recent developments in management science, micro-economics, finance, decision theory, statistics and organisation theory have concurrently created both a greater demand on the management accountant to provide data for a range of management decisions, while simultaneously providing him with many of the tools to fulfil this enlarged role.

This subject is designed to provide students with a concise, broadly-based approach to management accounting.

(1) Synthesising modern management accounting topics examining both rationale and method
(2) Integrating management accounting with other related disciplines
(3) Stressing the design, review and operation of systems for organisational planning, control and evaluation and the implications of such systems on employee motivation and behaviour.

The course consists of the following:
Part A Cost measurement systems
The scope of management and cost accounting; an introduction to the measurement function of cost accounting; job and process costing systems; the allocation problem and a consideration of what costs should be treated as product costs; variable costing and absorption costing, their impact on inventory valuation and income measurement.

Part B Cost control systems
The nature of control systems; responsibility accounting; cost prediction and its role in the control process; the master budget and its role in the planning and control process; standard costing — a dual system for valuing inventories and controlling costs; variance analysis under both variable and absorption costing; flexible budgeting for overhead cost control; behavioural considerations in setting standards and evaluating performance.

Part C Costs for planning and decision-making
Introduction to decision-making; short-run and long-run decisions under conditions of certainty and uncertainty; decision models and their applications; behavioural aspects of decision-making.

Part D Performance evaluation
Management reports for marketing and non-manufacturing management; segment reporting and profit variance analysis; decentralisation and divisional performance evaluation; transfer pricing and its impact on divisional performance evaluation and resource allocation.

Prescribed text
To be advised.

References
Benson, G.J., ed. Contemporary Cost Accounting and Control. 2nd edn, Belmont, California, Dickenson, 1977
National Association of Accountants Research Reports
How Standard Costs are Being Used Currently.
The Analysis of Manufacturing Cost Variances.
The Analysis of Cost Volume Profit Relationships.
Current Applications of Direct Costing.
Australian Society of Accountants
Statement of Accounting Standards DS2
Valuation and Presentation of Inventories in the Context of the
Historical Cost System.

BS214 Industrial Relations
Prerequisite, BS111 Economics I
In this unit, the nature of an industrial relations system is
considered, with emphasis on the Australian experience.
Particular emphasis is directed towards the economic
environment and its impact upon the behaviour of the parties
in the system. Topics to be covered include:
(a) relationship between the industrial relations and economic
systems
(b) parties: The industrial relations and economic roés of
trade unions, employer associations and industrial
tribunals
(c) rule making processes: with particular emphasis upon
dispute settlement and wage fixation.

References
Hyman, R. Strikes. Lond., Fontana, 1974
Niland, J.R. Collective Bargaining and Compulsory Arbitration
in Australia. New South Wales University Press, 1978
Niland, J.R. and Isaac, J.E. Australian Labour Economics
Readings. 2nd edn, Melbourne, Sun Books, 1975

BS215 Economic Techniques for Business
Prerequisites BS111 Economics I; and SM145
Quantitative Analysis for Business (or an
approved equivalent)
The intention here, is to provide students with the techniques
and skills generally used in economic and market research in
business. Emphasis is on the analysis and interpretation of
information which graduates are likely to use in practice.
The topics to be studied include: collection and sources of
data; major economic and social indicators e.g. national income
and social accounts, consumer price index, wage rate index,
productivity estimation, population growth and distribution
estimates; economic modelling, in particular the nature and
purpose of economic modelling; trade cycles and economic
explanations of trade cycles, an assessment of selected
Australian economic models.

References
Australian Economic Review, Institute of applied Economic and
Social Research, Melbourne University.
Australian National Accounts, National Income and
Expenditure, 1978/79 Australian Bureau of Statistics,
Canberra, Australia.
Dixon, P.B., Powell, A.A. and Parmenter, B. R. Structural
Adaptation in an Ailing Macroeconomy. Melbourne University
Press, 1979
Karmel, P. and Polasek, M. Applied Statistics for Economists,
3rd edn, Pitman, Melb., 1970
Matthews, R.C.O. The Trade Cycle. Cambridge University
Press, 1966

BS216 Accounting for Marketing 1
Prerequisite, BA109 Accounting IC
The unit is designed,
(1) to introduce students to the process of cost determination
and control
(2) to enable students to analyse cost behaviour and relate it
to different decision-making techniques.
The unit includes:
The differing concepts of cost; cost behaviour patterns — fixed,
variable, semi-variable; cost/volume/profit analysis — break-
even, margin of safety, operating leverage; determining the
cost of production under both absorption costing and direct
costing; determining the cost of research and development,
marketing, and administration; assessing the effectiveness of
such expenditures; cost control techniques; calculating the
total cost of a product.
References

BS217 Accounting for Marketing 2
Prerequisite, BS216 Accounting for Marketing 1
This unit is designed,
(1) to focus attention on the impact on profitability of various marketing decisions
(2) to provide an analytical framework to enable correct evaluation of various marketing policy decisions
(3) to make students aware of the interrelation between marketing and capital investment
The unit includes:
Evaluation of total profitability using the return on investment model.
Evaluation of alternative marketing and production strategies, viz.,
market research; make or buy; distribution channels; sub-contracting; margin management and pricing; deletion of existing products/services; new product introduction.
Sales analysis to assist marketing decisions reporting segment contributions and profits by product, area, channel of distribution.
Cost allocations.
Working capital management — effect of sales and production on levels of stock, debtors and costs.

References
Beyer, R. Profitability Accounting for Planning and Control, N.Y., Ronald Press, 1963

BS225 Commercial Programming A
Prerequisite, BS215 Introduction to Data Processing
In this unit, a knowledge of the fundamentals of program development and elementary COBOL coding is presumed, as well as an understanding of basic computer concepts.
While ANSI COBOL language facilities are covered in some depth, and solutions to the major programming assignments will be written using COBOL, other industry-accepted commercial languages are also examined and compared. These include BASIC, RPG11 and PL/1.
The following topics are covered.
Language features. Form of the language, program layout, data types, arithmetic instructions, input and output instructions, conditional and loop instructions, editing and data manipulation, table handling.
Program development techniques. The stages leading from the system specification to the coding activity. Problem analysis. Programming aids e.g. pseudocode and structure charts.
Documentation. Program structure. Program design for implementation and maintenance.
Program writing techniques. The economics of efficiency, program debugging, program testing, test data generation, diagnostic aids. Program test documentation, coding standards.
Major programming assignments approach realistic commercial complexity, and include the areas of: group reporting, table handling, sequential file updating.

References

BS226 Commercial Programming B
Prerequisite BS225 Commercial Programming A or BS221 COBOL Programming I
A thorough knowledge of basic programming techniques and the COBOL programming language is presumed. Upon completion of this unit, the student will have experienced all aspects of program development and programmer responsibility, in a simulated working environment. Special emphasis is placed on the application of improved programming productivity techniques.
A selection of the following topics are treated by lecture, research assignment, or programming project:
structured programming; top-down development; development support libraries; team operations; structured walk-throughs; program documentation aids and standards; program estimating; program testing and debugging; direct access file manipulation; data base data manipulation languages; advanced COBOL facilities, such as SORT and Report Writer.
Comparative commercial programming languages, query languages and other special purpose languages.
Job control language and utility program functions.
Introduction to computer operations.
Students are formed into programming teams for major projects, with the lecturer adopting the role of chief programmer, or consultant. Industry supplied system specifications for actual commercial applications are used whenever possible as the basis for these projects, and results are made available for industry implementation.

References
Appropriate manuals from computer manufacturers.
Relevant industry journals.

BS227 Systems Design A
Prerequisite, BS215 Introduction to Data Processing
Students who complete this unit successfully will be able to prepare fully documented design solutions for simple batch systems. After a brief review of the analysis stage of system development, design topics are progressively related to the development of complete, working systems.
The major topics are as follows:
Development of information systems, including the place of systems design in the development cycle, and the constraints and resources of a data processing system.
Defining the system, which looks at the tasks of the systems analyst in establishing a functional specification document.
Computer hardware and software, including all common I/O devices, system, utility and applications software, and typical commercial configurations.
System input and output design, including data capture, coding systems and forms design.

Introduction to file design, including data analysis, data structure and file classifications.

System flow using sequential files, which introduces typical processing tasks and run controls via a complete, documented system

Documentation systems, covering major methods in use

File organisation and processing, including simple file calculations, the characteristics and selection of major access methods, and an introduction to data base.

Run timing: Its relevance, limitations and simple methods

System controls and security, including problem sources, some hardware, software and people controls, backup and recovery, and an introduction to EDP auditing.

Introduction to implementation, including levels of testing, the interface to operations, and maintenance.

References

Relevant material will be discussed for each lecture, however, a general reference and suggested prereading is:


BS231 Marketing 1

Prerequisite: nil

Marketing 1 and 2 deal with the fundamentals of business planning with particular emphasis on the market place.

The subject has been designed to provide students with an opportunity to relate their knowledge obtained in other disciplines, to business situations.

Objective

To give students a broad understanding of the marketing environment.

To give students an overview of the total business function in particular with respect to planning and decision-making.

To enable students to apply their knowledge of accounting techniques, economics and quantitative methods to business decisions.

To increase the practicality of business education by introducing students to business situations. To achieve this, emphasis is placed on case study analysis and management games.

Marketing 1 deals with the fundamentals of marketing and consumer behaviour. The course provides for a broad understanding of marketing problems and introduces the student to the techniques of dealing with such problems.

Syllabus

The marketing concept — an understanding of the interaction between the firm and its environment. The market and an analysis of demand — consumer behaviour; consumption and expenditure patterns; the buying process; market segmentation. The marketing mix — product, pricing, distribution and promotion decisions.

Method of instruction

In a course of this nature active participation is essential. The theoretical aspects of marketing will be supplemented by practical problems through the use of case studies. Students are required to submit group as well as individual assignments.

Degree conversion students who wish to major in the business environment are advised to undertake the marketing units before attempting business cases. Moreover, it is recommended they include Advanced Financial Management in their course.

Reference


BS232 Marketing 2

Prerequisite: students enrolled for this unit should have passed BS231 Marketing 1

This unit enables students to study the marketing environment and the elements of the marketing mix in more depth.

The course is concerned with the formulation of integrated marketing programs. The course framework is organised around the following topics:

The assessment of marketing opportunities, marketing research, the analytical use of data, the marketing planning process. On completion of the course students will have developed an understanding of marketing problems and of the techniques of dealing with such problems.

Marketing research — survey methods, sampling, research strategy. Analytical use of data — the application of accounting and statistical techniques to decision-making in the market place. Product/service policy — life cycle; adoption process; planning; differentiation; packaging; branding.

Emphasis will be placed on case studies and management games as vehicles for active participation by students. Throughout the semester students will be required to submit individual as well as group assignments.

References


BS234 Marketing and the Law

Prerequisite, BS108 The Australian Legal System

The intention is to give students an understanding of some of the legal controls which impinge on the marketing function. Main topics include:

1) Legal controls on advertising, sales promotion and negotiating a contract of sale

2) Legal rights and obligations arising from a breach of contract of sale

3) Legal controls on the financing of credit purchases

4) Legal controls on restrictive trading practices

References

Caffrey, B. Guidebook to Contract Law in Australia. North Ryde, CCH, 1980


BS241 Fundamentals of Operations Research

Prerequisite, SM145 Quantitative Analysis for Business or equivalent.

The unit provides:

An awareness of a range of quantitative techniques and their application to a variety of accounting, economic and business problems.

An understanding of the inter-relationships between operational research methods and the traditional accounting function in an organisation.
A basis for a more extensive study of the application of quantitative analysis in subsequent units.

Emphasis will be placed on the practical solution of specific business problems and in particular on the recognition, formulation and interpretation stages of solution. Areas of study will include:

- the general problem of resource allocation with emphasis on linear programming including a study of duality, an introduction to post-optimal analysis and the determination of transfer prices in a decentralised organisation; use of quantitative analysis to plan and control working capital requirements, including an evaluation of approaches to inventory and cash management problems; forecasting, with particular emphasis on short-term product demand forecasting; general approaches to planning and decision-making including the application of decision theory.

Case studies and assignments will be an integral part of the course and will be evaluated as part of the overall assessment in the unit. They will include the use of packages from the Faculty of Business optimisation library.

Preliminary reading


References

A detailed list of references will be made available during the course.

BS242 Linear Programming

Prerequisite, BS241 Fundamentals of Operations Research or equivalent

This unit examines generally the application of linear programming within the context of realistic business and economic problems. The emphasis of the course will be on formulation and the interpretation and analysis of results.

Topics covered will build on the principles developed in BS241 and will include: duality — its applications and economic significance; post-optimality and parametric analysis with consideration being given to variations in prices, costs, resources, demands and outputs; solution of problems involving choices of production processes and fixed charges, consideration of situations where some or all variables are discrete.

Consideration will be given to specific industry problems in areas such as capital budgeting, sequencing and scheduling. Throughout the unit students will be required to use the Faculty of Business optimisation library of computer programs.

Case studies and assignments will be an integral part of the course and will be evaluated as part of the overall assessment in the unit.

References

A detailed list of texts and journal articles will be made available throughout the unit.

SM223 Applied Statistics

Students enrolled in this unit will be expected to have passed SM224 Statistical Decision Theory.

See details for SM224 to which this unit is complementary. Topics will include the application of chi-square and other non-parametric tests, the analysis of variance for the completely randomised design and the randomised block designs. Bayesian decision analysis, and the application of multiple regression to business and economic relationships.

References


Wonnacott, R.J. and T.H. Econometrics. N.Y., Wiley and Sons, 1970


SM224 Statistical Decision Theory

Four hours per week for one semester.

Prerequisite, SM145 Quantitative Analysis for Business Assessment, one 3-hour examination together with the satisfactory completion of practical work.

A second year subject in the degree course in business offered during the day in first semester and in the evening during second semester. The subject gives students sufficient statistical training to allow them to make meaningful decisions on tests they have designed on available data. To this end SM222 and SM223 are seen as complementary units. Topics studied include methods and principles of statistical estimation and hypothesis testing, sampling techniques and sample design, statistical quality control, decision theory.

Textbook


References


Coyne, R.G. Decision Analysis, Lond., Thomas Nelson and Sons, 1972

Smith, T.M.E. Statistical Sampling for Accountants. Lond., Haymarket, 1976


Diploma subjects/units

BS251 Accounting 2A

Prerequisite, BS109 Accounting 1C

A second year subject in the accounting diploma course.

This subject deals with the formation, growth and termination of partnerships and companies with the major emphasis on companies.

The course of study embraces the accounting and legal aspects of:

- partnerships; trusts; company formation; creation and disposal of surpluses available for distribution; presentation of company reports; reconstruction of share capital; business combinations; group accounting; company liquidations.

References


Bruce, J.H. and Dowd, J.M., Australian Company Accounting. 3rd edn, Milton, J. Wiley & Sons 1978


Victorian Companies Act and Regulations, CCH Australia (latest edition)

Guide Book to Australian Company Law. 3rd edn, North Ryde, CCH, 1976
Australian Society of Accountants: Members Handbook
Students should not purchase any books before the first lecture.

BS252 Accounting 2B
Prerequisite. BS109 Accounting 1C
A second year subject in the diploma course in accounting.
The course is primarily concerned with the problems of establishing product costs for manufacturing enterprises.
These costs are needed for income determination, inventory valuation, planning, cost control and decision-making.
Topics will include:
alternative systems for collecting, recording and classifying costs so that unit product costs can be determined. Job costing and process costing are both covered;
the concept of using predetermined costs instead of actual costs is covered when a standard costing system is compared with an historical system;
the alternative treatments of fixed factory overhead as a product cost under absorption costing and a period cost under variable costing;
the behavioural implications of alternative systems and the relevance of this in determining their effectiveness;
costs for decision-making, including the techniques of cost-volume-profit relationships and discounted cash flow analysis.
The use of budgets for controlling and evaluating performance.
References

BS255 Commercial Law
Prerequisite. BS108 The Australian Legal System
This unit deals with principles of contract and negotiable instruments as examples of the impact of the law on the operation and financing of commercial dealings.
References

BS261 Economics 2
Prerequisite. BS111 Economics 1
The purpose of this subject is: (a) to show how economic analysis can be used in decision-making and (b) to provide a framework for microeconomic policy discussion of the Australian economic environment.

BS274 Introduction to Operations Research
Prerequisites; usually all first year units should have been passed
A second year unit of the diploma course in accounting.
It provides an introduction to some of the more common operations research techniques with which the modern accountant is likely to be concerned. Emphasis will be placed on the recognition of situations to which the techniques could be applied in solving business problems and interpretations of solutions.
Topics will include: linear programming, including specific application to transportation problems, short-term forecasting techniques applicable to inventory management; network analysis with emphasis on Program Evaluation and Review Technique and decision theory;
Case studies and assignments will be an integral part of the course and will be evaluated as part of the overall assessment in the unit. They will include the use of packages from the business optimisation faculty library.
Recommended reading
Taylor, T.H. Introduction to Linear Programming, Methods and Cases. Wadsworth, 1971
Courtie, G.A. Short-term Forecasting. Edinburgh, Oliver Boyd, 1964
Coyle, R.G. Decision Analysis. Londo., Nelson, 1972

BS275 Business Forecasting
Prerequisite, SM145 Quantitative Analysis for Business
This unit introduces various forecasting techniques and their appropriate areas of applicability, together with some experience in the application of these techniques, via packages, to specific cases in the areas of production and inventory control as well as manpower planning.
Topics include: time series analysis and projection methods, input-output analysis, Markov models for manpower planning control and multiple regression models.
References
Firth, M. Forecasting Methods in Business and Management. Londo., Arnold, 1977
Brown, R.G. Statistical Forecasting For Inventory Control. N.Y., McGraw-Hill, 1959
Robinson, J.S. Planning and Forecasting Techniques. Londo., Weidenfeld and Nicolson, 1972
BS276  Computer Programming
Prerequisite BS121 Introduction to Data Processing

This unit gives students a broad understanding of programming techniques and languages and extends the knowledge of the fundamentals of program flowcharting, high level language coding and basic computer concepts which were introduced in the prerequisite unit.

While ANS COBOL language facilities are covered in some depth, and solutions to the major programming assignments are written using COBOL; other industry accepted commercial languages are also examined and compared. These include BASIC, RPG11 and PL/I.

The following topics are covered:

Language features. Form of the language, program layout, data types, arithmetic instructions, input and output instructions, conditional and loop instructions, editing and data manipulation.

Program development techniques. The stages leading from the system specification to the coding activity. Problem analysis. Programming aids e.g. pseudocode and flowcharting. Documentation. Program structure. Program design for implementation and maintenance. Program testing and debugging.

Major programming assignments approach realistic commercial complexity, and include the areas of: group reporting, table-handling, sequential file-updating.

References

BS281  Administrative Studies 2
(Human Behaviour in Organisations)
Prerequisite, BS132 Administrative Studies 1

This one-semester unit is primarily concerned with work problems related to or arising from human behaviour in business organisations. The teaching method will be based on a combination of lecturers, case-studies and class discussions. Where appropriate, structured experiences will be employed to facilitate the learning of theoretical concepts.

Topics include:

- personality theory; values and values classification; learning, perception, motivation; role theory; group dynamics and interaction theory; interpersonal communications and perception; conflict and conflict management; change and the resistance to change; the effects of organisation structures on human behaviour; organisation development (OD)

References
Leavitt, J.H. Managerial Psychology. 3rd edn, Chicago, University of Chicago Press, 1972

BS282  Administrative Studies 2
(Secretarial Administration)

This one-semester unit provides potential private secretaries with an understanding of:

(i) The nature, objectives and characteristics of the business organisation and its environment;
(ii) The functional activities of, and problems associated with, the general, financial, personnel, production, marketing and data processing managers and the company secretary.

The teaching method will be based on a combination of lectures, case-studies, tutorial papers and class discussions. Particular attention will be given to the duties of a secretary in each of the above areas.

Recommended reading

BS291  Private Secretarial Practice B
Prerequisite, BS191 Private Secretarial Practice A

A second year subject in which more advanced practical applications of the stenographic skills will be made. Shorthand and typewriting speeds of 110/55 respectively will be required for a pass, together with corresponding stenography ability.

Assignments given on secretarial knowledge and duties.

Textbook
Complete booklist available upon enrolment

AT295  Business Communications
Prerequisite, nil.

An annual unit designed principally for students of Private Secretarial Practice, to assist them in the preparation of letters, memos and other business documents; to improve their knowledge and understanding of the English language; and to facilitate generally, communications between persons or groups within the business structure.

Textbooks
Lists available on enrolment.

Degree units

BS301  Financial Management

Students enrolled in this unit will be expected to have passed BS261 Corporate Accounting.

This unit deals with the analytical methods and techniques required to assess a company’s performance. The interpretation of the analytical data to assess a firm’s long-term financial strength; profitability and intrinsic value of share capital form a major part of the unit.
Various budgets and projected funds statements are used to show the inter-relationship between the specific topics considered, which include the choice between debt and equity capital, dividend policy, and working capital management. Receivables policy, cash management, investment opportunities in the short-term money market and long-term capital, dividend policy, and working capital management are considered, which include the choice between debt and equity.

Discounted cash flow methods compared to other techniques of evaluating fixed asset acquisitions are covered, together with a financial analysis of take-over proposals.

Students are required to submit a major case-study and/or regular seminar presentations.

Textbook

References

BS303 Advanced Accounting Theory

A general framework of theory is developed at the beginning of the unit including a study of the development of accounting objectives and standards, accounting methodology, asset valuation and income theory. This general framework is then used to evaluate specific topics including accounting for changing prices, accounting for long term financial leases, human resource accounting, tax effect accounting, depreciation and allocation theory.

Textbooks

References
Hendriksen, E.S. Accounting Theory. 3rd edn, Homewood, Ill., Richard D. Irwin, 1977
Parker, R.H. and Harcourt, G.C. eds Readings in the Concept and Measurement of Income. Cambridge University Press, 1969

BS304 Auditing

Students enrolled in this unit will be expected to have passed BS201 Corporate Accounting

This unit deals with both the theoretical and practical aspects of auditing. The object is to provide the student with an understanding of a rigorously defined conceptual framework, against which the entire audit process may be evaluated. The conceptual framework postulated, relates to the satisfaction of empirically determined user needs in the context of a structured scientific method.

The issue of user needs is a recurrent theme throughout the course, as is the issue of intersubjectivity or repeatability whereby the audit process may be made objective. Emphasis is given to the distinction between the descriptive (what is), and the normative/prescriptive (what should be), whereby current audit practice may be described and evaluated against the conceptual model.

Theoretical aspects of auditing are initially presented in lectures, whereas the practical aspects are dealt with wholly in tutorials. It must be stressed that although the lecture topics are detailed below are listed as discrete topics, the approach taken in lectures, highlights and emphasises the necessary interrelationships between these topics. Similarly tutorials are used to provide the link between the theoretical and practical aspects of auditing. Consequently, tutorials reinforce the theoretical issues initially raised in lectures, as well as providing a medium for a study of the concepts, objectives and methodology involved in the detailed interim and final audit procedures.

References
Harvard Business Review. Finance Series
Harvard Business Review, Capital Investment Series
Theoretical topics studied include auditing methodology and the formulation of auditing standards; audit independence; audit evidence; the rights, duties and legal liability of auditors; the audit report and the concept of truth and fairness; internal control; judgement, classical and Bayesian approaches to the sufficiency of audit evidence; computer audits; internal and management audits and materiality.

References
Robertson, J.C. Auditing. Rev. edn, Dallas, Business Publications, 1979
CCH Australia Limited, Victorian Companies Act & Regulations, latest edition

BS306 Taxation
Students enrolled in this unit will be expected to have passed BS201 Corporate Accounting.
This unit involves a study of Australian income tax law and practice with particular attention given to its significance in business decision-making. Topics to be covered will be the nature of assessable income, allowable deductions and the provisions relating to companies, partnerships, trusts, primary producers and international taxation agreements.

Preliminary reading

BS308 Advanced Company Law
Students enrolled in this unit will be expected to have passed BS207 Law of Business Organisations.
This unit is concerned with the study of various contemporary issues in company law, especially relevant for students in the accounting stream contemplating public practice. The course examines current topics in such areas as the constitutional and jurisdictional framework of company law, company direction and management, company conflict, company misfeasance, company finance and company takeover activity.

Prescribed texts
Companies Act, 1980 (Cwth.)
Companies (Acquisition of Shares) Act., 1980 (Cwth.)

References
Afterman, A.B. and Baxt, R. Cases and Materials on Corporations and Associations. 3rd edn, Syd., Butterworths, 1980

Detailed references to journal articles will be given to participating students.

BS309 Law of International Trade
Students enrolled in this unit will be expected to have passed BS206 Contract Law.

The purpose of this unit is to consider the legal aspects of international trade emphasising the following topics:
(a) international contracts of sale of goods, including a study of trade terms, performance of the contract, acceptance and rejection of goods, and the rights of unpaid seller and buyer.
(b) the proper law of a contract and jurisdiction to determine disputes.
(c) financing and insurance involved in export sales
(d) the role of tariffs and protection policies
(e) producer and commodity agreements
(f) methods of transportation and distribution of goods and the legal principles relating thereto
(g) comparison of the role of developing and developed countries with respect to international trade.

References
Greig, D. International Law. Sydney, Butterworths, 1976
Purvis, R. and Darvas, R. The Law and Practice of Commercial Letters of Credit, Shipping Documents and Termination of Disputes in International Trade. Sydney, Butterworths, 1975
Sykes, E. and Pyles, M. International and Interstate Conflict of Laws. Sydney, Butterworths, 1975

References
Afterman, A.B. and Baxt, R. Cases and Materials on Corporations and Associations. 3rd edn, Sydney, Butterworths, 1980
Purvis, N. Corporate Crime. Sydney, Butterworths, 1979

Detailed references to journal articles will be given to participating students.
BS310  **Budgeting**  
Students enrolled for this unit will be expected to have passed BS210 Management and Cost Accounting and BS301 Financial Management or alternatively be currently enrolled for BS301  
This is a final year unit designed to develop and integrate the planning, control and decision-making techniques and skills introduced in management and cost accounting and financial management.  
The unit will also draw on the areas of operations research, economics and marketing. The course will include a study of the objectives of budgeting and the behavioural implications of alternative approaches to budget formulation. Both the operating and financial budgets will be studied in detail with emphasis on the inter-relationships and inter-dependencies between the various components. Techniques such as financial modelling, simulation, cost-volume-profit analysis, discounted cash-flow analysis, standard costing and a number of optimisation models will be studied in the context of their uses as aids to budgetary planning.  
The implications of alternative cost and financial structures for risk and return on investment.  
Budgeting problems during times of rapidly changing prices  
The zero-base approach to budget formulation.  
The use of network analysis and critical path methods for planning and control.  
Program budgeting — its nature and application  
Budgetary planning and control in non-manufacturing and non-profit organisations.  

**References**  

BS311  **Public Finance**  
Prerequisite, BS111 Economics 1  
This unit involves an analysis of the economic rationale of government expenditure and revenue raising. It will cover the following topics:  
(1) an introduction to welfare economics and its implications for government economic policy  
(2) taxation analysis: criteria for evaluating taxes and tax systems; analysis of personal and corporate income tax with particular emphasis on the tax unit, the tax base and tax rates; analysis of present sales tax and excise tax arrangements and alternatives to these forms of consumption taxes. Schemes to reform the Australian tax system  
(3) techniques to analyse the provision of goods and services by the government sector with particular emphasis on cost benefit analysis as a means of evaluating government expenditure programs.  

**References**  

BS312  **Economic Research**  
Prerequisites, BS211 Managerial Economic Analysis or BS213 Industry and Government  
This unit broadens the students' familiarity with the nature and scope of research undertaken in economics, and to increase students' ability to analyse and carry out economic research of a practical nature.  
Topics include: methodology in economic research; data sources; collection, analysis and presentation of data; selected topics in applied economic research (economic model building, cost benefit analysis, industry studies, aspects of industrial relations).  

**References**  
There is no single prescribed reference for this course. Extensive use will be made of current journal articles. A detailed list of references will be made available during the course.  

BS315  **Monetary Economics**  
Prerequisite, BS111 Economics 1  
This unit provides a study of the nature of and developments in Australian finance markets and considers various aspects of monetary theory and policy. The topics to be studied include:  
(1) Finance markets: nature and role of finance: economic development and financial development; evaluating the performance of finance markets; short-term money markets — official, buy back, commercial bill, and inter-company loan; capital markets — primary and secondary; rigidities and distortions in the finance markets; the question of controls  
(2) Monetary theory; classical, Keynesian, neo-Keynesian and modern quality theories of the relationship between money and output, employment and prices  
(3) Monetary policy: choice of policy instrument; rules and discretion; strength of monetary policy; monetary policy in Australia.  

**References**  

BS317  **Labour Economics**  
Prerequisite, BS111 Economics 1  
Although second year economics is not formally required, students are advised to complete either BS211 Managerial Economic Analysis or BS213 Industry and Government before attempting this course of study.  
This unit emphasises contemporary problems in the Australian labour market. Topics to be covered include:  
The role of labour in industrial society; factors determining the supply of and demand for labour; wage determination including the role of wages in the prevailing environment of inflation and unemployment (including an examination of policy initiatives such as indexation and prices and incomes
control); inequality and discrimination in the labour market; policy measures to deal with the growing structural problems in the Australian labour market, for example, manpower planning.

References

**BS318 Urban Economics**
Prerequisite. BS111 Economics 1

In this unit, students develop an analytical approach to appraising urban problems and policies. While the emphasis is on economic analysis, part of the course is devoted to discussing sociological and town planning perspectives of urban problems. This recognises that urban problems are multi-faceted, demanding a multi-disciplinary approach. The unit covers the following broad areas: economic analysis and urban problems, urban location decisions, decentralisation, government and private roles in urban development, public policy and urban problems with particular reference to transport, real estate and the environment.

References

**BS319 International Economics**
Prerequisite. BS111 Economics 1

This unit provides a study of international trade, and finance with special reference to Australia. Topics covered include: the nature of foreign exchange markets and the determination of exchange rates; balance of payments adjustment mechanisms; internal and external policy mixes — Australian policy aspects; international financial arrangements — historical developments, and current issues; the basis of international trade and the determination of trade patterns; trade restrictions; alternative approaches to industry development; Australia's industry assistance policies — current debate; international investment; international development issues e.g. economic integration, a new international economic order.

References
Industries Assistance Commission Annual Report, Canberra, AGPS
Kasper, W. and Parry, T.G. Growth, Trade and Structural Change in an Open Australian Economy. Kensington, Centre for Applied Economic Research, University of N.S.W., 1978

**BS324 Management Information Systems**
Prerequisite. BS327 Systems Design B

This unit develops an awareness of the scope and the problems associated with computerised management information systems. As this is the final systems unit, it builds extensively on material taught in previous units. The theory is developed using practical assignments and seminars where appropriate.

Topics covered:
- Theories of information including quality, uses, sub-systems, information requirements by levels of management, effect of computers on the flow of information, the data administrator.
- Project planning, selection, justification, phasing and evaluation.
- Selection and justification of resources and methods to be used including hardware, software, packages, distributed systems, suppliers, consultants, software houses and bureaux, data processing staff.

The design process, design as an iterative and a creative process, checking of stages against objectives, re-evaluation of design.

The implementation process, impact of new techniques on planning, trial runs, file creation systems, degraded operation.

Management and information systems, distinguishing the roles of management and data processing staff, education and training, management involvement and influence.

Information systems failures, symptoms, causes, responsibilities of users.

Social implications of using computers, privacy, security and control.

Future developments in the industry.

References
A detailed reading guide is issued for each topic, however, general references include:

**BS327 Systems Design B**
Prerequisite. BS227 Systems Design A or BS224 Commercial Application Packages

Data base and data communications techniques are now established as the means by which the rapid growth demanded of the data processing industry in the foreseeable future, may be achieved.

Students successfully completing this unit will be able to:
- Identify the symptoms of isolated application development, and state the benefits which application integration, via a data base approach, can realise.
- Demonstrate the importance of data independence, data structuring, and data base administration in achieving the objectives of data base.
- Compare broad features and merits of DL/I, CODASYL and Relational Data Base Management Systems.

Design simple data bases using the techniques of data analysis and normalisation.
Classify on-line applications into their classical types, and identify the purpose of and benefits derivable from such application types.

Use the terminology of data communications to describe data flow through the hardware components of typical on-line system configurations, including distributed systems.

Match the requirements of an on-line application to characteristics of available terminal types, including intelligent terminals.

State how typical functions of modern data communications software packages can improve the productivity of on-line application developers, and end users.

List the decision steps involved in on-line system design, and be able to apply certain design calculations (such as queuing theory) and human factors decisions (such as screen design) to a simple on-line application.

References

Relevant material includes a wide range of texts and journals which will be discussed during each lecture. However, two general references and suggested prereading are:


Bingham, J.E. and Davies, G.W.P. Planning for Data Communications. Lond., Macmillan, 1977

BS328 Information Systems Analysis

Prerequisite. BS121 Introduction to Data Processing. BS210 Management and Cost Accounting must have been attempted.

The intention is to develop an awareness of the suitability of systems analysis as a means of integrating a number of skills for problem-solving purposes. The principal emphasis will be towards commercial data processing applications, although the technique should be appreciated for its broader applicability. The approach will be directed to identifying and defining problems rather than specifying equipment solutions.

Topics covered:

The system approach including objectives and the life cycle of systems. Investigating systems, techniques of fact finding, analysis and presentation.

Logical systems, design for man/machine interface, evaluation and determination of reports, input determination and strategies for data encoding capture, information specification and flow.

Systems control, the need for accuracy, security and the stages of control.

Resources, provision of data processing services.

Project evaluation, feasibility study, economic evaluation, estimating techniques.

Implementation, education of staff, change-over methods, project control and evaluation.

Documentation through all phases of the systems life cycle

The theory is developed using practical assignments and case studies of an investigational nature.

References

A detailed reading guide is issued for each topic, however, general references include:


Cushing, B.E. Accounting Information Systems and Business Organisations. California, Addison-Wesley 1978


BS329 Systems Software A

Prerequisite. BS226 Commercial Programming B

This unit provides a practical programming basis for the examination of systems software principles and components, such as operating systems, in the unit Systems Software B.

The topics include:

1. An overview of systems software

What is systems software — examples; limitations of applications programming.

The need for special language attributes — flexible manipulation and definition of data types, table (list) processing, string functions, inter-program communication.

The need for special techniques — fundamental nature of data structures, dynamic coding, concept of algorithms.

2. Systems software languages

Examples: one or more of the following high-level languages will be examined from a systems programming point of view.

BASIC-PLUS, PASCAL, PL/1, LISP

Examples: low-level languages.

Machine instructions, assembler, macro language, I/O programming — file/device handling, data communications, channel programming.

3. Systems programming techniques

Data structures

List processing — stacks, queues and dequesues, and their representation in sequential and linked storage.

Other structures — trees, digraphs.

Applications — the control of processes; physical file and data base structures.

The dynamic coding environment

The problems — example situations: real-time systems and general multi-programming.

Coding techniques — re-entrant, re-usable, refreshable (and recursive) coding.

Resource sharing — general inter-program communications, double update, deadlock.

Common algorithms, including:

Compaction, encoding, sorting, searching.

In addition, several practical programming projects are undertaken.

References

No prescribed texts. References will be announced during lectures.

BS330 Systems Software B

Prerequisite. BS320 Systems Software A

Productivity of systems designers and programmers is improved by an ability to exploit the facilities offered by the systems software, implemented on the computer system with which they are involved. This unit examines the purpose, structure and application of some important system software components, notably operating systems. Students successfully completing this unit should readily adapt to the characteristics and requirements of most commercial operating systems.
A selection of the following topics is covered:

**Computer hardware architecture**

The hardware, conceptual flow of control and data in an idealised machine, the location of intelligence, the concept of computer power, comparisons of different manufacturer's architectures and trends in computer hardware.

**Systems software**

Language translators, operating systems, data base and data communications management systems, utilities and programming aids.

**Operating systems**

Resource scheduling, multiprogramming, virtual storage, multiprocessing, job control languages, operations and a comparative study of a number of operating systems.

**Technical system management**

The systems programmer, system performance monitoring and tuning, managing system failures and job accounting.

**References**

Reading guides will be issued by the lecturers.

**BS331 Organisational Behaviour**

Prerequisite, BS132 Administrative Studies 1

A third year subject in the degree course in business.

One of the principle objectives is to help prepare students for their entry into organisational life, or in the case of part-time studies to allow them to understand their organisational environment better. This is achieved through a detailed study of the psycho-social subsystem of organisations via the use of experiential activities, and the analysis of case studies and films. Students gain an insight into the behaviour of people as individuals and group members within the organisational context and as an important by-product, learn something about themselves.

**Recommended reading**


Kogakusha, 1979

Webber, R.A. *Management*. Homewood, Irwin, 1975


**Textbooks**


**BS332 Business Cases**

This unit is concerned with how business and non-business organisations establish and carry out long-term objectives, strategies and plans in a changing environment.

There is strong emphasis on case work through syndicates, leading to the achievement of three objectives:

- To give students an opportunity to inter-relate the various disciplines in which they will have acquired some expertise by this stage of their studies.
- To give students an overview of the business entity.

To give students the opportunity to develop and practise their analytical and communications skills with particular reference to the business environment.

**Recommended reading**


**References**


**BS333 Marketing 3**

Prerequisite, BS232 Marketing 2

The object of this unit is to generate skills and experience in the implementation of marketing plans.

Topics include:

- Sales and sales management — the how and why of personal selling. The sales management function. Territory management.
- Product/brand management — packaging and branding.
- Product policy. Strategic marketing.

**Industrial marketing**

Services marketing. International marketing.

**Social responsibility in marketing.**

**References**


**BS334 Industrial and Legal Aspects of Marketing**

Prerequisites, BS333 Marketing 3, BS234 Marketing and the Law

This subject teaches students the various aspects of the marketing function in industrial companies and the law as it applies to industrial marketing.

The content of the subject is organised into the following sections

1. The industrial market
   - Nature and importance of industrial markets;
   - Classification of industrial products: Characteristics and determinants of industrial market demand, (end-use analysis)

2. Industrial buyer behaviour
   - Customer classification; The buying process in industrial companies; Buying motivation; economic, behavioural and organisational factors; Differences in industrial and consumer buying

3. Market selection and product planning
   - Special aspects of pricing and distribution policies; Relationship of the industrial marketer with his consumers; The effect of government regulations on importing and exporting goods and services; The effect of government regulations and the law on:
     - (i) packaging and labelling for marketing
     - (ii) using registered designs and trade marks in the marketing function
     - (iii) marketing defective products

**References**


*Packaging and Labelling Law in Australia*. Report by the T.P.C. June, 1977


**BS343 Operations Research Methods**

Prerequisite: BS241 Fundamentals of Operations Research or equivalent

This unit introduces students to a broader range of quantitative methods for the solution of day to day business and economic problems. The computer will be used to help solve many of the case problems presented throughout the course via FORTRAN or BASIC packages and/or programs written by students.

Emphasis will be placed on problem recognition and formulation and full interpretation of solutions.

Topics covered will include: elementary FORTRAN or BASIC and the use of computer packages; Markov analysis applied to capital equipment purchase, accounting control and market research models; Queueing theory and its uses in the industrial and business context, including a consideration of information processing problems; replacement and renewal theory relating to capital expenditure analysis. Manpower planning models will also be considered based on Markovian and non-Markovian principles.

Elementary dynamic programming will be introduced and applied to inventory and financial problems.

Case studies and assignments will be an integral part of the course and will be evaluated as part of the overall assessment in the unit.

References

A detailed list of texts and journals will be made available during the course.

**BS344 Simulation**

Prerequisites, BS343 Operations Research Methods and preferably one of BS301 Financial Management, BS311 Public Finance, BS312 Economics Research or BS326 Operating Systems usually should have been passed before this unit is attempted.

This unit develops some of the analytical techniques appropriate to solving business problems that are quantifiable by conventional mathematical methods.

Teaching will be mainly by practical work, students being required to complete a number of small cases, using the ICL4/50 and PDP 11 simulation facilities.

During the first four sessions theory, fundamentals to simulation, will be introduced. This will include the examination of systems from the viewpoint of their components and the logical interactions. It will then go on to establish the techniques of using random numbers as a basis for creating systems models in conjunction with simple mathematical and logical programming.

The choice of cases will be fairly wide and appropriate to an individual’s specific interests. Applications that could be drawn on will include:

- Financial evaluation of alternative investments and their associated risk; inventory modelling; marketing programs; computer operations systems evaluation; corporate modelling; economic modelling; evaluation of transport systems; evaluation of social systems.

- During the cases, any additional theory e.g. validation techniques, appropriate to the unit will be covered in its practical context.

**BS345 Quantitative Cases**

Prerequisites, BS242 Linear Programming and BS343 Operations Research Methods

The unit enables students to employ a multi-technique approach to problem-solving. As such it will provide them with the opportunity to fully integrate and apply their knowledge acquired in previous units. The unit will be based on three or four major case studies and is designed as a final unit for those students taking quantitative methods as a major area of study in their degree course.

Extensive use will be made of the FOBOL library and computer facilities for problem-solving.

References

A detailed list of references will be made available throughout the unit.

**Diploma subjects**

**BS351 Accounting 3A — Contemporary Accounting Problems**

Students enrolled in this unit will be expected to have passed BS251 Accounting 2A

This unit examines the problems associated with measuring the performance of business entities. Topics to be covered include a study of the objectives of accounting, accounting methodology and the formulation of accounting standards; asset valuation; concepts of depreciation and the allocation problem; accounting for long-term leases, human resources and income tax allocation. The latter part of the unit examines the concept of income and alternative methods of measuring income in periods of changing prices.

Preliminary reading


Textbooks


References

- Barton, A.D. *An Analysis of Business Income Concepts*. Lancaster, University of Lancaster, International Centre for Research in Accounting, 1975

**References**

- I.C.L. *System 4 C.S.L. Manual*

Journal articles and other references will be given during the course.

**Faculty of Business**
Hendrikse, E.S. Accounting Theory. 3rd edn. Homewood, Ill., Irwin, 1977
Sterling, R.R. ed. Research Methodology in Accounting. Lawrence, Kansas, Scholars Book Co., 1972

BS352 Accounting 3A — Analysis and Interpretation

Students enrolled in this unit will be expected to have passed BS251 Accounting 2A

Students are introduced to the various analytical methods and techniques used in analysing a company's financial statements. This involves a major study concerned with logical interpretation of analytical data and ratio analysis for assessing a firm's profitability, working capital management, long-term financial strength and intrinsic value of its share capital.

Topic coverage also includes the critical appraisal of working capital requirements, short and long-term financing methods, cash management and receivables policies, together with a detailed evaluation of take-over proposals. Further considerations such as dividend policies, investment opportunities and cash flow analysis are also introduced.

Textbook

References

BS353 Accounting 3B — Capital Budgeting

Students enrolled in this unit will be expected to have passed BS252 Accounting 2B

Different types of capital investment proposals are analysed and the necessity for a program to administer and review capital expenditures is examined in the light of the goals of the firm. Evaluation techniques such as the rate of return, payback period and discounted cash flow measures are considered assuming a state of certainty to exist. Further considerations such as taxation, inflation, the rate of interest, depreciation, abandonment, and budgeting techniques are introduced to the analysis.

Measures to allow for risk analysis in capital investment are considered so that the evaluation techniques can be applied under conditions of uncertainty. The importance of qualitative factors in investment decisions is stressed throughout.

Preliminary reading
Middleton, K.A. The Economics of Capital Expenditure. 4th edn, Butterworths, 1977

References

Harvard Business Review Reprints, Capital Investment Series, Finance Series
National Association of Accountants, Accounting Practice Report No. 7. The Capital Expenditure Control Program

BS354 Accounting 3B — Advanced Cost Accounting

This unit expands concepts, introduced in Accounting 2B (BS252), in the areas of management planning, control and decision-making.

Topics covered include the measurement of divisional and managerial performance with emphasis on problems associated with the allocation of common costs and transfer pricing; applications of variance analysis in analysing profit performance; tailor-making cost data for specific managerial decisions, problem areas in product costing; cost control techniques in non-manufacturing areas; consideration of recent developments in manufacturing cost control; critical assessment of inventory control techniques currently available to management which leads to the development of appropriate decision models, a study of their application and problems of implementation.

References
NAA Research Report No. 40. Techniques in Inventory Management
Rosen, L.S. Topics in Managerial Accounting. 2nd edn, Toronto, McGraw-Hill Ryerson, 1974
Solomon, D. Divisional Performance Measurement and Control. Homewood, Ill., Irwin, 1965
Thomas, W.E. ed. Readings in Cost Accounting Budgeting and Control. 4th edn, Cincinnati, Ohio, South-Western, 1973

BS355 Accounting 3C — Auditing

Students enrolled in this unit will be expected to have passed BS251 Accounting 2A

The unit deals with both the theoretical and practical aspects of auditing. The objective is to provide the student with an understanding of a conceptual framework against which the audit process may be judged, and by which user needs (shareholders and other interested parties) may best be served.

The primary emphasis of the course is an examination of the auditor's decision-making process. The assumption being that, if students understand the objectives to be accomplished in a given audit area, the circumstances of the engagement, and the decisions to be made, they should be able to determine the appropriate evidence to be gathered and how to evaluate the evidence thus obtained.
Topics to be studied will include the nature of an audit; the rights, duties and legal liability of auditors, audit methodology, internal control, evidence, sampling, materiality, the audit report, independence, auditing and EDP, internal and management audits, as well as the more practical aspects of audit program applications.

References

**BS356  Accounting 3C — Taxation Law**

Students enrolled in this unit will be expected to have passed BS251 Accounting 2A.

This unit consists of an analysis of income tax law in Australia. Topics to be studied include assessable income, taxable income and allowable deductions, and the special provisions relating to companies, partnerships and trusts.

References

**BS367  Economic Policy**

Prerequisite, BS261 Economics 2

The purpose of the subject is to examine and analyse contemporary economic policy issues relevant to the Australian economy.

Towards this aim the topics covered are determined by Australian current economic conditions and policy considerations. Topics are selected from among the following areas: policies designed to combat the problems of inflation and unemployment; industrial relations policy issues; industry policies (intersector relationships, protection, structural change); balance of payments problems and policies; current social economic issues (including poverty) and policy implications.

References
Because of the contemporary nature of this course, details of references are provided at the first class. Students are expected to consult newspapers, current journals and selected government reports.

**BS378  Business Systems**

Prerequisites, BS251 Accounting 2A or BS252 Accounting 2B

Course objectives

1. The student will understand the nature of a business system and the manner in which business systems can be best developed and maintained.

2. The student will be able to follow through the development of a system from the point of determining system requirements through to successful implementation.

3. The student will understand the processing alternatives available and the advantages and disadvantages of each.

Topics include:

- the nature of a business system; selecting systems for development; steps in system design; flowcharting techniques; decision tables; form design; code design; system controls; system documentation; evaluating processing alternatives; implementation procedures.

References

**BS381  Behaviour in Organisations**

Prerequisite, Administrative Studies 1

The object is to provide an in-depth reinforcement and expansion of behavioural concepts presented in Administration Studies 1, with special emphasis on group experience.

This unit is concerned with administrative problems related to or arising from human behaviour in various forms of business organisation. An experimental emphasis is given to the mastery of concepts by the use of structured experiences, case studies and discussion. This is complemented by assignments, films, excursions and the presentation of papers.

Main topics include:

- The psychological contract and organisational socialisation; motivation and organisational climate; the technological system and its impact on the psycho-social system; interpersonal perception; interaction theory and group dynamics; value systems and their implications for management; communication systems; managerial styles; organisational structural effects on human behaviour; problems and techniques of organisation change and conflict management.

Textbook

References
BS383 Marketing

Prerequisite, BS261 Economics 2

The object is to enable students to understand the marketing environment and to recognise the importance of the marketing function in both business and non-business organisations.

This unit is concerned with the fundamentals of marketing, marketing planning, marketing information and marketing research. Emphasis is shared between theoretical considerations and practical problems. Throughout the course students are expected to participate actively through the use of case studies and the presentation of group and individual assignments.

Main topics include:

(i) The marketing concept and scope of marketing management
(ii) The marketing planning process
(iii) Consumer behaviour, consumption and expenditure patterns, the buying process and market segmentation
(iv) The marketing mix: product, price, promotion and distribution — the practical issues
(v) Marketing research: problem definition, research strategy, survey methods, sampling
(vi) Introduction to marketing strategy.

References
McCarthy, E.J. Basic Marketing. 4th edn, Homewood, Irwin, 1971

BS384 Law of Business Entities

Students usually should be enrolled in or have passed BS251 Accounting 2A when undertaking this unit.

The intention is to undertake a comparative analysis of the form of business entities. Essentially this involves an analysis of corporations, partnerships, trusts and unincorporated associations.

References
Baxt, T. Introduction to Company Law. 1st edn, Law Book Co. Ltd., Syd., 1977
Partnership Act, 1958
Companies Act, 1961
Trustee Act, 1958

BS385 Legal Environment of Business

Prerequisite, BS255 Commercial Law

The aim is to analyse the impact of various statutes and statutory-created tribunals which impinge on the production and marketing functions of business.

Detailed consideration will be given to some or all of the statutes and tribunals relating to the employment of labour, the environmental impact of production and the marketing strategies of business.

References
As prescribed in lectures.

Graduate diploma subjects

BS457 Introduction to Financial Management

Prerequisites, nil

A first year subject in the graduate diploma course in business administration.

The general objective is to educate candidates to become informed and intelligent users of accounting information.

The course will be particularly concerned with how accounting information can help the firm achieve all its goals. One role of accounting is in the measurement of performance, and it is in this area that the strengths and limitations of accounting information will be discussed.

No prior knowledge of accounting is assumed.

Applicants who have previously studied accounting at a tertiary level or are working as accountants will be advised to enrol for one of the subjects from the graduate diploma in accounting.

Applicants who have studied accounting at a sub-tertiary level or who finished their courses some time ago will be enrolled in this subject.

Topics will include: the objectives of business organisations and a comparison with the objectives of an accounting system; costs for decision-making and specific techniques such as cost/volume/profit analysis and discounted cash flow analysis; accounting reports for performance evaluation and the assumptions that are implicit in their compilation; divisional performance evaluation and transfer pricing; budgeting and profit analysis;

References
Mathews, R.L. The Accounting Framework. 3rd edn, Melb., Cheshire, 1971

BS461 Economics

No prior knowledge of economics is assumed. Applicants who have majored in economics at a tertiary level will be advised to enrol for another post-diploma subject. Applicants who have studied economics at secondary level or who finished their courses some time ago will be enrolled in this subject.

Consideration is given to the factors that determine the general level of economic activity and those economic concepts and methods of analysis that bear directly on the management of a firm.

The topics to be covered are drawn from: markets, resource allocation and efficiency; demand; production and costs; pricing and profit; industry economics including public policy aspects; aggregate demand and supply analysis; money and economic activity; employment and unemployment; inflation; monetary, fiscal, balance of payments and prices/incomes policies.

References

A detailed reading guide will be issued at the start of the semester.
BS463 Current Issues in Economics
Prerequisite, approved tertiary studies in economics
The purpose is to examine and analyse important contemporary issues in economics with particular emphasis on economic policy implications.
Particular topics covered are determined by the contemporary situation but usually, are selected from the following areas:
- fluctuations in economic activity (unemployment and inflation); policies designed to offset undesirable fluctuations in economic activity; industrial relations; industry policies (inter-sector relationships, protection, structural change);
- balance of payments problems and policies (including exchange rate policies); current social economic issues (including poverty).
References
Because of the contemporary nature of this course, details of references will be provided at the first class. Students will be expected to consult newspapers, current journals, and selected government reports.

BS464 Australian Industrial Relations
This unit provides a study of the Australian industrial relations system with some comparative reference to the systems of other countries. Topics to be studied include:
1. nature and meaning of industrial relations and an industrial relations system
2. nature, sources and manifestations of industrial conflict
3. parties: Trade unions, employer associations and industrial tribunals
4. rule-making processes: arbitration, collective bargaining, productivity bargaining, worker participation schemes

References
Hyman, R. Strikes. Lond., Fontana, 1974

BS552 Financial Structures and Policy
Prerequisite, a pass or preclusion from BS457 Introduction to Financial Management
The general objective is to develop an understanding of financial theory so that the student can evaluate the firm’s investment, financing and dividend decisions in keeping with an objective of maximising shareholder wealth; together with providing students with the means of applying analytical techniques to solve a wide variety of problems involving financial decisions.
In particular, the topic coverage includes performance evaluation, working capital management, capital structure and leverage, fixed asset acquisition, dividend policy, valuation of the firm and business combinations.

Textbook


BS581 Administration of Organisational Systems
Prerequisite, no prior knowledge of administrative theory is assumed, but working experience in a business, public service, or any other form of organisation is essential
A unit in the graduate diploma course in business administration, or accounting.
This subject introduces the ‘body of thought’ about the problems of management, with special emphasis on the relationships between people and technology.
The learning experience depends largely on the involvement and experience of the students, who bring knowledge and skill to the task.
The lecturers’ role is to generate a situation in which current attitudes and practices are challenged, and alternative approaches to management are evaluated.

Theoretical models are applied to problems in order to permit impartial analysis of organisational issues.
Experience is also gained in co-operative group preparation of material and presentation to the class.
Theory is applied to real situations through assignments requiring the investigation of an organisation with which the student is familiar.
The value of theory as a means of expanding the range of a manager’s decisions and actions is the basis of this course.

Framework
1. The process of organisational socialisation, including concepts of role theory and the ‘psychological contract’ of reciprocal employer/employee expectations.
2. Organisational climate and its relationship with power, affiliation and achievement motivation of managers.
3. The evolution of management ethics and values. The protestant ethic, laissez-faire, social Darwinism. The social ethic, ethical pluralism, the relevance of these to current management practice.
4. Evolution of organisation and management theory.
5. Systems theory and organisations. An examination of the systems theory idea and its use as a tool of organisational analysis.
6. Behavioural aspects of decision-making
7. Technological systems and worker satisfaction.
8. Effective organisation structures

Recommended reading
BS582 Administration of Human Resources

Prerequisite. BS581 Administration of Organisational Systems

A unit in the graduate diploma course in business administration.

Structure

(1) The contribution of the behavioural sciences in solving the 'people' problems of management are studied so that the student will be better able to interpret psycho-social aspects of organisations, and better equipped for the successful management of people.

(2) The student will be acquainted with current ideas of organisation theorists concerning communication, decision-making behaviour and organisation development.

(3) The student will be able to use these concepts to plan and evaluate management of people.

(4) The development of skills in communication, assertiveness and self-knowledge are subsidiary aims.

After the course, the candidates will have developed increased awareness of human organisational problems and of the impact their personal behaviour has on others.

Class sessions will draw upon lecture-discussions, group experiential exercises, case-studies, tests, student presentations and films.

These will be complemented by extensive private reading and practical assignments out of class.

Topics include interpersonal communications, motivation, perception, leadership, teamwork, intragroup and intergroup processes, conflict management, organisation development. Seminars during the semester are an integral part of the course.

Textbook


Experiential Workbook (Essential Purchase)


BS583 Marketing Administration 1

Prerequisite, nil

Marketing Administration 1 and 2 deal with the fundamentals of business planning with particular emphasis on the market-place. The unit has been designed to provide accountants with an opportunity to relate their special skills to business situations.

Objectives

To give students a broad understanding of the marketing environment

To give students an overview of the total business function in particular with respect to planning and decision-making

To provide students with the means of analysing market information as required when evaluating capital expenditure proposals

To achieve the above objectives, emphasis is placed on case study analysis and other practical assignments.

Structure

Marketing Administration 1 introduces students to the role of marketing as part of the overall business function, and consists of a series of lectures dealing with the fundamentals of marketing, marketing planning and consumer behaviour.

Instruction

Emphasis will be shared between theoretical considerations and practical problems. Throughout the course students are expected to participate actively through the use of case studies and the presentation of group and individual assignments.

Framework

Introduction — the marketing concept, the scope of marketing management. The market and an analysis of demand.

Consumer behaviour, consumption and expenditure patterns, the buying process, market segmentation.

Product/service policy — life cycle and adoption process, planning, differentiation, packaging and branding.

Pricing policy — cost, demand, resources considerations, competition.

The communications mix — advertising, promotion, personal selling.

Distribution policy — channel selection, physical distribution

References


McCarthy, E.J. Basic Marketing. 4th edn, Homewood, Ill., Irwin, 1971


Simmonds, K. and Leighton, D. Case Problems in Marketing. 1st edn, Lond., Nelson, 1973

BS584 Marketing Administration 2

Prerequisite, BS583 Marketing Administration 1

This unit builds upon the knowledge that students have gained from Marketing Administration 1 especially in respect to the marketing planning process and the elements of the marketing mix. The aim of this unit is to:

(a) introduce the student to the fundamentals of marketing research

(b) identify the value of additional information and how this information can be used

(c) introduce the student to end-use analysis and also the various approaches to forecasting.

Instruction

Class sessions will be composed of lectures relating to theoretical concepts and to case study analysis. Students are expected to participate actively throughout the semester, and are required to present individual as well as group assignments.

References


**BS585 Secretarial Practice and Procedure**

This unit is intended to equip potential company secretaries for their role.

Topics covered include:

- Meetings and conferences, duties of chairman, organisation, standing orders, terms and expressions, etc.
- Board meetings: preparation, agenda and minutes, quorum, voting rights, powers of members' motions
- The Board and the Stock Market. Functions and procedures, listing requirements and terminology, voluntary and statutory controls, etc.

References

The reading list will be made available during the semester

**BS586 Personnel and General Administration**

A subject in the graduate diploma course in business — accounting.

Four sessions are spent on industrial relations. The remaining sessions cover the topics of personnel practices, the personnel function and some related aspects of general administration. These sessions consider the nature of good personnel practice and the scope of the personnel function. The role of the personnel department in organisations, both now, historically and in the future. The relationship between the functions of personnel management and the personnel function of management. The alternatives available for the proper conduct of the personnel function in small companies without a personnel manager.

Particular attention is paid to: job satisfaction and morale; manpower planning; employee benefits and services; recruitment, selection and induction; training; performance appraisal; salary and wage administration; management development; organisation development and human resource development and the ways these various aspects can be related into a comprehensive integrated system of personnel management.

References

- Pigors, P. and Myers, C.A. *Personnel Administration: A Point of View and a Method*. 7th edn, Tokyo, McGraw-Hill, 1973

**BS587 Business Policy**

Prerequisites. Because of the nature of this unit business policy is given, preferably in the final semester of the course. Candidates must have completed all of group A units and preferably two of the group B units before commencing this unit.

Course

To integrate the philosophies discussed in all other units. Students are required to incorporate behavioural, economic, financial and marketing concepts and demonstrate that they have a clearly defined understanding of administration. The unit provides an opportunity to improve capacity to identify, analyse and evaluate strategic business problems and opportunities.

Framework

(1) Introduction. Business policy as a field of study;
(2) The managing director's job. As organisation leader, personal leader, architect of corporate purpose;
(3) Determining corporate strategy. The concept of corporate strategy. The organisation and its environment. The company and its strategies. The company and its societal responsibilities;

References

- Texts include:

**BS588 Administrative Policy**

This unit provides students with understanding of the management problems involved in developing strategic policies for organisations in both the public and private sectors. The student will be concerned with the development of corporate objectives and the translation of these objectives into strategic plans. Cases drawn from both business and government are used as well as discussions of prepared readings to help students learn how to employ strategy in selecting appropriate administrative policies and in securing their effective implementation.

References

- Smith, R.G. *Corporations in Crisis*. Garden City, N.Y., Doubleday, 1966
BS589 Management, Organisations and People

This unit is taken in the course for the graduate diplomas in accounting and management systems.

The course provides a macro-view of organisations as open systems examining the interfaces and interactions of environment, tasks, technology, structure and people. It then focuses on the psycho-social subsystem, studying individual, interpersonal, group and inter-group processes within the organisational context. The role of the manager in each of these contexts is a recurring and integrating theme. In particular, wherever possible learning will be applied to the accounting and financial environments immediately relevant to students. They have the opportunity to contribute by sharing their current and past work experience as a source of material to enrich class activities. It is anticipated that experiential learning methods as well as lecture-discussion and case methods are employed.

Considerable supplementary reading is required outside class time.

Assessment is progressive and may include essays, class presentations and/or tests.

Topics will be chosen from: the nature of the organisation; the organisation as an open system; interactions between sub-systems and their implications for managers; organisation climate and effectiveness; organisation change and development; inter-group competition and cooperation; managing conflict; group dynamics and team building; group decision-making; synergy vs. groupthink; inter-personal processes and communication; the individual; leadership; motivation, behaviour change and modification; perception; learning; values; personality and individual differences; models of man — behavioural science views.

Students are continually encouraged to analyse newly-acquired knowledge to facilitate transfer to their own work situations.

References

BS591 Quantitative Methods in Accounting

Prerequisite. No formal prerequisites are required for this unit.

The unit introduces some of the more common quantitative techniques applicable in accounting and allied disciplines.

Topics covered are selected from the following, taking account of student background and interest:

Financial modelling and its role in planning and performance reporting. A range of systems is considered with specific use being made of the MAPS (Money and Profit Simulation) package.

The problems of decentralisation and transfer pricing decisions, with particular reference to the use of linear programming output.

Quantitative methods available for the planning, analysis and control of working capital.

Determination of replacement and renewal policies and their relationship to traditional capital expenditure analysis.

Case studies and assignments are an integral part of the course and are evaluated as part of the overall assessment in the unit.

References
Detailed reference lists are supplied throughout the course.

BS594 Quantitative Methods

No formal prerequisites are specified beyond a previous knowledge of basic mathematics.

This unit in the graduate diploma — administration course is designed to give students an understanding of the role of quantitative analysis in the decision-making process. The skills acquired are used in other units of the course as well as giving an appreciation of relatively new quantitative techniques with practical application. These include the use of package programs on computer terminals.

The topics included are: analysis and presentation of data; significance testing; decision theory; forecasting (with emphasis on short-term models); simple linear programming; inventory management; critical path planning.

Recommended reading

Textbooks
None specified. During the course, references and other material will be listed.

BS595 Marketing Management 1

Prerequisites, nil

The program introduces students to the role of marketing as part of the overall business function, and consists of a series of lectures dealing with the fundamentals of marketing, marketing planning and consumer behaviour.

Methods of instruction

Emphasis is shared between theoretical considerations and practical problems. Throughout the course students are expected to participate actively through the use of case studies and the presentation of group and individual assignments.

Course framework

Consumer behaviour — consumption and expenditure patterns, the buying process; market segmentation.

Product/service policy — life cycle and adoption process, planning; differentiation, packaging and branding. Pricing policy — cost, demand, resources considerations; competition. The communications mix — advertising; promotion; personal selling. Distribution policy — channel selection; physical distribution. Introduction to marketing strategy.

References

BS596 Marketing Management 2

Prerequisites, BS583 Marketing Management 1 BS495 Quantitative Methods BS416 Economics

This unit builds upon the knowledge that students have gained from Marketing Management 1, especially in respect to the marketing concept, the marketing planning process and the elements of the marketing mix.

The aim of this unit is to:

(a) introduce the student to the fundamentals of marketing research

(b) identify the value of additional information and how this information can be used

(c) introduce the student to end-use analysis and also the various approaches to forecasting

(d) examine the alternative approaches to organising marketing activities
(e) involve the student in practical issues through the use of case studies, assignments and group presentations.

Method of instruction
Particular emphasis is placed upon the use of case studies to complement the lecture material. Students are expected to participate actively throughout the semester, and are required to present both individual as well as group assignments.

Course framework
The main topics include:
(a) The role of marketing within the objectives and constraints of corporate strategy.
(b) Forecasting — costs and benefits, demand determinants, predicting trends, simulation models.
(c) Marketing research — costs and benefits, marketing research strategy, evaluation of results.
(d) Test marketing — purpose of test marketing, the practical problems, applicability of Bayes theorem.
(e) Organising for marketing — implications of the environment, relationship with total organisation, basic organisational types.

References

BS651 Current Issues in Accounting

The unit covers current issues relevant to the accountant involving a study of exposure drafts, suggested reforms and theories, changes in government regulations and practices, developments in international and domestic public and private enterprise.

References
Detailed each year by the lecturer in charge

BS652 Profit Planning and Control

Prerequisites, nil

A unit in group A of the graduate diploma in accounting, which is concerned with analytically developing profit plans for a business enterprise and the control of the resources invested in the enterprise.

Topics covered include:
profit planning both short-term and long-term; stages of evaluation, strategy, planning and reporting operations; controllership functions and responsibilities — control of assets, liabilities, income and expenses; control techniques

References
Anthony, R.N. *Planning and Control System*. Graduate School of Business Administration, Boston, Harvard University, 1965
Irwin, P.H. *Business Planning — Key to Profit Growth*. Hamilton, Ont., SIA Canada, 1969

BS653 Auditing and EDP

Prerequisites, Auditing or Accounting 3C/Auditing and Introduction to Data Processing, or suitable equivalents

The increasing dependence of all types of organisations on computer-based systems has brought about a need for new approaches to auditing. In this unit it is intended to acquaint people with some auditing computerised systems.

Topics covered include:
revision of basic data processing principles; the audit role in systems development; the design functions and development of controls; processing and program controls; the computer audit trail; auditing packages; appraisal of control requirements in the various processing options e.g. bureaux, time-sharing etc.; auditing advanced systems e.g. on-line systems, data base etc.; internal control questionnaire for EDP.

The teaching method will be by lectures, seminars and practical case work. A major case study will be undertaken.

References
Specific articles and texts will be referred to when completing each topic area.

BS654 Contemporary Auditing

Prerequisite, BS355 Accounting 3C — Auditing or equivalent

It is essential that students are familiar with the subject matter of BS355 Accounting 3C Auditing or BS304 Auditing as most seminars will include an examination in-depth of issues initially raised at the undergraduate level. The aim is to evaluate in a series of seminars, some of the more important contemporary issues facing the profession. This unit is most beneficial to students who have had some auditing experience.

Seminar topics are chosen from the following:

- an analysis of the attempts to postulate a conceptual framework of auditing, and the inherent problems and implications resulting from the promulgation of inductively determined standards that do not meet adequately the specific needs of the primary users of audited information.
- the importance of behavioural factors in auditing, with particular reference to Goldman and Barley's behavioural model of independence, and an analysis of empiric research into behavioural patterns in internal audit relationships.
- contemporary attempts to solve some of the traditional problems of internal control evaluation by the use of Bayesian probability and positional analysis.
- the implications for the role and responsibilities of the profession resulting from the deliberations of the Metcalf, Cohen, Adams and Moss Committees.
- contemporary developments in the law of negligence, with particular reference to the decision of the New Zealand Court of Appeal in the case of Scott Group Ltd v. McFarlane, the responsibility of the auditor in relation to 'post balance date events', with particular reference to the decision in *Corporate Affairs Commission v. A. and T. Barton*, the audit implications of current cost accounting.
- the epistemological implications of the traditional audit approaches to the collection and evaluation of evidence.
- the objectification of the materiality decision in auditing and accounting.
- the audit implications of computer-based accounting systems.
- the inherent problems of the concept of 'truth and fairness'
the responsibility of the auditor to detect fraud with particular reference to the Equity Funding Corporation case. an analysis of the ethics of the profession in the context of ethical theory.

the role of the auditor in the context of 'efficient markets' and portfolio theory.

the role of the auditor in relation to compliance with statute and the O.L.R. of the A.A.S.E.

forecasts in published accounts—the role of the auditor governmental auditing.

'social auditing'

References
Detailed reading guides are issued during the semester

BS655 Corporate Taxation
This unit involves a study of those aspects of taxation law relevant to corporations and their shareholders. The course studies income and deductions for the ongoing company; tax consequences of liquidations, mergers and reorganisations; relevant to corporations and their shareholders. The course

References
Australian Federal Tax Reporter, North Ryde, N.S.W., CCH Aust. Ltd
Taxation Aspects of Plant, Equipment and Buildings. North Ryde, N.S.W., CCH Aust. Ltd, 1974
Understanding the New Investment Allowance. North Ryde, N.S.W., CCH Aust. Ltd, 1976
Hodgins, J.E. Sales Tax in Australia. Sydney, Butterworths, 1976
Tax Essays Volume 1. Sydney, Butterworths, 1979

BS656 Taxation Planning
In this unit, the objectives and techniques of tax planning are studied.

Topics include a study of trusts, alienation of income, service entities, superannuation funds, contesting an income tax assessment, preventing the avoidance of income tax, and international tax planning.

References
Australian Income Tax Assessment Act 1936 as amended (Commonwealth)
Australian Federal Tax Reporter. North Ryde, N.S.W., CCH Aust. Ltd
Marks, B. Alienation of Income. North Ryde, N.S.W., CCH Aust. Ltd, 1978

BS658 Quantitative Approaches to Financial Policy
Prerequisite, usually students would have completed an introduction to linear programming and capital budgeting at undergraduate level.

The object is to examine the use of financial models as a means of overcoming the problem of conventional investment analysis.

Specifically the course includes an evaluation of conventional capital budgeting techniques with reference to multiple period investments, project interdependence, uncertainty and the inter-relationship between investment, financing and dividend decisions.

Modelling is studied as a solution to financial decision-making including the development of linear programming models and corporate models to take account of the above problems.

References
Detailed references are issued by lecturers.

BS659 Investment Analysis
BS451/651 Current Issues in Accounting usually should have been completed prior to attempting this unit.

The unit consists of two parts, security analysis and portfolio theory and practice.

Course content includes a review of types of, and markets for, securities; a consideration of techniques used by security analysts to assess and evaluate corporate financial performance; and a review of share valuation models. In the second part of the course, portfolio theory is developed and portfolio performance evaluated, together with consideration of current Australian practice.

Preliminary reading

References
Markowitz, H.M. Portfolio Selection. New Haven, Yale U.P., 1971

Textbook

BS672 Systems Analysis
Course objectives
The primary purpose of this unit is to develop an awareness of the suitability of systems analysis as a means of integrating a number of skills for problem-solving purposes.

After completing this unit, students should be able to:

determine user requirements for information;
document these requirements;
determine the appropriate level of systems controls;
specify alternative methods for solving the problem.

No prior systems knowledge is assumed, however students are strongly advised to undertake some preliminary reading.

Course structure
introduction to systems analysis; systems investigation and documentation; input and output design; systems controls; selection and evaluation of systems projects; equipment and processing alternatives; implementation; case study.
BS673 Commercial Systems Design

Course objectives
After completing this unit, students should be able to:
- specify an appropriate hardware configuration for a given system requirement specification;
- design all aspects of a batch-processing system and understand the limitations of this approach;
- specify the gross design considerations for on-line systems.

No prior systems knowledge is assumed, however students are strongly advised to undertake some preliminary reading.

Course structure
The physical design of computer subsystems: delineating man/machine responsibilities; design of information presentation; data capture and transmission; documentation techniques and standards; security and controls.

References
Janca, E. Audit and Control of Computer Systems. N.Y., Petrocelli/Charter, 1974

BS674 Current Issues in Systems Design

Course objectives
In this unit, some of the most recent developments and trends in computer applications and technologies are examined, to:
- encourage students to appraise critically the state of the art developments and evaluate them for relevance to their own environment;
- communicate recent systems design techniques; provide an awareness of the anticipated directions within the computer industry.

Usually candidates will have completed successfully, BS673 Commercial Systems Design prior to attempting this unit.

Faculty of Business

Course structure
Developments in computer hardware, and the changing role of design for performance;
telecommunications technology and today's network architectures: network design techniques;
improving the person/computer interface: computer psychology and modern dialogue design;
data base architectures, and evaluating data base management systems;
canonical data structures: the design of stable data bases; the elements of data base administration: tools and techniques; future directions; creative systems design.

References
In addition to numerous periodicals and journals, the following texts will serve as a guide:

BS675 Systems Project Management

Course objectives
After completing this unit, students should be able to:
- co-ordinate the skills of a systems development team, users and operators;
- prepare and present systems proposals to various levels in an organisation; evaluate both the feasibility of suggested projects and the viability of suggested solutions;
- plan and control the implementation of new systems.

No formal prerequisites are specified. However, it will be assumed that candidates have a prior knowledge of the systems development process equivalent to that gained from completing BS673 Commercial Systems Design.

Course structure
Project teams and their management; project leadership; selection and evaluation of systems projects; proposal presentation and promotion; proposal evaluation; developing project team expertise; methods for achieving optimum productivity in systems development; computer-assisted methods of systems design; the implications of changing systems; implementation of systems projects.

References
Brandon, D.H. Data Processing Organization and Manpower Planning. N.Y., Petrocelli, 1974
Sollenberger, H.M. Major Changes Caused by the Implementation of a Management Information System. N.Y., N.A.A., 1971
Tricker, R.I. Management Information and Control Systems, Lond., Wiley, 1976
Kraft, P. Programmers and Managers. N.Y., Springer-Verlag, 1977
**BS676 Operations Management**

**Course objectives**

After completing this unit, students will be able to:
- plan and control the use of data processing resources
- select, justify and choose appropriate methods of acquiring data entry equipment, computer equipment and personnel
- manage the introduction of new projects and the continuation of existing projects.

No formal prerequisites are specified. However, it will be assumed that candidates have a prior knowledge of administrative theory and practice and of computer systems depending on the students' interests and prior knowledge;

**Course structure**

The full scope of the course. The texts being considered at present include:

- **Davis, G.B. Management Information Systems.** N.Y., McGraw-Hill, 1974
- **Tricker, R.I. Management Information and Control Systems.** Lond., Wiley, 1976

**BS678 Systems Development Project**

( Elective unit)

The objective of this project is to:
- provide the student with supervised and structured practical experience in the development of computer-based management systems;
- allow the student to demonstrate a creative faculty in the area of systems design;
- provide an integration of the student's understanding of data processing by encouraging the drawing together of various concepts and techniques developed during the course;
- provide the student with an opportunity to develop the ability to communicate through the presentation of written and oral project reports.

Candidates usually will have gained above average results in all first year units required for the course, prior to commencing this project.

**Course structure**

Each student undertakes an individual project which is based on an actual commercial system, usually in the student's own work environment. The student initially submits a written proposal giving preliminary details of the project. If the proposal is approved in principle a supervisor is appointed who contacts the organisation concerned to ensure its support for the project and to determine that it is both meaningful and feasible.

The types of project likely to be approved vary substantially in content. They can be drawn from any area in the course which would enable the student to apply the knowledge gained in the course under the guidance of a supervisor. The supervisor is responsible in making sure that the student does not deviate too far from the original objectives specified for the study.

The student should submit a written report on the project study. This report should include:
- a definition of problem; an appraisal of the work undertaken; a description and specification of the proposed solution to the problem; an evaluation of the proposed system.
- This written presentation is supported by an oral presentation of the major factors associated with the project.

The project is assessed under several broad categories including:
- the student's initiative and industry during the period of the project study;
- the student's understanding of the project and its related background;
- the content and presentation of the final report;
- the degree of acceptability of the proposed system.

**BS677 Management Systems**

**Course Objectives**

This unit covers the theory of management information systems and their application for decision-making in organisations. The student should be able to:
- identify the decision requirements for the management of an organisation;
- analyse an information-gathering and processing system intended to facilitate decision-making and long-range planning;
- measure the effectiveness of an information system;
- evaluate the social implications and technical feasibility of an information system.

Candidates usually take this unit in the last semester of the course.

**Course structure**

Introduction to management information systems; the development of management information systems; technical considerations; social considerations.

**References**

No single book covers the full scope of the course. The texts being considered at present include:

- **Davis, G.B. Management Information Systems.** N.Y., McGraw-Hill, 1974
- **Tricker, R.I. Management Information and Control Systems.** Lond., Wiley, 1976

**BS681 The Organisation**

A first year subject in the graduate diploma course in organisation behaviour

The subject is concerned with:

(a) a comparison of ways of describing and analysing organisations;

(b) the identification of organisational problems and the consideration of solutions;

(c) the exploration of the variables in a systems approach to organisational effectiveness.

**Textbooks**

- Khandwalla, P.N. Design of Organisations. N.Y., Harcourt, Brace, Jovanovich, 1977
References

BS682 Managing Conflict and Change in Organisations
Four hours per week for one semester.
A second year subject in the graduate diploma course in organisation behaviour.
This subject provides a systematic approach to studying the nature of change and conflict in organisations. Students awareness of the need for managing change and increased understanding of the causes of conflict is achieved. Techniques for managing situations which are changing and where conflict is likely to occur are examined and to a degree practised (e.g. some organisation development interventions). Behavioural science concepts are applied to the resolution of industrial conflict. As far as practicable course concepts applied to current organisational situations.
The role of change agents is another topic.
A variety of teaching methods is adopted, but an experiential learning model underpins the educational philosophy of the subject.

Texts and references
To be selected.

BS683 Management and Leadership in Organisation
Four hours per week for one semester
A second year subject in the graduate diploma course in organisation behaviour.
This subject integrates and applies material from the previous subjects in the course and introduces material from the managerial sub-system model.
Key topics are:
(1) the manager’s role
(2) techniques of managerial behavioural research, including a minor project
(3) leadership theory
(4) development of leadership skills
(5) managerial behaviour and group dynamics
(6) decision-making and problem solving
(7) organisational climate and effective management
(8) future and changing roles of management.

References
To be selected

AT693 Psychology and Interpersonal Skills
This subject is designed for students taking the graduate diploma course in organisation behaviour.
The intention is:
(1) to introduce basic psychological concepts and techniques relevant to personal and inter-personal behaviour;
(2) to help participants determine their own perceptual and learning styles, values, attitudes and motivations and to gain insight into how these may interact with behaviour;
(3) to increase communication options through learning particular skills;
(4) to increase access to personal and community resources.
The methods used in a largely co-operative approach are mainly experiential. Participants have the opportunity to acquire cognitive models, and also to put these models into practice.
Reading and other resources are given where appropriate.

BS751 Research Paper
The object of the research paper is to demonstrate the students’ ability to apply theoretical concepts, of their own choosing, to a practical situation. The paper may be a discussion of how the concept could be applied in an organisation, indicating likely difficulties of such an application; or alternatively, the paper could be an analysis of a concept actually in use, discussing either its usefulness, or the techniques that are necessary for its implementation.
The length of the paper should be between 10,000 and 12,000 words.
To assist students to complete their research paper, there will be formal sessions in research methodology during the second semester each year.

References
Sterling, R.R. ed. Research Methodology in Accounting. Lawrence, Kansas Scholars Book Co., 1972
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— Undergraduate courses ......................... EN26
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Department of Mechanical Engineering
— Undergraduate courses ......................... EN31
— Postgraduate courses ......................... EN32

Subject details ........................................ EN34
General information ................................. G1
Courses offered
The Faculty of Engineering includes the departments of Civil Engineering, Electrical and Electronic Engineering, Manufacturing Engineering, and Mechanical Engineering. Professional courses offered by the Faculty within these departments are as follows:

Department of Civil Engineering
Degree of Master of Engineering
*Degree of Bachelor of Engineering (Civil)
Graduate Diploma in Civil Engineering
Graduate Diploma in Civil Engineering Construction
Graduate Diploma in Transportation Systems
Graduate Diploma in Urban Systems
†Diploma of Engineering (Civil)
Diploma of Building Surveying
(Introduction of this course is subject to approval by tertiary education authorities)

Department of Electrical and Electronic Engineering
Degree of Master of Engineering
*Degree of Bachelor of Engineering (Electrical)
Graduate Diploma in Digital Electronics
Graduate Diploma in Energy Systems
†Diploma of Engineering (Electrical)
†Diploma of Engineering (Electronic)

Department of Manufacturing Engineering
Degree of Master of Engineering
*Degree of Bachelor of Engineering (Manufacturing)
Graduate Diploma in Biochemical Engineering
Graduate Diploma in Chemical Engineering
Graduate Diploma in Industrial Management
Graduate Diploma in Manufacturing Technology
†Diploma of Engineering (Chemical)
†Diploma of Engineering (Production)
$Associate Diploma in Production Engineering

Department of Mechanical Engineering
Degree of Master of Engineering
*Degree of Bachelor of Engineering (Mechanical)
Graduate Diploma in Air-conditioning
Graduate Diploma in Maintenance Engineering
†Diploma of Engineering (Mechanical)

For details of these courses see sections for the above departments.
*Cooperative/sandwich courses with periods of work experience.
†These courses are being phased out. No new enrolments will be accepted.
$This is a para-professional course.
Cooperative education

A feature of Swinburne engineering degree courses is their four-and-a-half-year cooperative education format. In a cooperative (sometimes called 'sandwich') course the student learns in both an academic and a work situation, where these two phases of learning are related in an overall plan.

The paid work experience is arranged by Swinburne and undertaken in two semesters, each of six months, during the third and fourth years of the course. While working, the student is supervised both by the employer and a member of the Swinburne academic staff who acts as the student’s industrial tutor. Satisfactory completion of each work experience period is a prerequisite for admission to the next academic stage of the course.

Students who undertake cooperative education courses derive many benefits. Some of these are as follows:

(a) research shows that a student’s academic performance is enhanced following work experience.
(b) students receive recognised rates of pay for the twelve months’ work experience.
(c) students can sample particular areas of their chosen branch of engineering before graduation.
(d) students work on real engineering problems in industry.
(e) on completion of the course the young engineer’s employment opportunities are enhanced because of previous industrial experience and availability at mid-year when job opportunities exist.

The cooperative format is also used for the Diploma of Building Surveying and the Associate Diploma in Production Engineering.

Cooperative employers of Swinburne engineering students

The following are, or have been recently, associated with courses in civil, electrical/electronic, manufacturing, and mechanical engineering.

APM Ltd
AVH Electrical Industries Pty Ltd
Advance Industries Ltd
Aeronautical Research Laboratories
Ajax Pumps
Alcoa of Australia Ltd
Alex Folley Pty Ltd
A.W. Allen Ltd
Anthony Bearings Pty Ltd
Arcan Engineering Pty Ltd
Austral Standard Cables Pty Ltd
Australian General Electric (Appliances) Ltd
Australian Glass Manufacturers Co.
Australian Iron & Steel Pty Ltd
Australian Portland Cement Ltd
Autonomous Energy Systems
Belco Controls Pty Ltd
B.X. Plastics (Aust.) Pty Ltd
Brownbuilt Ltd
CFM Aluminium Fabricators
CIG Ltd
CSIRO
Carlton & United Breweries Ltd
City of Box Hill
Brighton
Camberwell
Doncaster & Templestowe
Hawthorn
Heidelberg
Knox
Malvern
Nunawading
Ringwood
St Kilda
Waverley
Clark Rubber
G.J. Coles
Comfort Piling and Engineering Edn Berhad
Commonwealth Aircraft Corporation
Companion Pty Ltd
Consolidated Electronic Industries Pty Ltd
Containers Ltd
Country Roads Board
Cyclone KM Products Pty Ltd
Dalsounre Pty Ltd
Dandenong Valley Authority
W.A. Deutscher Pty Ltd
Department of Construction
Department of Defence
Department of Industry and Commerce
Department of Transport
Department of Works
Dorf Industries Pty Ltd
Dunlop Australia Ltd
Duranol Plastics
East Coast Earthmoving
E.Z. Industries Ltd
Ensign Dry Cleaners (Vic.) Pty Ltd
Email Ltd
Englehard Industries Pty Ltd
L.M. Ericsson Pty Ltd
FRS Industries
P.E. Frye Pty Ltd
GBS Hard Metal Co
J. Gadsden Pty Ltd
Gardner & Naylor Pty Ltd
General Motors-Holden Pty Ltd
Government Aircraft Factory
Gutteridge Haskins & Davey Pty Ltd
Holeproof Ltd
Housing Commission of Victoria
ICI Australia Ltd
Ingersoll-Rand (Aust.) Ltd
Insulwool Products
International Harvester Co. of Aust. Pty Ltd
Irwell Pty Ltd
James Miller Holdings Ltd
John Connell & Assoc.
K. & G. Johnston Pty Ltd
Robert Jones Engineering Pty Ltd
Kempthorne Lighting Co.
G. Kennon & Co. Pty Ltd
Keogh Wood and Partners Pty Ltd
Kinnaird Hill DeRohan & Young
Faculty of Engineering

Kraft Foods Ltd
Krew Trading Co.
L & L Printed Art
David Linacre Pty Ltd
Malaysia International Consultants
Mepersons Ltd
— Machine Tool Division
— Engineering Research Department
McConnell Dowell Constructors Ltd
Master Steel Pty Ltd
Melbourne Harbour Trust
Melbourne & Metropolitan Board of Works
Melbourne and Metropolitan Tramways Board
Mica & Insulating Supplies Co. Pty Ltd
Mobil Oil Aust. Ltd
Moran Upholstery
Motorola Communications
Myton Rodd Ltd
Neta Industries
Nissan Motor Co. (Aust.) Pty Ltd
Noel M. Heather and Co. Pty Ltd
Nylex Corporation Ltd
Ogden Industries Pty Ltd
P.B.R. Industrial Co. Pty Ltd
Philip Morris Ltd
K.G. Pizzey Pty Ltd
Plasdip Industries
Premwirre Metal Industries Pty Ltd
Public Works Department
Raywood Electronics
Reed Paper Products Ltd
Reinforced Plastics Pty Ltd
Repcos and its subsidiaries:
— Repco Engine Parts Pty Ltd
— Patons Brake Replacements Pty Ltd
— Repco Bearings Co. Ltd
— Cork Manufacturing Co.
— Repco Lorimer
Reva Plastics Pty Ltd
Reynolds Tanning Co. Pty Ltd
Reyrolle Ltd
Rheem Aust. Ltd
Robert Bosch (Aust.) Pty Ltd
Robert H. Grant Pty Ltd
Rocla Industries Ltd
John Scroggie Pty Ltd
Scientific Electronics Pty Ltd
Scott & Furphy Engineers Pty Ltd
Selectronic Components
Shell Company of Australia Ltd
Shire of Eltham
Healesville
Siddons Industries Ltd
Silentbloc (Aust.) Pty Ltd
Sperry New Holland
State Electricity Commission of Victoria
State Rivers & Water Supply Commission
Strand Electric (Aust.) Pty Ltd
Sutton Tools Pty Ltd
Telecom Australia (Victoria Division)
The Stanley Works Pty Ltd
W.C. Stevens (Vic.) Pty Ltd
Unbrako (Aust.) Pty Ltd
V.D.O. Instruments (Aust.) Pty Ltd

Varian Techtron Pty Ltd
Vickers Ruwolt Pty Ltd
Victorian Railways
Vulcan Australia Ltd
Wilmot Breeden (Aust.) Pty Ltd
Wilson Transformers
W. D. & H. O. Wills (Aust.) Ltd
Zenford Pty Ltd
Advice to prospective students
First year engineering degree

Secondary students should note that there are no prerequisite subjects for degree courses in civil, electrical/electronic, manufacturing, or mechanical engineering. However, a strong background in mathematics and the physical sciences is important for students planning to enter one of these courses.

Recommended year twelve subjects are English and at least three subjects from the areas of mathematics and the physical sciences. A suitable selection of year twelve subjects would be English, chemistry, physics, pure mathematics, and applied mathematics. Students who do not obtain results of Grade D or higher in recommended subjects at year twelve level (but satisfactorily complete year twelve) may apply for entry to first year. Students in this category should note that they will, if admitted, find first year studies in mathematics and physical sciences more difficult than students who have completed recommended year twelve subjects.

Special study programs in first year may be available for students entering without the recommended subjects. These programs are offered either before or during first semester.

Students completing the Swinburne Technical College Tertiary Orientation Program will gain preferred entry without quota restrictions.

A feature of Swinburne's engineering degree courses is the common first year program which enables a student commencing a course to defer making a final decision on the branch of engineering to be undertaken until the end of first year.

The subjects comprising first year are intended to form a firm foundation on which studies in later years are built. Considerable emphasis is placed on the development of fundamental scientific principles and an introduction to engineering technology and techniques. Elective studies in civil, electrical, manufacturing and mechanical engineering provide students with an opportunity to develop their interest in the branch of engineering in which they propose to specialise.

Another feature of all degree courses is their four-and-a-half year (nine semester) cooperative education format. The program consists of seven semesters of academic tuition in the institute plus two semesters of work experience. The course structure for engineering degree courses is shown in the sections pertaining to the various departments of the engineering faculty.

Second and later years — engineering degree

Students who have completed, or partially completed, an engineering course at another tertiary institution may apply for entry to an engineering degree course at Swinburne. Applications in this category are essentially considered on the basis of the course studied by the applicant and the results obtained. Enquiries should be directed to the head of the engineering department concerned.

The policy of the Engineering Faculty Board regarding admission with advanced standing is stated in the section entitled 'Admission with advanced standing'.

Diploma of Building Surveying

There are no prerequisite subjects other than English for entry to the Diploma of Building Surveying. Recommended year twelve subjects include a branch of mathematics and physics and students are advised to have studied these to at least year eleven level.

Students who have completed a Certificate of Technology course in an appropriate area will be admitted with some exemptions, as appropriate.

Associate Diploma in Production Engineering

There are no prerequisite subjects for entry to the Associate Diploma in Production Engineering other than satisfactory completion of year twelve. It is recommended that students have passed Mathematics to at least year eleven level.

Admission to first year degree courses
Selection

Applications for first year are considered by the Engineering Faculty Selection Panel which consists of the Dean of the Faculty (or his nominee) together with a representative from each of the four engineering departments. The panel is responsible for selecting those applicants who are considered most likely to complete the course concerned satisfactorily.

Selection is based primarily on academic merit as assessed by results achieved in year twelve (sixth form) subjects, or their equivalent.

The selection panel may also take into account other factors such as:
(a) the results of any subsequent tests or examinations attempted. For example, some applicants may be invited to undertake a test such as the Australian Scholastic Aptitude Test, prepared by ACER;
(b) information obtained from any interviews that the selection panel may arrange.

Entrance requirements

Standard entry to the first year of an undergraduate degree course in engineering requires satisfactory completion of year twelve (sixth form) in a Victorian secondary school or its equivalent. Recommended subjects are English and at least three subjects from the areas of mathematics and the physical sciences.

A suitable selection of year twelve subjects would be English, chemistry, physics, pure mathematics and applied mathematics.

Special study programs in first year may be available for students entering without the recommended subjects. These programs are offered either before or during first semester.
Applicants who complete the science/engineering course satisfactorily in the Tertiary Orientation Program offered by the Swinburne Technical College will be given preferred entry to the first year without quota restrictions. This course comprises English, chemistry, physics, science/engineering mathematics, and concepts of mathematics. Applicants who have studied other Tertiary Orientation Program subjects at Swinburne will be considered for entry on their merits.

Application procedure
In addition to the information given below applicants should refer to the section entitled, ‘Application procedure’, in the general section of the handbook.

Full-time
Applications for entry to full-time first-year courses, with the exception of students undertaking Tertiary Orientation Program courses at Swinburne Technical College, must be made through the Victorian Universities Admissions Committee, 11 Queens Road, Melbourne 3004. The closing date for applications is approximately the end of October in the year of application.

Applicants undertaking Tertiary Orientation Program courses at Swinburne Technical College who wish to enter first year of an engineering course need not apply through Victorian Universities Admissions Committee (VUAC). Applicants in this category are required to present for enrolment on the day which is set aside for re-enrolling engineering students in December. Details regarding re-enrolment will be posted on institute notice-boards during the examination period in November/December. Re-enrolment information will be mailed to Tertiary Orientation Program students in the science/engineering course at Swinburne Technical College.

Part-time
All engineering degree courses can be completed on a part-time basis. Applications for admission to part-time study in engineering degree courses must be made directly to the institute and not to VUAC. Application forms are available from the Information Office, telephone 819 8444.

The closing date is usually the middle of January in the year of application.

Mature-age entry
Special provision is made for mature-age entry to engineering degree courses. The scheme is designed for applicants who have not satisfied the standard entry requirements but who are able to demonstrate that they can cope with their proposed course of study. This provision is not intended for students who have recently failed the year twelve examinations.

Applicants in this category are generally people in, or beyond, their early twenties who have some years of work experience.

The Engineering Faculty Selection Panel may require a mature-age applicant to undertake a special entry test early in February and present for an interview at the institute.

Mature-age applications should be made directly to the institute. Application forms are available from the Information Office telephone 819 8444.

The closing date for applications is usually the middle of January in the year of application.

Deferment
Applicants offered a place in first year for 1981 may apply for deferment until 1982. Applications for deferment should be made in writing and directed to the Registrar.

Deferment will be virtually automatic for those who apply as soon as the offer of a place is made. Later applicants may be asked to give reasons for their request for deferment.

Applicants who are granted a deferment will be notified in writing by the Faculty Secretary.

Admission to second and later years
Applicants seeking a place in second or later years of an engineering degree course as either full-time or part-time students must apply directly to the institute.

Application forms are available from the Information Office, telephone 819 8444.

The closing date for applications is usually the middle of January in the year of application.

(See the section entitled ‘Admission’ for details of the Engineering Faculty Board regulations regarding admission with advanced standing.)

Admission to graduate diploma courses
Graduate diploma courses in a range of specialist areas of importance to engineers are available as part-time evening classes. The usual entry requirements are completion of a degree or diploma in a field of engineering or applied science.

Applicants for these courses must apply directly to the institute. Application forms are available from the Information Office, telephone 819 8444.

The closing date for applications is usually the middle of January in the year of application.

Admission with advanced standing
All applicants who have successfully completed, or partially completed, an acceptable post-secondary course may be admitted with advanced standing to an engineering course at Swinburne. The policy of the Engineering Faculty Board with regard to admission with advanced standing is set out in the following regulations:

1 General

1.1 The Faculty Board believes that in general students who have completed satisfactorily, part of an engineering course at another ter-
1.2 In the consideration of applications for credit the following principles will be applied by the Board:
(a) A student should be brought on to a standard course as soon as possible after entry into the institute
(b) Students should not undertake subjects in advance of the semester in which they will enter the standard course
(c) Students who have passed a particular level of a similar course at a different institution may be admitted to the standard course at the next successive year's level, either with or without small amounts of additional course work being required
(d) Consideration should be given to the intention of a series or group of subjects rather than the details of the content matter of each subject within such series or group
(e) A credit may be granted on the basis of relevant industrial experience.

1.3 For all graduate diploma courses offered by the Faculty of Engineering, a student must complete at least sixty per cent of the prescribed total course time for that particular course at Swinburne Institute of Technology.

2 Application

2.1 In applying this policy the Board will follow these guidelines:
(a) Except in extraordinary circumstances credits are only approved at the beginning of a course of study
(b) Credits are to apply only to a specified course of study at the institute
(c) A credit shall be valid for a particular course and syllabus only for the duration of such course or syllabus
(d) In order to qualify for an award in the Faculty of Engineering a student must complete as a minimum, an equivalent full-time final year in the Faculty.

2.2 In order to request credit, students entering a course will be required to do as follows:
(a) Register their intention to seek admission with advanced standing at the time of first enrolment
(b) Lodge supporting documentation with their department within six months of registering their intention.

Course requirements

Class time-tables
The syllabus for each of the engineering courses may be found in the separate sections pertaining to the various departments of the engineering faculty.

Provisional time-tables for all years of engineering courses will be displayed at enrolment. Students should note that these time-tables are provisional only and may be changed depending on staff and facilities available. Where it is necessary to change a time-table, details will be posted on the faculty or departmental notice-board, as appropriate.

Many subjects are offered as part-time evening classes. Enquiries regarding subjects available on a part-time basis should be directed to the head of the relevant department.

Practical work
Practical work forms a significant part of most subjects offered by the engineering faculty.

Students are expected to attend all practical work sessions (for example, laboratory work, drawing office and field work, excursions and site visits) and to complete all the practical work assignments set by the lecturers responsible for a particular subject. Assignments not submitted by the due dates may fail to count as practical work completed.

Students should approach their lecturers to find out the details of practical work requirements in each subject.

Electives
Engineering degree courses (1980 syllabus) include a number of elective areas of study. Students should note that the range of electives offered in any one year depends on the number of students wishing to undertake a particular elective and on the staff and facilities available.

(a) In first year, students are given the opportunity to choose one subject from the four technical electives available in the course areas of civil, electrical, manufacturing, and mechanical engineering. These subjects of thirty hours each are taught in the second semester and are intended to enable students to develop their interest in the various branches of engineering. Students should note that a particular technical service elective is not a prerequisite for entry to the second-year course in the directly related branch of engineering. For example, a student who does not take the civil engineering elective but passes first year, can proceed to the second year of a civil engineering course without carrying an additional subject.

(b) Some first-year subjects (Engineering Drawing, Engineering Practices and Processes, and Thermodynamics and Heat Transfer) include elective components within the prescribed course of study which enable students to make a selection from the elective topics available. The elective components are within the subject concerned so that students are not required to select a specific component at enrolment.

(c) All degree courses include provision for two general elective subjects in a non-scientific/technical
area to be taken in later years. General electives of forty-five hours each are chosen from nominated Liberal Studies subjects or other approved subjects from the Faculties of Art, Arts or Business.

A list of approved subjects will be published at the start of each year. Students wishing to take a subject that is not included in the list must obtain the approval of their head of department before enrolling for the subject in question. Students must ensure that the subject chosen will fit into their time-table without difficulty.

The two general elective subjects are compulsory for all degree students.

(d) In later years of all courses elective subjects are available which enable students to achieve some measure of specialisation in their chosen branch of engineering. See the appropriate engineering department section for further details.

Examinations and assessment

Various methods are used to measure student performance in subjects offered by the engineering faculty. These methods include the use of formal examinations; tests held during, or at the end of, each semester; project work; assignments; laboratory exercises, etc. A statement setting out the assessment assessment and workload requirements for each subject is issued to students early in each semester. To assist students in determining their complete workload in any one semester, each engineering department maintains a record of the overall work program for students in each year group of a full-time course. The work program is displayed in the engineering department concerned.

Students are automatically entered as candidates for all subjects in which they enrol. Students should therefore carefully check their statement of enrolment which is posted to them approximately four weeks after the commencement of each semester. A student who withdraws from a subject after the end of the seventh week of the semester in which final assessment for that subject takes place will be recorded as having failed that subject unless special permission to withdraw has been given by the head of the student's awarding department.

For 1980 syllabus degree courses, the duration of each academic semester will be eighteen weeks which includes, subject to approved variations:

(a) fifteen weeks of teaching;

(b) a non-teaching week in the sixteenth week for revision or reflection; and

(c) formal tests/examinations in the seventeenth and eighteenth weeks.

The specific weeks devoted to these activities in 1981 are given in the institute calendar in this handbook.

For each subject the total time for formal tests/examinations per semester will be no longer than 1/15th of the formal contact time or four hours whichever is the lower.

(Students should also refer to the section entitled 'Regulations concerning assessment' in the general section of this handbook.)
Passing by years

1 General

The Engineering Faculty Board operates a scheme of block passing by years which enables an engineering student to be assessed on a block of work rather than individual subjects. The scheme applies to the following students:

(a) All full-time undergraduate students in cooperative courses or in the diploma in chemical engineering.
(b) For third and fourth year mechanical engineering degree students the block passing concept operates on an omnibus subject basis rather than a yearly basis. See the section entitled ‘Department of Mechanical Engineering’.
(c) All part-time undergraduate students whose weekly workload is ten or more contact hours.
(d) Graduate diploma students who satisfy the above requirement for part-time students.

*This applies to students enrolled in the four-year degree course (1971 syllabus)

Full-time students and may be re-admitted by Faculty Board to full-time study at such time as they become capable of entering a full-time year (or semester where applicable) without any carry over of subjects from earlier years (or semesters where applicable).

(c) Where a failed student is permitted by the head of department to enrol in a special remedial class, the lower of the two subject grades obtained by the student in the original and the remedial subject will be ignored in the determination of the faculty result.

(d) The achievement of a faculty pass will not alter results in individual subjects but will obviate the necessity to repeat subjects not passed in the group considered.

2 Part-time students

Part-time students who qualify and enter for a faculty pass for a group of subjects will receive a faculty pass result for that group and will not be required to undertake further study for subjects in the group. Results for individual subjects, however, will be unchanged. Thus, a part-time student who fails a subject but achieves a faculty pass for the group which includes that subject will have a fail recorded for the subject but will satisfy the course requirements for the subject.

3 Full-time students

*The Engineering Faculty Board system operates for full-time students as follows:

(a) A student in any year will be assessed on the whole of the year's work at the end of the second semester. A student will:

(i) pass the year by passing in all subjects (a 'Faculty Pass' outright); or

(ii) be passed by Faculty Board on the year as a whole (that is, be granted a 'Faculty Pass' on the year); or

(iii) not pass but be permitted by Faculty Board to repeat the year's work as a full-time student; or

(iv) not pass and be suspended from the full-time course (see para. 3 (b)).

(b) Students who achieve only limited success as full-time students and elect (and are permitted by Faculty Board) to enter part-time study in order to rehabilitate themselves, will be permitted to retain credit for any subjects passed as full-time students and may be re-admitted by Faculty Board to full-time study at such time as they become capable of entering a full-time year (or semester where applicable) without any carry over of subjects from earlier years (or semesters where applicable).

4 Special programs of study

Applicants with 'advanced standing' who are admitted to full-time studies may be enrolled in special programs of study as interim measures until they can be enrolled in the normal groups of subjects. The rules of block passing will apply. Such special programs require ratification by the Faculty Board.

5 Supplementary assessment

At the discretion of the Board, a scheme of restricted supplementary assessment operates for students who have achieved poor results (below N*) in one or two subjects. In any such cases consideration of a student's faculty result is deferred until the results of the supplementary assessments are available.

Note

N* = Fail but student appears to have made a serious attempt at the subject.

6 Faculty results

Students who have a workload which qualifies them for consideration under the passing by years scheme are eligible to enter for 'faculty result'. Eligible students are responsible for checking that their statement of enrolment makes provision for a 'faculty result' code. For undergraduate courses, codes are as follows:

Chemical Engineering
EA872 Full-time diploma year 1
PA874 Full-time diploma year 2
FA876 Full-time diploma year 3
FA892 Part-time diploma

Civil Engineering
FC982 Full-time degree year 1
FC984 Full-time degree year 2
FC986 Full-time degree year 3
The revised programs are structured in the **four-and-a-half-year** (nine semester) cooperative education format which consists of seven semesters of academic tuition in the institute plus two semesters of work experience.

Periods of paid work experience are an integral part of undergraduate degree courses in engineering. The work carried out by students during semesters of work experience is assessed. Satisfactory completion of a work experience session is a prerequisite for entry to the next academic stage of a course.

Further information relating to cooperative education courses is given in the booklet entitled **Guidelines for Cooperative Education** which is available from the Information Office.

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**Cooperative education requirements**

The policy of the Engineering Faculty Board is that all full-time undergraduate degree courses in engineering should be cooperative in format as defined in the following six parameters:

(a) The work experience amounts to at least twelve months in the total program.

(b) The institute is responsible for placing the students at work, for supervising the work experience and for all liaison with the employer.

(c) The work experience does not commence later than the third year of a course which would require four years of study in the traditional full-time format.

(d) The final period in the course is in the institute.

(e) For the work experience, the students are paid a salary commensurate with their qualifications and the duties entailed.

(f) The programs are such that a variety of industries may participate.

With the introduction of revised degree programs in 1980 all courses comply with the above parameters.
Guidelines for part-time study
With changes in the courses of study leading to degree qualifications, some part-time students may be unsure of the subjects they are required to pass in order to qualify for an award.

The following guidelines which the Engineering Faculty Board has established should be used to determine the subject requirements for students undertaking courses (including conversion programs) on a part-time basis:

(a) In general, students who have not at some time discontinued their course without permission, will follow the course of study in operation at the time of their initial enrolment at the institute and as specified in the engineering section of the handbook for that year.

(b) Despite the above, students who are undertaking a course of study which has been unduly prolonged, or who would benefit from transfer to a later course of study may be transferred by the Engineering Faculty Board on the advice of the students’ heads of departments.

(c) Students who discontinue study without permission and who later wish to renew their enrolment at the institute in that same course will be treated, as new students but will receive such credit for the subjects previously passed as is determined by the Engineering Faculty Board on the advice of the students’ heads of departments.

(d) Where subjects have been discontinued since students’ initial enrolment, students will be required to undertake the presently operating equivalent subjects. Information regarding superseded subject equivalents is available from the students’ heads of departments.

(e) As students will realise, there is often benefit in transferring from the course of study in operation at the time of enrolment to a later course of study. With the permission of the students’ heads of departments, students may transfer from the course of study for which they are enrolled to a later course of study but should recognise that such a transfer may involve the undertaking of some additional subjects.

Suspension from courses
The Engineering Faculty Board regulations regarding ‘passing by years’ (see section entitled ‘Course requirements’) refer to the status of full-time students who fail a year of their course. Paragraph J (b) of the regulations is as follows:

Students who achieve only limited success as full-time students and elect (and are permitted by Faculty Board) to enter part-time study in order to rehabilitate themselves, will be permitted to retain credit for any subjects passed as full-time students and may be re-admitted by Faculty Board to full-time study at such time as they become capable of entering a full-time year (or semester where applicable) without any carryover of subjects from earlier years (or semesters where applicable).

Enrolment
Although the institute academic calendar is divided into two teaching semesters, engineering students need enrol only once for the subjects they are undertaking in any one year. Where it is necessary to change the list of subjects entered for at enrolment a student must complete an Amendment to course or subjects form available from student records, the engineering faculty office, or engineering department offices. Students should note that they must obtain the approval of the head of their awarding department before amending their enrolment.

Applicants offered a place in an engineering course will be expected to attend for enrolment early in February. Successful applicants will be notified of enrolment times when they are offered a place.

Continuing students in engineering courses, ex-Swinburne Tertiary Orientation Program students, and applicants holding a deferred place are required to present for enrolment on the day which is set aside for re-enrolling engineering students in December. Details will be posted on institute notice-boards during the examination period in November/December. Deferrees and students granted ‘Leave of Absence’ will be notified in writing.

Re-enrolling students who commenced a full-time degree course prior to 1980 should note that revised degree programs will be introduced gradually. In some departments continuing students will be given an opportunity to transfer from their original course to the revised program. Enquiries regarding courses to be followed should be directed to the head of department.

For further information regarding enrolment see the section entitled ‘Enrolment regulations’ in the general section of this handbook.

Approval and publication of results
1 General

(a) The Engineering Faculty Board believes that all engineering students should be informed of their progress as soon as possible after any prescribed subject has been completed.

(b) Final results for first semester subjects may differ from provisional results as a consequence of a student’s performance in a corresponding second semester subject.

(c) The only grounds for deferral of subject results are medical grounds or other reasons of hardship as determined by the Faculty Board from time to time. Deferral of faculty results for supplementary assessment is covered under existing regulations (refer to ‘Passing by years’ regulations). The period of deferral will be determined by the Board in the light of particular circumstances.
2 Students undertaking academic programs in both semesters
(a) Official results are approved by the Board for publication by the Registrar's Department as soon as possible after students have completed the academic program for the year.

(b) Students are notified by the awarding department of provisional subject results (using approved institute assessment categories and examination numbers) for first semester no later than the end of the first week of second semester.

(c) Provisional subject results are initially released by the awarding department. Following the release of provisional subject results, awarding departments notify teaching departments of the subjects for which results have been made available. Teaching departments are then free to release results if they wish (in the same form as specified in paragraph 2 (b)) for the subjects concerned.

(d) Where a student receives a provisional result of fail in a 'stand alone' first-semester subject in which assessment is completed at mid-year and the subject concerned is available in second semester, the student may, with the approval of the head of the awarding department, re-enrol for the subject in second semester. Where re-enrolment takes place, the student's record for the year will show two results for the subject concerned.

3 Students undertaking cooperative education programs
(a) Subject results are approved by the Board for publication by the Registrar's Department as soon as possible after the completion of first semester. A student's faculty result will be determined at the end of second semester when results for the year's work are known, except for those students covered under paragraph 4 (a).

(b) Where a student fails a subject at the end of first semester but is allowed to undertake a period of work experience during second semester, the student may be required to re-enrol for the failed subject in second semester.

In cases such as this, the student's record for the year should show two results for the subject concerned. (In accordance with the Board's policy of upgrading results, the lower of the two grades will be ignored in applying the formula for faculty passing.)

4 Students completing courses of study before the end of the academic year
(a) Final-year results for students in cooperative courses are approved for publication by the Registrar's Department, as soon as possible after the end of first semester.

(b) Results for students who have completed outstanding subjects for an award at the end of first semester are approved for publication by the Registrar's Department, as soon as possible after the end of first semester.

5 Students undertaking the degree course in mechanical engineering
Final-year results for the degree in mechanical engineering are approved for publication by the Registrar's Department, as soon as possible after students have completed the academic work for the year.

* This applies to students completing the four-year mechanical engineering degree course (1971 syllabus)

Awarding of degrees with distinction
Each year the Engineering Faculty Board selects students to be nominated for a degree with distinction. The Board expects results at about the Higher Distinction level in major areas of study, with particular attention being given to performance in the last two academic semesters of the course.

In addition to considering the result categories received by students in the final two academic semesters, a subjective assessment of students in relation to their contemporaries and to absolute standards is made.

Prizes, scholarships and awards
A complete list of the sources of financial support and the various awards available to students is given in the general section of this handbook. Brief information on awards most likely to be of interest to engineering students is given below. Further details may be obtained from the careers information library of the Student Health and Welfare Unit.

W.P. Brown medal
This is awarded by the Institution of Engineers, Australia, to the best all-round student in the final year of an engineering course. The award is a medal and premium a premium of $100.

Aluminium Development Council scholarships
These are unbonded awards valued at $600 per year and available to engineering students in their third, and in some cases, second and fourth years. Applications close in December.

F.W. Green memorial prize
Books to the value of $50 are awarded to the most outstanding final year engineering student graduating each year.
Molyneux medal
A silver medal and a prize of $30 are awarded to the student in the final year of the Diploma of Chemical Engineering who presents the best process design thesis.

Society of Chemical Industry of Victoria prize
A certificate and a prize of $25 is awarded to the student nominated by the Department of Manufacturing Engineering as the best student in the final year of the Diploma in Chemical Engineering.

Oscar Weigel exhibitions in engineering
Applicants for these awards must be qualified to enter the second or a later year of an engineering degree course or be accepted as a candidate for a Master's degree. Value — up to $400 per year and tenable for a period not exceeding five years.

Postgraduate awards
The Commonwealth Department of Education provides awards for full-time research leading to the Master's degree. The closing date for applications is 31 October in any year.

Some industrial organisations also make available awards for full-time research leading to a Master's degree. Further information may be obtained from the head of each engineering department.

Short courses
In addition to the accredited courses leading to diploma and degree qualifications the engineering faculty also offers a wide range of short courses. These are usually of two to three days' duration and are designed to enable various industrial personnel to update their skills and knowledge in areas of specific interest. Typical courses offered recently include:

Acoustics, antennas, digital techniques, human factors engineering, metrology, machining technology, microprocessors, residential raft slab design, network analysis, construction planning.

Further enquiries should be directed to heads of engineering departments.

Professional recognition of courses
Institution of Engineers, Australia
The courses for degrees of Bachelor of Engineering, in civil, electrical, manufacturing, and mechanical engineering, have all received recognition from the Institution of Engineers, Australia, as satisfying academic requirements for corporate membership.

Students who are enrolled for engineering courses at Swinburne and are at least 17 years of age may apply to the Institution of Engineers, Australia, to become student members. Application forms are available from engineering department offices and the engineering faculty office.

Other professional bodies
The course for the Diploma of Engineering (Chemical) is recognised by the Royal Australian Chemical Institute, the Bachelor of Engineering (Manufacturing) is recognised by the Institution of Production Engineers and the degree in electrical engineering is recognised by the Institution of Radio and Electronics Engineers (Australia) as sufficient academic qualification for membership.
Department of Civil Engineering

The department offers a range of tertiary courses in civil engineering, including a cooperative degree, four graduate diplomas and a Master's degree by research.

The undergraduate degree course is a professional qualification in civil engineering which is recognised by the Institution of Engineers, Australia. The graduate diploma courses enable graduate engineers to undertake further specialised studies in major areas of civil engineering and urban planning. Masters’ degrees provide specialist research training in particular aspects of civil engineering. Continuing education courses for professional engineers are provided from time to time in selected subjects.

The civil engineering department operates a mentor scheme to facilitate contact between staff and students and to provide guidance to individual students, who have access to selected members of staff with whom they may discuss any matter related to their course.

The department undertakes applied research and consulting for the Swinburne Applied Research and Development Division. Staff members are available for consultation individually or as members of a team on group projects. Enquiries should be directed to the head of the department or to the Industrial Liaison Officer.

Courses offered

Degree of Bachelor of Engineering (Civil)
*Diploma of Engineering (Civil)
†Diploma of Building Surveying
Graduate Diploma in Civil Engineering Construction
Graduate Diploma in Civil Engineering
Graduate Diploma in Transportation Systems
Graduate Diploma in Urban Systems
Degree of Master of Engineering

*No longer open to new enrolments.
†Subject to approval by tertiary education authorities.

Career potential

Civil engineering offers a creative career for men and women in many differing areas of service to the community.

Civil engineers work as planners, designers, administrators, research engineers and consultants in a wide range of specialist fields, including:
- structural and bridge engineering
- foundation engineering, geology, soil and rock mechanics
- water engineering
- transportation engineering
- construction engineering
- municipal engineering
- environmental engineering and urban planning

Their work is interesting, rewarding and challenging and offers opportunities for both indoor and outdoor work, in Australia and overseas.

They qualify professionally by completing a tertiary course recognised by the Institution of Engineers, Australia, followed by four years of suitable professional experience. Swinburne's engineering degree course fully satisfies the Institution's requirements for graduate membership.

Swinburne civil engineering graduates have excellent career prospects because employers want graduates with experience and this is provided as part of the cooperative degree program. They find employment with consulting firms, private industry, public authorities, and state government departments and municipalities.

Other careers

Although most graduates in civil engineering enter the civil engineering profession, intending students should realise that a civil engineering course also provides an excellent basis for a successful career in many other areas of industry and management.

Women in engineering

Civil engineering provides women with a wide choice of interesting careers. Women in the civil engineering profession have proved to be extremely talented and have made significant contributions to the field, both in Australia and overseas. In recent years, an increasing number of women have successfully undertaken civil engineering courses at Swinburne.

Degree of Bachelor of Engineering (Civil)

This course of study is undertaken by a cooperative education program extending over four-and-a-half years and including two semesters spent working with professional civil engineers in industry.

The course is a general one which gives a good grounding in civil engineering. Some specialisation occurs in the final semester of the course when students choose electives from a range of specialist topics available.

Degree course revision

A revised course was introduced in 1980 and is now operating for all years except fourth year. Students entering fourth year in 1981 will undertake the 1971 revised course and transfer to the new (1980)course in 1982.

Part-time study

The degree course can be completed by part-time study. Students may select their own program of day or evening classes, from the required subjects of the course, with the approval of the head of department.

Structure of degree course

The degree course in civil engineering is structured on a cooperative basis, and consists of seven academic
semeesters in the institute and two semesters in industry. The total length of the course is four-and-a-half years.

In the third and fourth years, students spend one semester of each year in the institute and the remainder working in industry. This cooperative employment is arranged by the institute and students receive a salary approximately two-thirds that of a graduate engineer. Students benefit greatly from this first-hand industrial experience and consistent liaison is maintained between the institute staff, employer and student.

The fifth year, which consists of only one semester, is spent in the institute.

**Course structure**

First year (1980 syllabus)

- **AT194** Thinking and Communicating 60
- **CE111** Applied Mechanics 90
- **EE183** Electrical Circuits and Devices 60
- **ME125** Thermodynamics and Heat Transfer 60
- **MP101** Engineering Drawing 90
- **MP102** Engineering Practices and Processes 60
- **SC194** Chemistry 90
- **SK194** Computation 30
- **SM194** Mathematics 90
- **SP194** Physics 90
- Elective (1) from —
  - **CE102** Civil Engineering — Structures
  - **EE186** Electrical Engineering 30
  - **ME165** Mechanical Engineering Systems
  - **MP191** Manufacturing Engineering 750

Second year (1980 syllabus)

- **CE211** Structural Mechanics 90
- **CE231** Hydraulics 90
- **CE241** Surveying 120
- **CE251** Structural Design 120
- **CE261** Transport Engineering 45
- **CE281** Geoscience 90
- **MP282** Engineering Materials 30
- **SM292** Mathematics 120
- * General Elective 45

Third year (1980 syllabus)

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CE391</strong> Industrial Experience</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CE311</strong> Structural Mechanics</td>
<td>45</td>
</tr>
<tr>
<td><strong>CE331</strong> Water Engineering</td>
<td>45</td>
</tr>
<tr>
<td><strong>CE341</strong> Surveying</td>
<td>75</td>
</tr>
<tr>
<td><strong>CE351</strong> Structural Design</td>
<td>90</td>
</tr>
<tr>
<td><strong>CE361</strong> Transport Engineering</td>
<td>60</td>
</tr>
<tr>
<td><strong>SK390</strong> Computer Programming</td>
<td>15</td>
</tr>
<tr>
<td><strong>SM392</strong> Mathematics</td>
<td>45</td>
</tr>
</tbody>
</table>

Fourth year (1971 revised 1974 syllabus)

The students are divided into two groups:

**Group A**

<table>
<thead>
<tr>
<th>Semester 7</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC316</strong> Structural Mechanics</td>
<td>45</td>
</tr>
<tr>
<td><strong>EC335</strong> Hydraulics</td>
<td>90</td>
</tr>
<tr>
<td><strong>EC347</strong> Surveying</td>
<td>120</td>
</tr>
<tr>
<td><strong>SK327</strong> Computer Programming</td>
<td>15</td>
</tr>
<tr>
<td><strong>SM313</strong> Mathematics</td>
<td>60</td>
</tr>
<tr>
<td><strong>MT325</strong> Welding Technology</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 8</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC497</strong> Industrial Experience</td>
<td>360</td>
</tr>
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</table>

**Group B**

<table>
<thead>
<tr>
<th>Semester 7</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC498</strong> Industrial Experience</td>
<td>360</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 8</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC477</strong> Civil Engineering</td>
<td>315</td>
</tr>
<tr>
<td><strong>SM314</strong> Mathematics</td>
<td>45</td>
</tr>
</tbody>
</table>

For subject details of the 1971 revised course, refer to the 1979 handbook.

Fifth year (1980 syllabus)

- **CE501** Investigation Project 90
- **CE511** Civil Design 90
- **CE591** Professional Practices 60
- Electives (3) chosen from —
  - **CE511** Structural Mechanics
  - **CE531** Water Engineering
  - **CE532** Environmental Engineering
  - **CE552** Structural Design
  - **CE561** Transport Engineering
  - **CE571** Construction
  - **CE581** Geomechanics
  - **CE592** Municipal Engineering 375

For information only the proposed fourth year of the 1980 syllabus follows. It will be implemented in 1982.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CE411</strong> Structural Mechanics</td>
<td>60</td>
</tr>
<tr>
<td><strong>CE421</strong> Planning</td>
<td>30</td>
</tr>
<tr>
<td><strong>CE431</strong> Water Engineering</td>
<td>45</td>
</tr>
<tr>
<td><strong>CE451</strong> Structural Design</td>
<td>90</td>
</tr>
<tr>
<td><strong>CE481</strong> Geomechanics</td>
<td>60</td>
</tr>
<tr>
<td><strong>SM492</strong> Mathematics</td>
<td>45</td>
</tr>
<tr>
<td>* General Elective</td>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CE491</strong> Industrial Experience</td>
<td>375</td>
</tr>
</tbody>
</table>

*Approved subjects chosen from Art, Arts or Business
Diploma of Engineering (Civil)
No new enrolments are being accepted in this course. Only part-time classes for students currently enrolled will be available and it is expected that they will continue to be offered until the end of 1982. Students re-enrolling for the current diploma in 1981 will need to refer to the 1979 handbook for details of the program and subject requirements. Enquiries regarding part-time study programs should be directed to the head of the department.

Degree conversion program — 1980 syllabus
For diplomates
For persons holding the 1972 Diploma of Engineering (Civil) from Swinburne, or equivalent, the course to be followed to obtain the degree of Bachelor of Engineering (Civil), 1980 syllabus is:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Either</td>
<td></td>
</tr>
<tr>
<td>CE351 Structural Design</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>CE361 Transport Engineering</td>
<td></td>
</tr>
<tr>
<td>Plus</td>
<td></td>
</tr>
<tr>
<td>SK390 Computer Programming</td>
<td></td>
</tr>
<tr>
<td>SM392 Mathematics</td>
<td></td>
</tr>
<tr>
<td>CE411 Structural Mechanics</td>
<td></td>
</tr>
<tr>
<td>CE421 Planning</td>
<td></td>
</tr>
<tr>
<td>CE451 Structural Design</td>
<td></td>
</tr>
<tr>
<td>SM492 Mathematics</td>
<td></td>
</tr>
<tr>
<td>CE491 Industrial Experience</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subjects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CE551 Civil Design</td>
<td></td>
</tr>
<tr>
<td>CE501 Investigation Project</td>
<td></td>
</tr>
<tr>
<td>CE591 Professional Practices</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electives (3) chosen from:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CE552 Structural Design</td>
<td></td>
</tr>
<tr>
<td>CE571 Construction</td>
<td></td>
</tr>
<tr>
<td>CE532 Environmental Engineering</td>
<td></td>
</tr>
<tr>
<td>CE581 Geomechanics</td>
<td></td>
</tr>
<tr>
<td>CE592 Municipal Engineering</td>
<td></td>
</tr>
<tr>
<td>CE511 Structural Mechanics</td>
<td></td>
</tr>
<tr>
<td>CE561 Transport Engineering</td>
<td></td>
</tr>
<tr>
<td>CE531 Water Engineering</td>
<td></td>
</tr>
</tbody>
</table>

Notes
1. Students may be granted exemption from CE491 Industrial Experience if they have suitable engineering work experience.
2. In 1981 full-time students will be required to complete the conversion block as for the 1971 revised degree, followed by the final year of the 1980 course.
3. Diplomates from other institutes are considered individually.

Graduate Diploma in Civil Engineering
Construction
This course commenced in 1979 and is designed to provide practising engineers and architects with a knowledge of the latest developments in construction engineering and with the capacity to control these techniques from the financial and technical viewpoints.

The total course duration is 480 hours, normally undertaken as a two-year part-time course and requiring attendance for two nights of the week. The course is run over four semesters, each of fifteen teaching weeks.

The course emphasises the use of case studies in the learning program and students are expected to participate in syndicate discussion activity, especially in civil engineering areas. Parts of the course will be conducted in short periods of intensive full-time study to facilitate this syndicate discussion. During the course students are required to undertake industrially-oriented projects and are expected to be working in an engineering environment.

Practising construction engineers assist institute staff in teaching selected parts of the course.

Prerequisites
Students should have a professional qualification in engineering or architecture and a minimum of two years’ experience following graduation to gain admission to the course.

Course structure

<table>
<thead>
<tr>
<th>Course structure</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td></td>
</tr>
<tr>
<td>CE670 Construction Technology</td>
<td>60</td>
</tr>
<tr>
<td>CE690 Civil Engineering Project Control</td>
<td>60</td>
</tr>
<tr>
<td>CE691 Civil Engineering Management</td>
<td>60</td>
</tr>
<tr>
<td>CE692 Communications</td>
<td>60</td>
</tr>
<tr>
<td>Second year</td>
<td></td>
</tr>
<tr>
<td>CE770 Construction Engineering</td>
<td>120</td>
</tr>
<tr>
<td>CE771 Construction Project</td>
<td>60</td>
</tr>
<tr>
<td>CE790 Financial Project Control</td>
<td>60</td>
</tr>
</tbody>
</table>

Graduate Diploma in Civil Engineering
This course is designed to provide advanced studies in civil engineering for graduate engineers. The required entry qualifications are a diploma or degree in civil engineering or approved equivalent.

Three streams are available specialising in structures, hydraulics, or municipal engineering. The course takes three years of part-time evening study at the rate of two nights per week for thirty weeks of each year, but can be completed in two years by attending for three nights per week. The duration of each subject is 90 hours per year.

Course structure

<table>
<thead>
<tr>
<th>Structural stream</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td></td>
</tr>
<tr>
<td>CE611 Structural Mechanics</td>
<td></td>
</tr>
<tr>
<td>SM623 Engineering Mathematics</td>
<td></td>
</tr>
<tr>
<td>Second year</td>
<td></td>
</tr>
<tr>
<td>CE751 Concrete Design and Construction</td>
<td></td>
</tr>
<tr>
<td>CE752 Design of Steel Structures</td>
<td></td>
</tr>
<tr>
<td>Third year</td>
<td></td>
</tr>
<tr>
<td>CE881 Soil Mechanics</td>
<td></td>
</tr>
<tr>
<td>CE851 Design Projects</td>
<td></td>
</tr>
</tbody>
</table>
Faculty of Engineering

Hydraulics stream
First year
CE623 Town Planning
SM623 Engineering Mathematics
or
CE681 Geology
Second year
CE751 Concrete Design and Construction
CE731 Hydraulics and Public Health Engineering
Third year
CE881 Soil Mechanics
CE851 Design Projects

Municipal and highway engineering stream
First year
CE623 Town Planning
CE693 Powers and Duties of Local Government Engineers
Second year
CE671 Municipal and Highway Engineering
CE731 Hydraulics and Public Health Engineering
Third year
CE881 Soil Mechanics
SM623 Engineering Mathematics
or
CE681 Geology

Certificated Engineer
The Municipal Engineers Board of Victoria conducts examinations leading to the qualification of Certificated Engineer (CE), a postgraduate qualification required by all municipal engineers in Victoria. To provide training for engineers for their CE, the following subjects can be used as preparation for the municipal engineers' examinations. CE731 and CE693 can also be used as a preparation for the engineer of water supply examinations.

CE731 Hydraulics and Public Health Engineering
CE623 Town Planning
CE693 Powers and Duties of Local Government Engineers
CE761 Municipal and Highway Engineering

These subjects all form part of the municipal and highway engineering course as listed above.

Graduate Diploma in Transportation Systems
This course commenced in 1980 and is designed to fill a need in modern society for skilled transportation specialists. It is open to qualified engineers, town planners, architects, economists and surveyors.

Applicants with qualifications in science, mathematics or other areas will also be considered for admission.

Specific areas of study within the course are:
Environmental planning and urban design
Statistical techniques and computer applications
Transportation engineering and traffic engineering practice
Public and freight transportation systems.

In the first two years of the course considerable emphasis is given to the broad principles underlying the design and operation of public and freight transportation systems, including the environmental and sociological effects resulting from such systems. In the final year, transportation legislation is studied in detail, together with either a transportation case study or two elective topics.

Practising planners will assist institute staff in teaching selected parts of the course.

The course is designed to take three years of part-time study, necessitating two evenings per week attendance at the institute for thirty weeks during the year, but can be compressed into two years.

Course structure

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td></td>
</tr>
<tr>
<td>CE661 Environmental Planning</td>
<td>45</td>
</tr>
<tr>
<td>CE662 Transport Systems</td>
<td>45</td>
</tr>
<tr>
<td>CE663 Traffic Engineering Practices</td>
<td>45</td>
</tr>
<tr>
<td>SM601 Statistical Techniques</td>
<td>45</td>
</tr>
<tr>
<td>Second year</td>
<td></td>
</tr>
<tr>
<td>BS762 Transport Economics</td>
<td>45</td>
</tr>
<tr>
<td>CE762 Public Transport Systems</td>
<td>45</td>
</tr>
<tr>
<td>CE763 Freight Transport Operations</td>
<td>45</td>
</tr>
<tr>
<td>CE764 Urban Design</td>
<td>45</td>
</tr>
<tr>
<td>Third year</td>
<td></td>
</tr>
<tr>
<td>CE861 Transport Legislation</td>
<td>45</td>
</tr>
<tr>
<td>SK891 Computer Appreciation</td>
<td>45</td>
</tr>
<tr>
<td>CE863 Project: Case Study of Transportation Problem</td>
<td>90</td>
</tr>
<tr>
<td>or Electives (2) from</td>
<td></td>
</tr>
<tr>
<td>BS862 Advanced Transport Economics</td>
<td></td>
</tr>
<tr>
<td>CE865 Urban Design and Landscaping II</td>
<td></td>
</tr>
<tr>
<td>SK892 Advanced Computer Techniques</td>
<td></td>
</tr>
<tr>
<td>SM891 Advanced Analytical Techniques</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>585</td>
</tr>
</tbody>
</table>

Graduate Diploma in Urban Systems
This course is open to graduates with diplomas or degrees in engineering, architecture, surveying or other allied fields. Students qualified in science, mathematics or other fields and working at planning will also be considered for admission. The course provides specialist training in urban planning in the following areas:
Urban economics and urban sociology
Urban water supply, waste disposal, energy systems
Systems planning and modelling

The course emphasises a systems approach to planning in which information from a variety of disciplines is integrated for the solution of urban planning problems.

The course takes three years of part-time evening study at the rate of two nights per week for thirty weeks of each year.

The duration of each subject is 45 hours per semester.
Course structure

First year
- CE621 Urban Systems 1
- BS661 Urban Economics
- AT691 Urban Sociology

Second year
- CE721 Urban Systems 2
- CE722 Environmental Systems Management
- CE723 Urban Transport

Third year
- CE821 Urban Systems 3
- CE822 Urban Design

Electives from
- BS861 Urban Economics
- CE823 Urban Transport Systems
- CE824 Systems Planning
- CE825 Environmental Engineering
- AT791 Urban Sociology
- CE826 Urban Energy Systems

Master of Engineering

Graduates who have completed a Bachelor degree to a sufficiently meritorious standard may undertake study for the degree of Master of Engineering within the civil engineering department at Swinburne.

Two types of higher degree programs are available. The alternatives are:

(a) A program which requires the presentation of a major thesis based on original research, carried out under supervision at Swinburne by a candidate enrolled as a student of the institute.

(b) A program which requires the presentation of a major thesis based on original research, investigation, or developmental work carried out in an approved industrial, commercial, governmental or research organisation under the complete or partial supervision of the civil engineering department of Swinburne.

The duration of a higher degree course shall not be less than two years after the completion of a Bachelor degree.

In 1980, ten students were enrolled for Masters' degrees with the civil engineering department.

Diploma of Building Surveying

This is a new course which will commence in 1981. It is intended to prepare students for the profession of building surveying and to meet the educational requirements for membership of the Australian Institute of Building Surveyors. In recent years the AIBS has pressed for the development of more advanced courses in building surveying to enable future members of the profession to cope with anticipated changes in building technology and materials and this course has been designed to meet these needs.

Although the course is co-ordinated through the civil engineering department, it is interdisciplinary in nature, with a teaching input from a number of departments in both the institute and Swinburne Technical College.

Career potential

At present, about eight of every ten graduates in building surveying enter the municipal sphere and the others are absorbed in the building industry.

The building surveyor in a municipality is the Council's technical officer in matters pertaining to buildings and duties include the giving of advice to council on various parliamentary acts and regulations and council bylaws, and regulations relevant to building and their administration as required by law and by council. This department is responsible for checking of plans and computations submitted for council approval and for the carrying out of inspections of buildings during construction, alteration and demolition.

Career prospects are currently very good, since there is a continuing demand for building surveyors in the municipal field, with more restricted opportunities in the private sector.

Regulations pertaining to the course

Regulations relating to the course are set out at the beginning of this book.

Structure of the course

The diploma of building surveying is structured on a cooperative basis, and consists of five academic semesters in the institute and two semesters in industry. The total length of the full-time course is three-and-a-half years.

In the second and third years, students spend one semester of each year in the institute and the remainder of the time working in industry. This cooperative employment is arranged by the institute and students are paid by the employer. Students benefit greatly from this first-hand experience and a consistent liaison is maintained between the institute staff, the employer, and the student.

The fourth year, which consists of only one semester, is spent in the institute.

Part-time study

The course can be completed by part-time study. Students should consult with institute staff to plan a part-time program of day and/or evening classes from the required subjects of the course.

Course structure

<table>
<thead>
<tr>
<th>First year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB701 Building Structures 1</td>
<td>120</td>
</tr>
<tr>
<td>TB702 Building Practice</td>
<td>90</td>
</tr>
<tr>
<td>TB703 Scaffolding</td>
<td>90</td>
</tr>
<tr>
<td>CE112 Applied Mechanics</td>
<td>120</td>
</tr>
<tr>
<td>ME169 Building Services 1</td>
<td>105</td>
</tr>
<tr>
<td>MP182 Building Materials</td>
<td>75</td>
</tr>
<tr>
<td>AT195 Communications 1</td>
<td>60</td>
</tr>
<tr>
<td>BS196 Introductory Law</td>
<td>30</td>
</tr>
<tr>
<td>TB710 Statutory Control 1</td>
<td>60</td>
</tr>
</tbody>
</table>

720
## Second year

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE291</td>
<td>Industrial Experience</td>
</tr>
<tr>
<td>TB721</td>
<td>Building Structures 2</td>
</tr>
<tr>
<td>CE252</td>
<td>Structural Design 1</td>
</tr>
<tr>
<td>CE282</td>
<td>Geomechanics 1</td>
</tr>
<tr>
<td>TB712</td>
<td>Statutory Control 2</td>
</tr>
<tr>
<td>CE242</td>
<td>Land Surveying</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>360</td>
</tr>
</tbody>
</table>

## Third year

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB741</td>
<td>Building Structures 3</td>
</tr>
<tr>
<td>CE352</td>
<td>Structural Design 2</td>
</tr>
<tr>
<td>ME369</td>
<td>Building Services 2</td>
</tr>
<tr>
<td>AT397</td>
<td>Behavioural Studies</td>
</tr>
<tr>
<td>BS399</td>
<td>Administration 1</td>
</tr>
<tr>
<td>TB704</td>
<td>Practical Inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE392</td>
<td>Industrial Experience</td>
</tr>
</tbody>
</table>

## Fourth year

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE472</td>
<td>Building Structures 4</td>
</tr>
<tr>
<td>CE452</td>
<td>Structural Design 3</td>
</tr>
<tr>
<td>CE482</td>
<td>Geomechanics 2</td>
</tr>
<tr>
<td>CE422</td>
<td>Urban Planning</td>
</tr>
<tr>
<td>CE492</td>
<td>Building Law and Contracts</td>
</tr>
<tr>
<td>BS400</td>
<td>Administration 2</td>
</tr>
<tr>
<td>AT494</td>
<td>Communications 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>360</td>
</tr>
</tbody>
</table>

### Department of Electrical and Electronic Engineering

Electrical engineering is the branch of engineering concerned with any form of plant, system or device operated by electrical or electronic means, and is a wide field that includes several specialities, such as electronics, communications, control, electrical power and machines.

The department offers courses leading to professional qualifications in electrical and electronic engineering. In addition, continuing education courses in selected subjects for professional engineers are provided from time to time.

Modern laboratory facilities are available for undergraduate teaching, staff research and consulting. Separate laboratories are devoted to electric circuits, electronics, advanced electronics, communications, control systems and computing, electrical machines, power systems, and student design projects. A constant-temperature room is provided for the maintenance of electrical standards, and a high quality screened room is available for the conduct of measurements and experimentation in an interference-free environment.

A mentor scheme is operated by the department to facilitate contact between staff and students and to provide guidance to individual students. All students in electrical engineering have access to a particular member of staff with whom they may discuss any matter related to their courses.

The department undertakes applied research and consulting for the Swinburne Applied Research and Development Division. Staff members are available for consultation individually or as members of a team on group projects. Enquiries should be directed to the head of department or to the Industrial Liaison Officer.

### Courses offered

The Department of Electrical and Electronic Engineering offers the following courses:

- Degree of Bachelor of Engineering (Electrical)
- *Diploma of Engineering (Electrical)*
- *Diploma of Engineering (Electronic)*
- Degree of Master of Engineering
- Graduate Diploma in Digital Electronics
- Graduate Diploma in Energy Systems

*No longer offered to new enrolments.*

### Career potential

Graduates and diplomates are qualified for appointment to professional engineering positions in Commonwealth and State Government departments and instrumentalities, and in private industry.

The types of engineering employment available include the investigation, design, manufacture, testing, development, installation, maintenance or sales of all types of electrical and electronic plant and equipment.

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At the time of going to press the course structure for the Diploma of Building Surveying was correct as at 31st August, 1980, but subject to approval and change. The course has since been modified and restructured as a three and a half-year program, with one semester in industry. Details of the revised course are available on request from:

- Mr A.J. Miles
  Engineering Faculty Secretary 819 8281
- or
- Mr. R.B. Sandie
  Head, Department of Civil Engineering 819 8275
The various fields of electrical and electronic engineering activity include those of electric power supply and utilisation, electrical machines and appliances, electric traction, illumination engineering, communication systems, automatic control systems, electronic equipment, analogue and digital computer development and applications, and medical electronics.

The degree course gives full exemption from the entrance examinations of the Institution of Engineers Australia and the Institution of Radio and Electronic Engineers.

Degree of Bachelor of Engineering (Electrical)

The degree course is a general electrical engineering program for the first three years, with major study streams in electronics or in electrical power in years four and five. Both streams offer a choice of electives for specialised study.

Course structure

First year (1980 syllabus)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT194</td>
<td>Thinking and Communicating</td>
<td>60</td>
</tr>
<tr>
<td>CFI11</td>
<td>Applied Mechanics</td>
<td>90</td>
</tr>
<tr>
<td>EE183</td>
<td>Electrical Circuits and Devices</td>
<td>60</td>
</tr>
<tr>
<td>ME125</td>
<td>Thermodynamics and Heat Transfer</td>
<td>60</td>
</tr>
<tr>
<td>MP101</td>
<td>Engineering Drawing</td>
<td>90</td>
</tr>
<tr>
<td>MP102</td>
<td>Engineering Practices and Processes</td>
<td>60</td>
</tr>
<tr>
<td>SC194</td>
<td>Chemistry</td>
<td>90</td>
</tr>
<tr>
<td>SK194</td>
<td>Computations</td>
<td>30</td>
</tr>
<tr>
<td>SM194</td>
<td>Mathematics</td>
<td>90</td>
</tr>
<tr>
<td>SP194</td>
<td>Physics</td>
<td>90</td>
</tr>
<tr>
<td>Elective (1) from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE101</td>
<td>Civil Engineering — Structures</td>
<td>30</td>
</tr>
<tr>
<td>EE186</td>
<td>Electrical Engineering</td>
<td>30</td>
</tr>
<tr>
<td>ME165</td>
<td>Mechanical Engineering Systems</td>
<td>30</td>
</tr>
</tbody>
</table>

Second year (1980 syllabus)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE283</td>
<td>Electrical Circuits and Fields</td>
<td>120</td>
</tr>
<tr>
<td>EE285</td>
<td>Electromagnetic Devices</td>
<td>90</td>
</tr>
<tr>
<td>EE287</td>
<td>Electronics</td>
<td>120</td>
</tr>
<tr>
<td>EE257</td>
<td>Electrical Design</td>
<td>90</td>
</tr>
<tr>
<td>SP294</td>
<td>Engineering Physics</td>
<td>60</td>
</tr>
<tr>
<td>SM294</td>
<td>Mathematics</td>
<td>120</td>
</tr>
<tr>
<td>MP283</td>
<td>Engineering Materials</td>
<td>45</td>
</tr>
<tr>
<td>EE281</td>
<td>Electrical Measurements</td>
<td>30</td>
</tr>
<tr>
<td>EE282</td>
<td>Communication Principles</td>
<td>45</td>
</tr>
<tr>
<td>EE290</td>
<td>Environmental Engineering</td>
<td>15</td>
</tr>
<tr>
<td>SK294</td>
<td>Computer Programming</td>
<td>15</td>
</tr>
</tbody>
</table>

Phasing-in of 1980 degree course

To enable the phasing-in of the 1980 degree course, third year students in 1981 will undertake the third year of the 1976 syllabus, which is as follows:

Third year

Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE301</td>
<td>Industrial Experience</td>
<td></td>
</tr>
<tr>
<td>EE326</td>
<td>Engineering Administration</td>
<td></td>
</tr>
</tbody>
</table>

Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS396</td>
<td>Accounting</td>
<td>30</td>
</tr>
<tr>
<td>EE364</td>
<td>Electric Power</td>
<td>75</td>
</tr>
<tr>
<td>EE366</td>
<td>Electronics</td>
<td>90</td>
</tr>
<tr>
<td>EE368</td>
<td>Linear Control Systems</td>
<td>60</td>
</tr>
<tr>
<td>EE381</td>
<td>Environmental Engineering</td>
<td>80</td>
</tr>
<tr>
<td>SM317</td>
<td>Engineering Mathematics</td>
<td>60</td>
</tr>
<tr>
<td>SP303</td>
<td>Engineering Physics</td>
<td>30</td>
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<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third</td>
<td>360</td>
</tr>
</tbody>
</table>

Fourth year students in 1981 and 1982, who have completed the third year of the 1976 syllabus, will undertake the following program of subjects in each stream, before proceeding on to the fifth year of the 1980 syllabus.

Fourth year

Electrical power stream

Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE455</td>
<td>Electrical Design</td>
<td>45</td>
</tr>
<tr>
<td>EE463</td>
<td>Circuits and Fields</td>
<td>30</td>
</tr>
<tr>
<td>EE485</td>
<td>Electrical Power and Machines</td>
<td>90</td>
</tr>
<tr>
<td>EE486</td>
<td>Electronics and Communications</td>
<td>60</td>
</tr>
<tr>
<td>EE489</td>
<td>Control Systems</td>
<td>60</td>
</tr>
<tr>
<td>SM494</td>
<td>Engineering Mathematics</td>
<td>45</td>
</tr>
<tr>
<td>SP404</td>
<td>Engineering Physics</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE401</td>
<td>Industrial Experience</td>
<td></td>
</tr>
<tr>
<td>EE454</td>
<td>Electrical Design</td>
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</tbody>
</table>

Electronics stream

Semester 1

<table>
<thead>
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<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE457</td>
<td>Electronic Design</td>
<td>45</td>
</tr>
<tr>
<td>EE463</td>
<td>Circuits and Fields</td>
<td>30</td>
</tr>
<tr>
<td>EE487</td>
<td>Electronics and Communications</td>
<td>90</td>
</tr>
<tr>
<td>EE488</td>
<td>Electrical Power and Machines</td>
<td>60</td>
</tr>
<tr>
<td>EE489</td>
<td>Control Systems</td>
<td>60</td>
</tr>
<tr>
<td>SM494</td>
<td>Engineering Mathematics</td>
<td>45</td>
</tr>
<tr>
<td>SP404</td>
<td>Engineering Physics</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE401</td>
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<td></td>
</tr>
<tr>
<td>EE454</td>
<td>Electrical Design</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Fourth</td>
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</tbody>
</table>

<table>
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<tr>
<th>Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Fourth</td>
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</table>
Fifth year students in 1981 will undertake the fifth year of the 1980 syllabus, which is as follows:

### Fifth year
#### Electrical power stream
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE555</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>EE571</td>
<td>120</td>
<td></td>
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<tr>
<td><em>plus two from—</em></td>
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<tr>
<td>EE588</td>
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<tr>
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<tr>
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<td></td>
</tr>
<tr>
<td>EE583</td>
<td>60</td>
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</tbody>
</table>

#### Electronics stream
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE557</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>EE573</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>EE587</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td><em>plus two from—</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE586</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>EE582</td>
<td>60</td>
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<tr>
<td>EE584</td>
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<td>EE580</td>
<td>60</td>
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</tr>
<tr>
<td>EE589</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

*Certain electives in one stream may be selected by students in the other streams provided that approval is obtained from the head of the department.

For information only the proposed third and fourth years of the 1980 syllabus are as follows, and will be implemented as soon as possible.

### Third year
#### Semester 1
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE301</td>
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</table>

#### Semester 2
<table>
<thead>
<tr>
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<th>Hours</th>
<th>Semester</th>
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<td>EE387</td>
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<tr>
<td>EE383</td>
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<td>EE389</td>
<td>60</td>
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<tr>
<td>EE357</td>
<td>45</td>
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<tr>
<td>SM394</td>
<td>45</td>
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<tr>
<td>General Elective</td>
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</table>

### Fourth year
#### Electrical power stream
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE485</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>EE486</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>EE489</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>EE455</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>MP422</td>
<td>30</td>
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</tr>
<tr>
<td>SM494</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>General Elective</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

### Degree conversion program 1980 syllabus
#### For diplomates
For holders of the Swinburne 1972 Diploma of Engineering (Electrical) or Diploma of Engineering (Electronic) or equivalent, the conversion program for the Degree of Bachelor of Engineering (Electrical), 1980 syllabus is:

#### Electronics stream
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP294</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM394</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE488</td>
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</tr>
<tr>
<td>EE487</td>
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<tr>
<td>SM494</td>
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<tr>
<td>EE401</td>
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<tr>
<td>EE402</td>
<td></td>
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</tr>
<tr>
<td>EE573</td>
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<td>EE587</td>
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<tr>
<td>EE586</td>
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<tr>
<td>EE582</td>
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<tr>
<td>EE588</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE589</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Electrical power stream
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP294</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM394</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE488</td>
<td></td>
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</tr>
<tr>
<td>EE487</td>
<td></td>
<td></td>
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<tr>
<td>SM494</td>
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<tr>
<td>EE402</td>
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<tr>
<td>EE573</td>
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<td>EE587</td>
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<tr>
<td>EE586</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE582</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE588</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE589</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Certain electives in one stream may be selected by students in the other streams provided that approval is obtained from the head of the department.
Notes
1 Usually, the above program is completed in two years of part-time evening study at an average of between 11 and 12 hours per week. The subjects are also available during the day, and students may take some day and some evening classes.
2 Exemption from EE401 Industrial Experience is granted where applicants have suitable engineering experience in industry. Formal application is required for this exemption.
3 Programs for diplomates from other institutes are considered individually.

For persons who have completed courses which are not equivalent to the Swinburne 1972 Diploma of Engineering (Electrical or Electronic), special programs of study leading to the award of degree can be arranged.

Diploma of Engineering (Electrical)
Diploma of Engineering (Electronic)
From 1980 onwards there will be no full-time classes for the Diploma of Engineering (Electrical) or Diploma of Engineering (Electronic). Part-time classes for students currently enrolled will be available and it is expected that they will continue to be offered until the end of 1982.

Students re-enrolling for the current diploma course in 1981 will need to refer to the 1979 handbook for details of the program and subject requirements. Enquiries regarding part-time study programs should be directed to the head of the department.

Graduate Diploma in Digital Electronics
This part-time course is designed to provide practising engineers and scientists with the skills to assess modern digital equipment and to use it effectively in applications in their areas of speciality. The course provides a review of basic digital electronic devices and techniques as well as a detailed coverage of modern digital system design:

In keeping with the aim of the course, which is to meet needs of practising engineers and scientists, the course is application-oriented with significant emphasis on laboratory work and design experience. Each participant in the course undertakes an individual design project which may be integrated with normal work commitments under certain conditions.

To gain admission to the course, applicants usually should have a degree or diploma in electrical engineering or an allied field.

Course structure
First year
Semester 1
EE405 Semiconductor Electronics 60
EE406 Digital Logic

Second year
EE407 Switching Circuit Analysis and Synthesis 60
EE408 Input/Output Techniques 60

Graduate Diploma in Energy Systems
The purpose of this part-time course is to provide to engineers in industry, government utilities and departments a formal, structured and systematic treatment of the major issues, both technical and socio-economic, in the energy area.

In the first year of the course the emphasis is on bringing engineers from various branches to a common level and on the introduction of interdisciplinary material namely in policy, economics and environmental technology. The second year contains the bulk of the advanced technology which incorporates further aspects of policy, economics and the environment.

The course usually entails two years’ part-time evening study necessitating attendance two nights per week for four fifteen-week semesters.

To gain admission to the course, applicants should have a degree or diploma in a branch of engineering, applied science or equivalent. Those who do not meet the specific entry requirements but who have appropriate experience in the energy field may be enrolled if they can demonstrate that they can cope with and benefit from the course.

Course structure
First year
Semester 1
EE417 Electrical Technology 30
EM417 Thermal Technology 30
BS417 Energy Economics 30
AT692 Energy Policy Formation 30

Semester 2
EM424 Energy Resources and Conversion 60
EM425 Environmental Engineering 30
BS418 Energy Economics 30

Second year
Semester 1
EE515 Energy Utilisation and Conservation 60
EM524 Energy Resources and Conversion 60
Degree of Master of Engineering

Graduates who have a Bachelor’s degree following study at Swinburne or another establishment, and who have shown a high standard of academic achievement in that course, may be admitted to undertake work in the Department of Electrical and Electronic Engineering for the degree of Master of Engineering.

The higher degree programs currently available require the presentation of a major thesis based on original research, carried out either within this department or externally providing that adequate facilities and supervision can be arranged. External work can include investigatory or developmental work carried out in an approved industrial, governmental or research organisation.

The duration of the Master of Engineering course shall be not less than two years after the completion of the Bachelor’s degree.

Enquiries regarding Masters’ degree programs should be addressed to the head of the Department of Electrical and Electronic Engineering.

Courses offered

- Degree of Bachelor of Engineering (Manufacturing)
- Diploma of Engineering (Production)
- Diploma of Engineering (Chemical)
- Associate Diploma in Production Engineering
- Graduate Diploma in Chemical Engineering
- Graduate Diploma in Biochemical Engineering
- Graduate Diploma in Industrial Management
- Graduate Diploma in Manufacturing Technology
- Degree of Master of Engineering

*No longer offered to new enrolments.
†This is a para-professional course.

Career potential

Manufacturing/Production/Industrial engineering

Manufacturing engineers are associated with activities such as factory management, operation planning, tool design, production planning and control, work study, product design and quality control.

The undergraduate programs leading to the award of the Degree of Bachelor of Engineering (Manufacturing) are cooperative educational programs designed to prepare the student for a professional career in the
field of manufacturing, with particular emphasis on the engineering industries. However, because of the general applicability of the principles taught, manufacturing engineers are employed in a wide range of industries including, in addition to the engineering industries, textiles, clothing manufacture, retailing and food industries.

Developments in Australian industry, particularly towards increased productivity and the use of more sophisticated manufacturing techniques and control systems, including the use of computer based systems, indicates that for many years the demand for manufacturing engineers will exceed the number available. Opportunities exist for graduates in manufacturing engineering with a variety of backgrounds in manufacturing technology including a knowledge of the traditional metal-working processes, the growing fields associated with non-metallic, particularly plastic and ceramic, materials and a wide range of chemical processes associated with industries such as the food industry, biochemical and surface treatment industries and, in many industries, waste control and disposal.

The course is designed to provide an opportunity for students to gain experience in a variety of manufacturing technologies. Specialist streams include Manufacturing technology
Materials technology
Chemical technology.

Degree of Bachelor of Engineering (Manufacturing)
The course is a cooperative education program of four-and-a-half years' duration and is designed to provide integrated academic and industrial training.

Students may elect to complete the course by following one of three streams within the manufacturing technology and design for manufacture subjects. These streams allow students to direct their studies towards production technology, materials technology, or chemical technology.

The degree course is recognised by the Institution of Engineers, Australia, and the Institution of Production Engineers.

Course structure
The first and second year courses are shown for students entering in 1980 or later.

The course for third and subsequent years is shown for students who entered the course in 1979.

Students who entered prior to 1979 and students wishing to undertake part-time study must consult the head of department for details of modifications to courses.

First year (1980 syllabus) Hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM194</td>
<td>Mathematics</td>
<td>90</td>
</tr>
<tr>
<td>SP194</td>
<td>Physics</td>
<td>90</td>
</tr>
<tr>
<td>SC194</td>
<td>Chemistry</td>
<td>90</td>
</tr>
<tr>
<td>SK196</td>
<td>Computations</td>
<td>30</td>
</tr>
<tr>
<td>MP101</td>
<td>Engineering Drawing</td>
<td>90</td>
</tr>
<tr>
<td>MP102</td>
<td>Engineering Practices and Processes</td>
<td>60</td>
</tr>
<tr>
<td>CE111</td>
<td>Applied Mechanics</td>
<td>90</td>
</tr>
<tr>
<td>ME125</td>
<td>Thermodynamics and Heat Transfer</td>
<td>60</td>
</tr>
<tr>
<td>EE183</td>
<td>Electrical Circuits and Devices</td>
<td>60</td>
</tr>
<tr>
<td>AT194</td>
<td>Thinking and Communicating</td>
<td>60</td>
</tr>
<tr>
<td>Elective 1</td>
<td>from</td>
<td></td>
</tr>
<tr>
<td>CE101</td>
<td>Civil Engineering — Structures</td>
<td></td>
</tr>
<tr>
<td>EE186</td>
<td>Electrical Engineering</td>
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<tr>
<td>ME165</td>
<td>Mechanical Engineering Systems</td>
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</tr>
<tr>
<td>MP191</td>
<td>Manufacturing Engineering</td>
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Second year (1980 syllabus) Hours

<table>
<thead>
<tr>
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<th>Course Name</th>
<th>Hours</th>
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</thead>
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<tr>
<td>SA296</td>
<td>Physical Science</td>
<td>60</td>
</tr>
<tr>
<td>ME219</td>
<td>Applied Mechanics</td>
<td>150</td>
</tr>
<tr>
<td>AT293</td>
<td>Liberal Studies</td>
<td>45</td>
</tr>
<tr>
<td>SK296</td>
<td>Computer Programming</td>
<td>15</td>
</tr>
<tr>
<td>EE284</td>
<td>Electronic Circuits and Devices</td>
<td>60</td>
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<tr>
<td>MP251</td>
<td>Design for Manufacture</td>
<td>90</td>
</tr>
<tr>
<td>MP211</td>
<td>Manufacturing Technology</td>
<td>90</td>
</tr>
<tr>
<td>MP281</td>
<td>Engineering Materials</td>
<td>90</td>
</tr>
<tr>
<td>MP231</td>
<td>Industrial Engineering</td>
<td>30</td>
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</tbody>
</table>

Third year (1975 syllabus)

<table>
<thead>
<tr>
<th>Semester 5</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP305</td>
<td>Work Experience</td>
<td>54</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 6 (18 weeks)</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE323</td>
<td>Electronics</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>EM312</td>
<td>Applied Mechanics</td>
<td>59</td>
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</tr>
<tr>
<td>EM314</td>
<td>Applied Mechanics</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>EP356</td>
<td>Design for Manufacture</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>EP315</td>
<td>Production Technology</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>EP321</td>
<td>Engineering Administration</td>
<td>54</td>
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</tr>
<tr>
<td>SM305</td>
<td>Mathematics</td>
<td>54</td>
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</table>

Fourth year (1975 syllabus)

<table>
<thead>
<tr>
<th>Semester 7 (18 weeks)</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK427</td>
<td>Computer Applications</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>GS493</td>
<td>General Studies</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>EP325</td>
<td>Industrial Management</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>EP335</td>
<td>Industrial Engineering</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>EP355</td>
<td>Design for Manufacture</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>SM402</td>
<td>Mathematical Methods</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>EP434</td>
<td>Systems Engineering</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>EP415</td>
<td>Production Technology</td>
<td>63</td>
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</table>

450

Materials technology stream

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK427</td>
<td>Computer Applications</td>
<td>45</td>
</tr>
<tr>
<td>GS493</td>
<td>General Studies</td>
<td>45</td>
</tr>
</tbody>
</table>
Faculty of Engineering

EP325  Industrial Management  54  Fifth year  General Elective
EP335  Industrial Engineering  54  MP531  Industrial Engineering
EP355  Design for Manufacture  90  MP521  Industrial Management
SM402  Mathematical Methods  45  MP501  Manufacturing Project
MT415  Materials Technology  117  MP551  Design for Manufacture — P
                                      or  MP511  Manufacturing Technology — P
                                      or  MP552  Design for Manufacture — M
                                      or  MP512  Manufacturing Technology — M
                                      or  MP553  Design for Manufacture — C
                                      or  MP513  Manufacturing Technology — C

Semester 8
EP402  Work Experience

Fifth year (1975 syllabus)

Semester 9 (18 weeks)
Production technology stream

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP525</td>
<td>Industrial Management</td>
<td>54</td>
</tr>
<tr>
<td>EP535</td>
<td>Industrial Engineering</td>
<td>54</td>
</tr>
<tr>
<td>EP555</td>
<td>Design for Manufacture</td>
<td>90</td>
</tr>
<tr>
<td>EP515</td>
<td>Production Technology</td>
<td>63</td>
</tr>
<tr>
<td>EP526</td>
<td>Elective</td>
<td>45</td>
</tr>
<tr>
<td>EP556</td>
<td>Manufacturing Systems</td>
<td>144</td>
</tr>
</tbody>
</table>

Materials technology stream

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP525</td>
<td>Industrial Management</td>
<td>54</td>
</tr>
<tr>
<td>EP535</td>
<td>Industrial Engineering</td>
<td>54</td>
</tr>
<tr>
<td>EP555</td>
<td>Design for Manufacture</td>
<td>94</td>
</tr>
<tr>
<td>MT515</td>
<td>Materials Technology</td>
<td>252</td>
</tr>
</tbody>
</table>

450

*Note: One week assignment at end of course — 36 hours included.

For information only — the proposed later years of the 1980 syllabus are as follows and will be implemented as soon as possible.

Degree conversion program — 1980 syllabus

For diplomas

For holders of the Diploma of Engineering (Production) from Swinburne, or an equivalent diploma, the subjects required in the degree conversion program are:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP315</td>
<td>Production Technology</td>
</tr>
</tbody>
</table>

All subjects of the fourth and fifth year of the degree course (1975 syllabus) except EP335 Industrial Engineering.

Notes

1. Usually the above program is completed in two years of part-time evening study at an average of between 11 and 12 hours per week. The subjects are also available during the day and students may take some day and some evening classes.
2. Exemption from industrial experience is granted where applicants have suitable engineering experience in industry. Formal application is required for this exemption.
3. Diplomates from other institutes will be considered individually.

Diploma of Engineering (Production)

Students wishing to complete the diploma should note that full-time classes for the final semester of the course (semester 7) were offered for the last time in the first half of 1980. It is anticipated that diploma subjects will continue to be offered on a part-time basis until and including 1982.

Part-time students re-enrolling for the diploma should refer to the 1979 handbook for details of the program and subject requirements. Enquiries regarding part-time study programs should be directed to the head of department.

Students who entered first year in 1976 or earlier should consult the head of department for details of course modifications.
Associate Diploma in Production Engineering
The purpose of this course is to provide job-oriented studies to suit the needs of students, employers and also to serve public interest. It is a para-professional course which leads to a middle-level vocation in which the graduate will have contact with a large variety of people within manufacturing industry. The course provides a basic grounding in engineering science and technology appropriate to manufacturing and includes basic studies in aspects of industrial engineering, management, and manufacturing technology appropriate to many middle-level supervisory functions in industry.

Course structure
This course may be taken in either the cooperative format (one year institute, one year industry, followed by one year institute) or as a part-time course involving some day release and evening studies.

Cooperative format

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC113 Engineering Science – Chemistry</td>
<td>60</td>
</tr>
<tr>
<td>MP181 Engineering Science – Materials</td>
<td>60</td>
</tr>
<tr>
<td>EE139 Engineering Principles – Electricity</td>
<td>60</td>
</tr>
<tr>
<td>ME119 Engineering Principles – Mechanics</td>
<td>60</td>
</tr>
<tr>
<td>ME129 Engineering Principles – Heat</td>
<td>30</td>
</tr>
<tr>
<td>MP105 Engineering Tutorial</td>
<td>90</td>
</tr>
<tr>
<td>MP104 Engineering Drawing and Graphics</td>
<td>120</td>
</tr>
<tr>
<td>SM113 Engineering Mathematics</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>720</td>
</tr>
</tbody>
</table>

Graduate Diploma in Chemical Engineering
This is a two-year, part-time course intended to provide the basic knowledge of chemical engineering for graduates in either applied science or engineering who are working or intend to work in the chemical industries. The course is planned to be completed in two years of 3 x 3-hour evenings per week throughout the academic year of thirty weeks.

Course structure

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA319 Chemical Engineering</td>
<td>135</td>
</tr>
<tr>
<td>EA332 Instrumentation and Control Engineering</td>
<td>45</td>
</tr>
<tr>
<td>EA353 Process Plant Design and Economic Evaluation</td>
<td>60</td>
</tr>
<tr>
<td>EA355 Project Thesis and Technical Report Writing</td>
<td>90</td>
</tr>
<tr>
<td>SC327 Chemistry</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>405</td>
</tr>
</tbody>
</table>

Note
EA319/320 includes Chemical Engineering 11A, 11B and 11C (1/3 total time each).
EA355/356 Project Thesis and Technical Report Writing has the technical report writing in semester 1 only (amounting to a total of 30 hours).

Diploma of Engineering (Chemical)
No new enrolments are being accepted in this course. Details of the program and subject requirements for the first two years of the course are given in the 1980 handbook. Enquiries regarding part-time study programs should be directed to the head of the manufacturing engineering department.

Graduate Diploma in Biochemical Engineering
This is a course designed specifically for graduates in chemical engineering who are working in such areas as the food industry, processing of natural products, antibiotics and biological waste treatment. Suitable
options are, however, available for biochemists and microbiologists who are interested in the engineering aspects of biological processes.

The course is scheduled to be undertaken over two years by 3 x 3-hour evenings per week over a thirty-week teaching year. Laboratory work is provided in all subjects but is not obligatory in engineering biochemistry.

Course structure

<table>
<thead>
<tr>
<th>First year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC571 Biology</td>
<td>90</td>
</tr>
<tr>
<td>EA411 Non-Newtonian Heat Mass and Momentum Transfer</td>
<td>90</td>
</tr>
<tr>
<td>SC582 Engineering Biochemistry</td>
<td>90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC572 Microbiology</td>
<td>90</td>
</tr>
<tr>
<td>SC583 Physical Biochemistry</td>
<td>60</td>
</tr>
<tr>
<td>EA491 Biochemical Engineering</td>
<td>90</td>
</tr>
</tbody>
</table>

Biochemists or similar who have covered appropriate parts of the course could attend the corresponding course offered in chemical engineering.

Graduate Diploma in Industrial Management

Part-time course

Entrance to this evening course is limited strictly to those who have already completed a recognised subject of scientific training, such as a degree or diploma. This course is intended to meet the needs of people who wish to equip themselves for managerial responsibility in industry. Throughout the course, the greatest possible use will be made of the scientific and mathematical knowledge acquired by students in their original courses.

The course comprises four compulsory subjects and three optional subjects. Students may be granted credit for any two of the subjects offered, on the basis of prior study. Where a student has grounds for credit in EP421, 423 or 424 but has already received maximum credit, permission may be given to substitute another optional subject in lieu of the compulsory one.

Admission is determined by a selection committee and applicants are advised to complete the prescribed application form and attach details and evidence of qualifications and work experience.

This course is of approximately three years' duration, part-time.

Preliminary reading


An introductory subject — EP422 — is offered.

EP422 Engineering administration - evolution and nature. (Exemptions in this subject will be granted to students who have already passed an equivalent subject or whose previous training and industrial background make the subject unnecessary.

Compulsory subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP421 Applied Statistics and Operations</td>
<td>60</td>
</tr>
<tr>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>EP423 Financial Aspects of Industrial</td>
<td>60</td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>EP424 Human Relations in Industry</td>
<td>60</td>
</tr>
<tr>
<td>EP426* Management Practice</td>
<td>90</td>
</tr>
</tbody>
</table>

*Management practice is taken in the final year of the course

Optional subjects (three to be taken)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP425 Legal Aspects of Industrial Management</td>
<td>60</td>
</tr>
<tr>
<td>EP431 Production Management</td>
<td>60</td>
</tr>
<tr>
<td>EP432 Work Study</td>
<td>60</td>
</tr>
<tr>
<td>SK527 Computing Techniques</td>
<td>60</td>
</tr>
<tr>
<td>EP435 Physical Distribution Management</td>
<td>60</td>
</tr>
<tr>
<td>EP436 Environment Studies</td>
<td>60</td>
</tr>
</tbody>
</table>

Note

In any year, an optional subject may not be offered unless staff are available — and a sufficient number of students elect to enrol for the subject.

Graduate Diploma in Manufacturing Technology

This course is designed to increase the effectiveness of engineers, scientists and technologists who hold positions in industry or public service and find themselves ill-equipped to function efficiently in a changing manufacturing environment.

The course provides a sound understanding of current manufacturing technology, up-to-date techniques of acquiring information, an understanding of the latest scientific methods and training and practice in engineering communication.
The course is arranged to be taken part-time over two years. The lecture or class time is 450 hours: compulsory subjects of 270 hours; and 180 hours of optional subjects. Not more than 120 hours of optional subjects may be taken from group 1.

Candidates for admission should be 24 years of age, hold a diploma or degree in engineering or science and two years' industrial experience. Applicants without the formal requirement but who have had considerable relevant experience in manufacturing will be considered.

Course structure

**Compulsory subjects**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP611</td>
<td>Metal-working Technology 90</td>
</tr>
<tr>
<td>EP612</td>
<td>Polymer Processing Technology 90</td>
</tr>
<tr>
<td>EP613</td>
<td>Manufacturing Systems 90</td>
</tr>
</tbody>
</table>

**Optional subjects**

**Group 1** (Not more than 120 hours to be taken)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP431</td>
<td>Production Management 60</td>
</tr>
<tr>
<td>EP432</td>
<td>Work Study 60</td>
</tr>
<tr>
<td>EP436</td>
<td>Environment Studies 60</td>
</tr>
<tr>
<td>SK527</td>
<td>Computing Techniques 60</td>
</tr>
</tbody>
</table>

**Group 2**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP621</td>
<td>Experimental Design and Instrumentation 60</td>
</tr>
<tr>
<td>EP622</td>
<td>Industrial Health 30</td>
</tr>
<tr>
<td>EP624</td>
<td>Oxide Technology — Glass 30</td>
</tr>
<tr>
<td>EP625</td>
<td>Oxide Technology — Ceramic and Refractory 30</td>
</tr>
<tr>
<td>EP626</td>
<td>Sheet Metal Technology 30</td>
</tr>
<tr>
<td>EP627</td>
<td>Low Cost Automation 30</td>
</tr>
<tr>
<td>EP628</td>
<td>Quality and Reliability Engineering 30</td>
</tr>
</tbody>
</table>

**Degree of Master of Engineering**

Graduates who have a Bachelor's degree following study at Swinburne or another establishment, and who showed a high standard of academic achievement in that course, may be admitted to undertake work in the Department of Manufacturing Engineering for the degree of Master of Engineering.

The higher degree programs currently available require the presentation of a major thesis based on original research, carried out either within this department or externally, providing that adequate facilities and supervision can be arranged. External work can include investigatory or developmental work carried out in an approved industrial, governmental or research organisation.

The duration of the Master of Engineering course shall be not less than two years after the completion of the Bachelor's degree.

Enquiries regarding both types of Master's degree programs should be addressed to the head of the Department of Manufacturing Engineering.

**Department of Mechanical Engineering**

The degree courses provide a thorough education in the application of engineering science principles and combine with this a broad span of studies, important to a professional engineer, such as economics, psychology, human engineering, administration, and communication techniques. Students work in modern buildings where the facilities available include laboratories, design rooms, seminar rooms, library study areas, engineering workshop and digital, analogue and hybrid computers. There is a strong emphasis on the teaching approach and use of tutorial and laboratory work. The mentor scheme which operates in the mechanical engineering department provides each student with a ready source of advice on any aspect of course or career.

To qualify for the degree each student must complete two periods of approved industrial experience supervised by institute and industry engineers, and arranged in the third and fourth years of study.

The cooperative industrial experience in the amended course amounts to 48 weeks. The experience gained is of considerable value in providing opportunities to learn from practising engineers and in helping to consolidate the more formal theoretical work undertaken in the institute. The mechanical engineering department gratefully acknowledges the assistance of engineers in many companies and government departments whose support has greatly enhanced the value of these periods of industrial experience.

Courses offered

- Degree of Bachelor of Engineering (Mechanical)
- Diploma of Engineering (Mechanical)
- Degree of Master of Engineering
- Graduate Diploma in Air-Conditioning
- Graduate Diploma in Maintenance Engineering
- Post-diploma Studies — Creative Engineering
- Post-diploma Studies — Human Engineering

†No longer offered to new enrolments.

**Career potential**

Mechanical engineering may be defined as a profession in which a knowledge of mathematical and natural sciences gained by study, experience and practice is applied, with judgement and regard for the conservation of natural order, to develop ways to use for the benefit of mankind, the material and energy resources available.

Excellent career opportunities exist in mechanical engineering for women as for men. Overseas there are many women mechanical engineers. In Australia there are still relatively few but they are very successful.
Faculty of Engineering

Degree of Bachelor of Engineering (Mechanical)
The degree course program combines a thorough education in the application of engineering science principles with a broad span of studies important to a professional engineer.

Streaming in later years of the course is offered through a system of technical elective subjects which allow students to select a particular emphasis for their four-and-a-half-year cooperative education program.

Degree course revision
Students entering the first year of the mechanical engineering course in 1981 will be enrolled in the common first year of the cooperative course which is being phased in from 1980.

The existing Bachelor of Engineering (Mechanical) 1971 course will continue to be offered during the transition.

Courses are arranged to allow flexibility so that any student may transfer from full-time to part-time studies or vice versa, at particular points of a course, without loss of credit for subjects passed.

Those who have reached diploma standard and are now engaged in industry may continue to proceed by part-time day release and evening work to the degree of Bachelor of Engineering (Mechanical).

Course structure

Cooperative structure (1980 syllabus)

First year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT194</td>
<td>Thinking and Communicating</td>
<td>60</td>
</tr>
<tr>
<td>EE111</td>
<td>Applied Mechanics</td>
<td>90</td>
</tr>
<tr>
<td>EE183</td>
<td>Electrical Circuits and Devices</td>
<td>60</td>
</tr>
<tr>
<td>ME125</td>
<td>Thermodynamics and Heat Transfer</td>
<td>60</td>
</tr>
<tr>
<td>MP101</td>
<td>Engineering Drawing</td>
<td>90</td>
</tr>
<tr>
<td>MP102</td>
<td>Engineering Practices and Processes</td>
<td>90</td>
</tr>
<tr>
<td>SCI94</td>
<td>Chemistry</td>
<td>90</td>
</tr>
<tr>
<td>SK194</td>
<td>Computations</td>
<td>30</td>
</tr>
<tr>
<td>SM194</td>
<td>Mathematics</td>
<td>90</td>
</tr>
<tr>
<td>SP194</td>
<td>Physics</td>
<td>90</td>
</tr>
</tbody>
</table>

Second year (1980 syllabus)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE101</td>
<td>Civil Engineering — Structures</td>
<td>30</td>
</tr>
<tr>
<td>EE186</td>
<td>Electrical Engineering</td>
<td></td>
</tr>
<tr>
<td>ME165</td>
<td>Mechanical Engineering Systems</td>
<td></td>
</tr>
<tr>
<td>MP191</td>
<td>Manufacturing Engineering</td>
<td></td>
</tr>
</tbody>
</table>

Elective (1) from

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS294</td>
<td>Managerial Economics</td>
<td>30</td>
</tr>
<tr>
<td>ME271</td>
<td>Design for Industry</td>
<td>90</td>
</tr>
<tr>
<td>ME272</td>
<td>General Elective</td>
<td>45</td>
</tr>
</tbody>
</table>

Students may undertake only one general study elective subject offered by other faculties under the title ‘General Elective’. The other subjects are obligatory.

Syllabuses for first and second year subjects are given in the following section ‘Subject details’.

Third year (1971 syllabus)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM405</td>
<td>Engineering Physical Science</td>
<td></td>
</tr>
<tr>
<td>EM406</td>
<td>Industrial Technology</td>
<td>220</td>
</tr>
<tr>
<td>EM465</td>
<td>Engineering Art and Behavioural Science</td>
<td>40</td>
</tr>
</tbody>
</table>

Fourth year (1971 syllabus)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM405</td>
<td>Engineering Physical Science</td>
<td></td>
</tr>
<tr>
<td>EM406</td>
<td>Industrial Technology</td>
<td>310</td>
</tr>
<tr>
<td>EM465</td>
<td>Engineering Art and Behavioural Science</td>
<td>40</td>
</tr>
</tbody>
</table>

The third and fourth years of the degree course each comprise thirty weeks of formal studies in the institute and at least ten weeks working in industry in engineering activities guided by industry-based engineers and members of the department staff.

Syllabuses for third and fourth year subjects are listed below. For first and second year subjects (1971 syllabuses) refer to 1979 handbook.

For information only, the third and fourth years of the 1980 syllabus course are as follows, and will be implemented as soon as possible.
Cooperative course (1980 syllabus)

Third year
Semesters 5 and 6

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM398 Mathematics</td>
<td>45</td>
<td>Year</td>
</tr>
<tr>
<td>ME311 Applied Mechanics</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>ME321 Energy Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME331 Instrumentation and Control Systems</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>ME341 People-Environment Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>MP314 Manufacturing Technology</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME371 Design for Industry</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME391 Industrial Experience</td>
<td>840</td>
<td></td>
</tr>
</tbody>
</table>

All subjects are obligatory.

Fourth year
Semesters 7 and 8

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM398 Mathematics</td>
<td>45</td>
<td>Year</td>
</tr>
<tr>
<td>ME411 Applied Mechanics</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>ME421 Energy Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME431 Instrumentation and Control Systems</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>BS498 Decision Analysis and Financial Management</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>MP484 Engineering Materials</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>ME441 People-Environment Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME451 Technical Planning and Sales Engineering</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>ME471 Design for Industry</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME481 Engineering Investigation</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME491 Industrial Experience</td>
<td>840</td>
<td></td>
</tr>
</tbody>
</table>

Any three of the following six subjects, including at least one of ME551, ME552 and BS599.

All subjects are obligatory.

Fifth year
Semester 9

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM598 Mathematics</td>
<td>45</td>
<td>Year</td>
</tr>
<tr>
<td>ME511 Applied Mechanics</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>ME521 Energy Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME531 Instrumentation and Control Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME551 Decision Analysis and Financial Management</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME561 Engineering Plant and Equipment</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME552 Plant Information Systems</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>BS599 Marketing, Law and Technological Forecasting</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME581 Cooperative Project</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>General Elective</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>375</td>
<td>1.215</td>
</tr>
</tbody>
</table>

Notes
1. This program may be completed in two years of part-time study evening and/or day at an average rate of between 11 and 12 hours/week formal contact time.
2. Exemption from ME491 Industrial Experience is granted where applicants have suitable industrial experience. Formal application is required for this exemption.
3. Diplomates from other institutes are considered individually.

Degree conversion program — 1980 syllabus

For diplomas

For diplomas who have completed the Swinburne 1972 course for the Diploma of Engineering (Mechanical), or its equivalent, the conversion program for the Degree of Bachelor of Engineering in Mechanical Engineering, 1980 syllabus is:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM398 Mathematics</td>
<td>45</td>
<td>Year</td>
</tr>
<tr>
<td>ME331 Instrumentation and Control Systems</td>
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<td></td>
</tr>
<tr>
<td>SM498 Mathematics</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ME411 Applied Mechanics</td>
<td>75</td>
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</tr>
<tr>
<td>ME431 Instrumentation and Control Systems</td>
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<td>ME441 People-Environment Systems</td>
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<tr>
<td>BS498 Decision Analysis and Financial Management</td>
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<td>ME451 People-Environment Systems</td>
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</tr>
<tr>
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<td>45</td>
<td></td>
</tr>
<tr>
<td>ME491 Industrial Experience</td>
<td>840</td>
<td></td>
</tr>
</tbody>
</table>

Any three of the following six subjects, including at least one of ME551, ME552 and BS599.

Students may undertake any two of the technical electives SM498, MP484, ME451 and MP414, including at least one of BS498 and ME451. The other subjects are obligatory.

Diploma of Engineering (Mechanical)

From 1980 onwards there will be no full-time classes for the Diploma of Engineering (Mechanical). Part-time classes for students currently enrolled will be available and it is expected that they will continue to be offered until the end of 1982.

Students re-enrolling for the current diploma course in 1981 will need to refer to the 1979 and 1980 handbooks for details of diploma subjects and subject equivalents.

Enquiries regarding part-time study programs should be directed to the head of department.

Graduate Diploma in Air-conditioning

This part-time course is designed for those who have a qualification such as a diploma or degree in engineering or applied science, and who wish to take advanced studies based on applied thermodynamics and controls. The course consists of six subjects...
which are usually taken by evening attendance over a period of three years.

The subjects involved are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM421</td>
<td>Process Heating</td>
<td>60</td>
</tr>
<tr>
<td>EM441</td>
<td>Air-conditioning I</td>
<td>90</td>
</tr>
<tr>
<td>EM442</td>
<td>Air-conditioning II</td>
<td>90</td>
</tr>
<tr>
<td>EM443</td>
<td>Refrigeration I</td>
<td>90</td>
</tr>
<tr>
<td>EM444</td>
<td>Refrigeration II</td>
<td>90</td>
</tr>
<tr>
<td>EM451</td>
<td>Project Work</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>540</td>
</tr>
</tbody>
</table>

**Graduate Diploma in Maintenance Engineering**

This part-time course is designed for those who have a qualification such as a diploma or degree in engineering and who wish to take advanced studies based on maintenance engineering and its interaction with industry in general. The course consists of four subjects taken by evening attendance usually spread over two years. The subjects are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM506</td>
<td>Maintenance Planning and Control</td>
<td>90</td>
</tr>
<tr>
<td>EM507</td>
<td>Maintenance Engineering I</td>
<td>120</td>
</tr>
<tr>
<td>EM508</td>
<td>Maintenance Engineering II</td>
<td>120</td>
</tr>
<tr>
<td>EM505</td>
<td>Materials and Processes</td>
<td>90</td>
</tr>
</tbody>
</table>

People who have experience in the maintenance field but not the prerequisite qualifications may be enrolled if they can demonstrate that they have an adequate background and are able to cope with the course. Assessment is continuous throughout the course.

**Creative Engineering and Human Engineering**

These part-time subjects are designed for those who have a qualification such as a diploma or degree in engineering or applied science and who wish to take advanced studies in aspects of creative problem-solving and brainstorming techniques, or in human factors. These are relatively new and important areas in engineering.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM461</td>
<td>Creative Engineering</td>
<td>90</td>
</tr>
<tr>
<td>EM462</td>
<td>Human Engineering</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>210</td>
</tr>
</tbody>
</table>

**Master of Engineering**

Engineering graduates who wish to proceed to the degree of Master of Engineering are invited to discuss their research interests with members of the mechanical engineering department staff. In the first instance, enquiries should be addressed to the head of the mechanical engineering department.

Research projects are available in any of the recognised areas of mechanical engineering with emphasis in general on projects biased towards industrial applications. Some emphasis occurs at
This section contains a brief description of the various subjects taught in engineering courses.

Some of these courses are at present being revised and it is important to look for the correct prefix (e.g., AT or GS in Liberal Studies) where it is listed in the particular course structure at the beginning of each section on engineering.

Students who commenced an undergraduate degree or diploma course in 1979 or earlier may find that details of some of their subjects are not listed in this handbook. Where this occurs students should refer to the 1979 edition of the handbook.

It should be noted that details of subjects taught by engineering departments to students in other courses (e.g., environmental health diploma which is offered by the Applied Sciences Faculty) are given in the handbook of the Faculty offering the course.

Subjects in this section are grouped in numerical order within the following codes:

Code Department or faculty
AT Liberal Studies
BS Business
CE Civil Engineering
EE Electrical and Electronic Engineering
EN Engineering Faculty
EM Mechanical Engineering
GS Liberal Studies
ME Mechanical Engineering
MP Manufacturing Engineering
SA Applied Science Faculty
SC Chemistry
SK Computer Studies
SM Mathematics
SP Physics

Subjects with the following codes are also taught within the Department of Manufacturing Engineering:
EA Chemical Engineering
EP Production Engineering
MT Materials Technology

AT194 Thinking and Communicating

Two hours per week for two semesters
Assessment is continuous

A first-year subject in all degree courses in engineering. The subject is designed to develop students' skills in communicating through the spoken and written word. Students are expected to master basic thinking processes used in the analysis and synthesis of selected material appropriate to the engineering profession. Creative thinking and decision-making as they relate to engineering also form a part of the process of developing communicating skills. A segment of the subject matter is concerned with the development of personal and social awareness, as part of the communicative process.

Preliminary reading
There is no prescribed preliminary reading

AT293 Liberal Studies

Three hours per week for one semester
Assessment is continuous

A second-year subject in the degree course in manufacturing engineering.

The aim of this subject is to introduce students to the various concepts surrounding employment in a modern industrial society. As a result of this introduction, students become aware of the necessity for an interdisciplinary approach to industrial affairs.

Areas to be covered in this course are:
- Industry: personal and interpersonal communication skills applied to the work situation and applied to community relations. Influence of physical setting in communication.
- Behaviour of work groups: use of learning theories in acquiring new behaviours and modifying existing behaviours. Physiological factors in our sense of well-being — stress, anxiety, drugs and food.
- Minority groups in industry: groups which are affected by technological change, the unemployed, migrant women.
- Industrial democracy: decision-making, worker participation, industrial conflict and the ways to resolve conflict, and trade unions.

Basic requirements are active participation in a seminar-type class setting and thorough knowledge of the textbook.

Textbook

AT691 Urban Sociology

Three hours per week for one semester
Assessment is continuous

A subject in the graduate diploma course in urban systems. This seminar course involves an introduction to sociological concepts, particularly theory of social stratification. Emphasis is placed on the relationships between social structure and some aspects of inequality in Australian cities. There will also be discussion of the relevance of social science to some areas of public policy, e.g., poverty, housing, transport.

Recommended reading

BS294 Managerial Economics
One hour per week for two semesters
A second year subject in the degree course in mechanical engineering aimed at introducing the basic concepts and terminology of economics as used in business decision making.
Among the concepts to be examined are demand analysis and forecasting, cost and output relationships, firms’ objectives and pricing strategies, investment analysis, the structure of the Australian economy and the influence of government on economic activity.
References
Lowes, B. and Sparkes, J.R. Modern Managerial Economics. Lond., Heinemann, 1974

BS396 Accounting
Two hours per week for one semester
A third-year subject in the degree course in electrical engineering (1976 syllabus).
The aim of this subject is to develop and integrate concepts and principles of accounting where they assist management decision-making and policy formation within the firm.
Topics will include: accounting and communication, financial reports, assessment of business performance, budgeting, cost control, and taxation implications.
References
Students will not be required to purchase a text but will be referred to extensive reading guides throughout the course.

BS417 Energy Economics
Two hours per week for one semester
A subject in the graduate diploma course in energy systems which is concerned with the economic principles which influence the demand, supply and pricing of energy resources.
Topics include: market mechanism and resource use; elasticity of demand; the projection of energy demands; production and cost in the short and long run; objectives of public and private enterprises; pricing strategies of public and private enterprises.
References
Lipsey, R.G. An Introduction to Positive Economics. Lond., Weidenfeld and Nicolson, 1975

BS418 Energy Economics
Two hours per week for one semester
A subject in the graduate diploma course in energy systems aimed at equipping students with the economic principles which underlie efficient investment decisions.
Topics it will cover include: economic analysis and investment systems decisions; interaction of demand, pricing and investment analysis; methods of investment appraisal; internal rate of return versus net present value; cost of capital; capital rationing; risk and uncertainty; community welfare and investment analysis — the rationale and methodology of social cost-benefit analysis; government policy and energy markets, e.g. resource taxes and mineral production subsidies.
References
Reed, P.W. The Economics of Public Enterprise. Lond., Butterworths, 1973
Rees, R. Public Enterprise Economics. Lond., Weidenfeld and Nicolson, 1976

BS661 Urban Economics
Three hours per week for one semester
A subject in the graduate diploma course in urban systems.
Topics covered will include: macro-economics and micro-economics; supply and demand theory; urban location and urban growth theory. Cost-benefit analysis applied to urban problems; transport economics and environmental economics; fiscal problems of urban government and urban renewal.
References
Harrison, A.J. Economics and Land Use Planning. Lond., Croom Helm, 1977

BS762 Transport Economics
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems.
Topics covered will include the following: economic analysis and the transport sector; determinants and characteristics of the demand for transport infrastructure and services; the cost of supplying transport services; private and social costs; the economics of transport pricing; the rationale of transport regulation — private versus public passenger transport, road versus rail freight transport etc; techniques for the economic evaluation of transport projects (cost-benefit analysis; cost-effectiveness, goals achievement matrix, planning balance sheet); case studies in project analysis.
References

CE101 Civil Engineering Elective — Structures
Two hours per week for one semester

An elective subject in the first year of all engineering degree courses which introduces students to concepts of structural behaviour in natural and man-made assemblages using a non-mathematical approach.

CE111 Applied Mechanics
Three hours per week for two semesters

A first-year subject in all degree courses in engineering, which develops in students an understanding of the basic principles of statics and dynamics and extends these concepts to the behaviour of loaded members and simple systems.

Basic concepts: kinematics, dynamics, loads, equilibrium, internal forces, superposition, energy, power, friction.
Stress and strain: general relationships, linear elastic parameters.

Performance of loaded members: statically determinate tension members, beams, long and short columns, circular shafts, simple connections.

Kinematic and loaded performance: levers, screws, belt and chain drives, pulleys and cable systems.

CE211 Structural Mechanics
Three hours per week for two semesters

A subject in the second year of the degree course in civil engineering which develops in students an understanding of the principles of mechanics as applied to structures.

After completing the subject students should be competent to analyse statically determinate planar structures and statically indeterminate beams.

Stress and Strain: biaxial loading, principal stresses, Mohr circles for stress and strain, St Venant's principle and stress concentrations.

Performance of loaded members: torsion — elastic stresses and deflections for simple shafts (circular and thin-walled closed tube sections).

Bending: internal forces, flexural stresses, shear centre, skew bending, composite sections, inelastic bending, bending deflections (D.E., moment-area, superposition).
Virtual work: concepts, deflections of struts and ties, beams and simple shafts.

Statically-determinate structures: stability, determinacy, forces and displacements of beams, simple trusses and frames. Influence lines for beams.

Statically indeterminate beams: force and displacement (slope-deflection) methods. Matrix notation.

Columns: short struts, long columns (Euler, Secant).

CE231 Hydraulics
Three hours per week for two semesters

A subject in the second year of the degree course in civil engineering which develops in students an understanding of the principles of fluid mechanics. At the end of the course students should be able to analyse a wide range of simple water engineering problems.

Statics: pressure, thrust, buoyancy, stability of floating bodies.
Kinematics: continuity, Bernoulli equation. Orifices, weirs, sluices.
Momentum: forces on fittings, jet impact.

CE241 Surveying
Two hours of theory per week for two semesters and three hours of practical work for twenty weeks

A subject in the second year of the degree course in civil engineering which enables students to use basic surveying and computation methods and instrumentation in engineering practice.

Introduction: principles and types of surveys, error classification and sources, detail surveys, plotting procedures and plan layout.
Distance measurement: chaining equipment, procedures and reductions. Principles and use of electronic distance measurement.
Levelling: construction, use and adjustment of level types, booking and reduction of levels. Contour properties, plotting and use of contour plans.
Theodolites: construction, use and adjustments of theodolites, traversing, angle reading methods, setting out of works.
Computations: computation techniques and electronic calculator use. Computations related to traverse reductions, missing parts determination, subdivision of land, road intersections and areas of various figures, circular curves, setting out, using deflection angles and tangent offsets.
Practical work: exercises related to all aspects of theory, in particular levelling and theodolite use.

CE251 Structural Design
Four hours per week for two semesters

A subject in the second year of the degree course in civil engineering which introduces students to the concepts and methods of engineering design and shows how structural principles are applied to the design of structural elements and simple civil engineering structures.

Basic studies: the design process, considerations affecting designs, design codes.
Structural loads: types of loads, loading codes.
Reinforced concrete: elastic and ultimate strength theories for rectangular beams, one-way slabs, tee beams, columns, footings.
Steel: properties, fabrication, erection, codes, structural elements and assemblies, ties, beams, columns, connections.
Timber: properties, codes, design of members and connections.
Design studies: applications of theory and design codes to the design of structural members, connections and simple assemblies.

**CE261 Transport Engineering**
Three hours per week for one semester

A subject in the second year of the degree course in civil engineering which introduces students to the engineering aspects of that branch of transportation engineering concerned with road traffic. Upon completion of the subject students will have gained a broad understanding of the highway and traffic elements which constitute the road system.

Traffic engineering: basic studies and surveys, traffic control devices, principles of intersection design.
Design of roads and streets: cross-section, grading and crossfall, vertical and horizontal curves, drainage, erosion control.
Stabilisation: mechanical, lime, cement and bituminous stabilisation of the various soil types.
Earthworks: embankment and cutting, lead and haul, mass diagram, balancing of earthwork, compaction, field determination and control of densities, brief treatment of types and uses of earthmoving equipment.
Roadmaking materials: roadstones, quarrying and crushing methods, shovels, production, types and uses of bituminous materials, bituminous treatments.
Road pavements: structures of roads, distinction between rigid mud flexible pavements, stage construction, construction of gravel and F.C.R. pavements, design of flexible pavements using CBR data.
Introduction to transportation planning.

**CE281 Geoscience**
Three hours per week for two semesters

A subject in the second year of the degree course in civil engineering which aims to develop an understanding of the fundamental principles of geology and soil mechanics and to apply these to simple applications in engineering.

Geology (50 hours)
Significance of geology in civil engineering; principles of mineralogy, petrology and palaeontology; structural geology, including deformed rocks; geomorphology, including ground water; outline of Victorian stratigraphy; elementary applications of the above topics to civil engineering; practical work in mineral and rock identification, geological mapping and determination of sequence of geological events, and excursions.

Soil mechanics (40 hours)
General soil types, classification, compaction, soil stresses and chemistry. Soil hydraulics including permeability and flow nets; shear strength of sands and clays, Mohr's circle, direct shear and triaxial shear testing; earth pressures including active, passive and at rest, rigid and flexible walls.

**CE311 Structural Mechanics**
Three hours per week for one semester

A subject in the third year of the degree course in civil engineering which aims to develop students' skills in the elastic analysis of statically indeterminate structures.
Statically indeterminate structures: elastic analysis of forces and deflections (virtual work, strain energy, moment distribution); approximate analysis.

Matrix analysis of structures: introduction to force and displacement methods.
Elastic stability: fundamentals; stability of members (columns, lateral buckling of beams, beam-columns); framed structures.

**CE331 Water Engineering**
Three hours per week for one semester

A subject in the third year of the degree course in civil engineering which teaches students the theory relating to water engineering systems. On completion, students should be able to analyse or design the components of these systems.
Pump theory: use, selection and performance.
Channel flow: steady non-uniform phenomena.
Pipe systems: pressure conduits, equivalent pipes, reticulation networks, Hardy-cross analysis, water hammer.
Hydrology: rainfall and runoff, Rational formula, unitgraph method.
Irrigation: principles.

**CE341 Surveying**
Five hours per week for one semester

A subject in the third year of the degree course in civil engineering which extends basic survey theory and shows how surveying is used in engineering projects.
Control surveys: trigonometrical and horizontal control surveys; introduction to map projections and the Australian map grid; precise surveys.
Photogrammetry: introduction to the use of photogrammetry in engineering.
Engineering surveys: introduction to cadastral surveying; tacheometric surveys using conventional and EDM techniques for the production of detail plans; volume measurement and computation.
Practical work.

**CE351 Structural Design**
Six hours per week for one semester

A subject in the third year of the degree course in civil engineering which extends students' knowledge of the principles of structural design in concrete and gives students practice in the application of these principles.
Design theory (45 hours)
Design principles: planning and choice of structural type; stability, rigidity, economic considerations.
Concrete: material properties; mix design; design in reinforced concrete and prestressed concrete; structural brickwork.
Design practice (45 hours)
Design practice exercises in reinforced and prestressed concrete structural design. Computer programs are used to assist the design process where appropriate.

**CE361 Transport Engineering**
Four hours per week for one semester

A subject in the third year of the degree course in civil engineering which gives students a more in-depth understanding of the highway and traffic elements making up the road system. Upon completion of the subject students will be able to quantify many of these elements, e.g. highway and intersection capacities.
Highway and intersection capacity: uninterrupted flow, controlling and guiding traffic. Vehicular headway distributions, and will have a greater knowledge concerning the various means of regulating, controlling and guiding traffic.

Administration of Australian roads and highways
Highway and intersection capacity: uninterrupted flow, levels of service, applications, interrupted flow, i.e., intersections.
Traffic studies: parking studies, urban and rural parking, traffic accidents, causes and means of prevention, accident records, before-and-after studies, statistical tests and significance.
Traffic signals: types and control, Miller's formula, co-ordination and computerised control.
Traffic aids and roadside furniture: traffic signs, pavement markings, guide posts, guard fencing, etc.
Introduction to vehicular headway studies: statistics, random flow, vehicular headways, exponential spacing law, applications.
Road-making materials: roadstone and bitumen testing, current methods.
Flexible pavement design: review and application of engineering which develops further students’ understanding of the principles of mechanics and their applications to structural analysis.

CE411 Structural Mechanics
Four hours per week for one semester
A subject in the fourth year of the degree course in civil engineering which develops further students’ understanding of the principles of mechanics and their applications to structural analysis.

Plastic analysis: yield criteria (Tresca, von Mises); plastic theorems, collapse requirements; applications to framed structures, flat plates (yield line and strip methods).
Matrix analysis: direct stiffness method; plastic collapse of frames; introduction to analysis of continua (finite element).
Influence lines: influence lines for indeterminate beams and frames.
Elastic stress analysis: fundamental elastic equations (equilibrium, strain-displacement, compatibility, rheological) for two- and three-dimensional elements; applications in flexure and torsion for solid, hollow and open sections; plate bending equations.

CE421 Planning
Two hours per week for one semester
A subject in the fourth year of the degree course in civil engineering which aims to introduce students to the role of the engineer in urban and regional planning.

Town planning: purpose and function of planning; history of planning; neighbourhood planning; physical and socio-economic surveys in both urban and regional planning; structure of planning in Victoria.
Transport planning: introduction to transport planning; public transport systems; transportation systems management.

CE431 Water Engineering
Three hours per week for one semester
A subject in the fourth year of the degree course in civil engineering which introduces students to water engineering practice. On completion of the course, students should be able to apply water engineering principles to the design of distribution and disposal systems, and should have an understanding of water quality criteria and treatment methods.

Town water supplies: quantity and pressure requirements, supply mains, balancing storage, reticulation.
Storm-water drainage: urban drainage systems; retarding basins, culvert hydraulics.
Irrigation: methods, soil-water relationships, quantities.
Water quality: physical, chemical and bacteriological parameters.
Portable water treatment: methods, theory of sedimentation and filtration.
Waste-water treatment and disposal: methods and their application, loading rates.

CE451 Structural Design
Six hours per week for one semester
A subject in the fourth year of the degree course in civil engineering which extends students’ knowledge of the principles of structural design in steel and timber and gives students practice in the application of these principles.

Design theory (45 hours)
Steel: properties, failure modes; elastic and plastic design of elements and assemblies; connections, fabrication, economics of fabrication methods; non-destructive testing.
Timber: properties, design methods; connection.

Design practice (45 hours)
Exercises in steel and timber structural design, which will include the use of computer programs where appropriate.

CE481 Geomechanics
Three hours per week for one semester
A subject in the fourth year of the degree course in civil engineering which enables students to investigate and design simple foundations considering both soil shear strength and settlement characteristics and which gives students an awareness of the various soil factors which control the stability of a given soil slope.

Settlement: soil stresses, consolidation, settlement. Foundations: bearing capacity, shallow foundations (single, group, combined, rafts), deep foundations, settlement considerations.

Site investigation: planning, sampling methods, in situ tests. Slopes: cohesionless soils, cohesive soils, total and effective stress analysis, stability chart, residual strength.

CE501 Investigation Project
Six hours per week for one semester
A subject in the fifth year of the degree course in civil engineering which develops students’ initiative and self-education skills through work on an investigation project chosen from some area of civil engineering.

Project: students will work individually or in small groups on selected problems under staff supervision. Each project will require a literature survey and a theoretical and/or experimental investigation. Results and conclusions will be presented in a written report, and an oral report may also be required.
CE511 Structural Mechanics
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which extends the analytic abilities of students with a particular interest in structural mechanics.

Selected topics in structural mechanics such as:
- Finite difference methods: solutions for beams on elastic foundations, column buckling and plate-bending problems.
- Structural dynamics: free and forced vibrations for simple and multi-degree of freedom structures.

Emphasis will be given to the formulation of these problems for computer solution.

CE552 Structural Design
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which develops further the design skills of students who have a particular interest in structural design.

A selection of more advanced structural design projects, chosen to emphasise interpretation of current design codes and current design practices.

CE531 Water Engineering
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which extends students' knowledge into the field of non-steady, non-uniform flow. On completion, students should be able to apply the principles to practical problems.

A selection of topics from the following:
- Flood estimation, flood routing techniques, flood retarding basin design, reservoir yield analysis methods, ground-water flow, pressure surges in pipe systems, river engineering, ocean engineering.

Emphasis will be placed on the use of computers in analysis of problems.

CE551 Geomechanics
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which introduces students' knowledge of geology and soil mechanics; introduces them to rock mechanics, and gives students some appreciation of the high level of experience and 'art' required to practise in the area of geomechanics.

Earth pressure problems, braced excavations, tie-back walls and soil anchors, introduction to soil dynamics; introduction to rock mechanics; selected topics in soil engineering; further aspects of engineering geology.

CE551 Civil Design
Six hours per week for one semester

A subject in the fifth year of the degree course in civil engineering which develops students' ability to apply theoretical knowledge to practical design situations.

A range of designs chosen from structural and non-structural areas, including elective choices in areas of interest. Assignments which require creative solutions will be included. Answers to be in the form of written reports, design computations, drawings and models, as appropriate.

CE532 Environmental Engineering
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which introduces students to engineering practice in a range of construction projects and gives students a concept of cost of projects.

Introduction: plant, materials, labour.
Safety: equipment loss, temporary works, safety of labour.
Civil engineering works: fundamental principles, construction methods, cost.
Building works: fundamental principles, construction methods, cost.
Industrial complex construction: multidiscipline construction.
Marine structures and off-shore works: fundamental principles, construction methods, cost.

CE571 Construction
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which gives students specialist knowledge of the operating characteristics of traffic streams, provides a more in-depth treatment of urban road and freeway design, and examines in more detail the broad field of transportation engineering.

Road and freeway design: principles of urban road and freeway design, design of surface street systems for freeway traffic.
Transportation engineering: transportation networks, introduction to transport technology, introduction to transport economics, transport legislation.
Vehicular gap and delay theory: statistics, gap and delay theory, absorption of vehicles into passing traffic streams.
Theory of traffic flow: traffic flow models, hydrodynamic and car-following models, applications.
Queuing theory: application to simple case of random arrivals and exponential service distributions.
CE591  Professional Practices
Four hours per week for one semester

A subject in the fifth year of the degree course in civil engineering which introduces students to engineering management practice; makes students aware of the place of the engineer in society and introduces engineering economics to students.

The engineer and society: professional ethics, the role of the engineer in society; the effect of man on the environment.

Contracts: initiation of projects, feasibility studies, general conditions, forms of contract, legal elements of a contract, Contract documentation, contract law, termination of contracts, contract administration, including preselection of contractors, site supervision procedures, subcontractors, partial and final certificates, disputes, arbitration.

Economics: cost-benefits analysis, cash-flow forecasting, discounted cash-flow method, present worth criteria, welfare economics, social and private opportunity costs, case studies.

Civil engineering management: C.P.M. estimating, cash-flow forecasting, strategic planning.

Organising: personnel, plant, materials, labour, sub-contracts.

Leading: motivation, leadership, delegation of authority, time management.

Controlling: cost reporting, management failures.

Report writing: engineering technical reports, oral presentation of an engineering report, conduct of technical sessions. (This section will be integrated with other subjects in final year, for which technical reports are required.)

CE592  Municipal Engineering
Three hours per week for one semester

An elective subject in the fifth year of the degree course in civil engineering which develops in students an understanding of the structure, function and operation of local government, and the ability to apply basic engineering principles to the types of work typically carried out by municipal engineers.

Municipal (22½ hours)

Local government: structure, functions and operation, finance, liaison with other authorities, introduction to powers, duties, and legal liabilities of municipal engineers.

Municipal engineering: design, drainage, and lighting of residential streets, municipal traffic management schemes — including case studies, municipal parking.

Planning (22½ hours)

Statutory planning in municipal engineering, preparation: approval and enforcement of planning schemes, permits and appeals; interim development orders; study of the hierarchy of roads in existing and new urban developments; community facilities; use of remotely-sensed imagery in urban planning.

CE611  Structural Mechanics
Three hours per week for two semesters

A subject in the graduate diploma course in civil engineering.

A selection of topics in the fields of: statically indeterminate structural analysis, influence lines, model analysis, moment distribution for complex structures, secondary stress analysis; elastic stress analysis; elastic stability of beams, columns and frames; matrix methods of analysis; theory of plates and shells; basic plasticity.

References
To be advised by the lecturer.

CE621  Urban Systems 1
Three hours per week for two semesters

A subject in the graduate diploma course in urban systems.

Planning history, planning law, basic planning theory, neighbourhood planning; systems planning, planning data collection, regional planning, remote sensing.

References
Branch, M.C.  City Planning and Aerial Information. Cambridge, Mass., Harvard University Press, 1971
Chapin, F.S.  Urban Land Use Planning. 2nd edn, Urbana, University of Illinois Press, 1965

CE623  Town Planning
Three hours per week for two semesters

A subject in the graduate diploma course in civil engineering.

Planning practice, purpose of planning; basic surveys of planning; planning law; engineering for residential street design; traffic engineering surveys; statutory planning authorities involved in planning; transportation planning and use of model analysis; planning of airports, docks and harbours.

Reference

CE661  Environmental Planning
Three hours per week for one semester

A subject in the graduate diploma course in transportation systems.

Introduction to land-use planning; planner and transport planning; use of remote sensing techniques in transport planning; transport planning safety; sociological study of the transport problems within Australian cities; historical development of urban settlements; sociological effects of the built environment.

CE662  Transport Systems
Three hours per week for one semester

A subject in the graduate diploma course in transportation systems which seeks to develop in students a greater understanding of the broad field of transportation systems. Topics contained in the course include:

Transportation planning: evolution of regional and area-wide transportation plans; characteristics of transportation supply and demand; measurement and
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analysis of demand; trip production and distribution models; principles of planning evaluation, selection, adoption, financing, and implementation of alternative urban transportation systems; urban development models; community goals and objectives; inventory of existing conditions; continuation planning.

CE63 Traffic Engineering Practices
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems with an essentially practical emphasis. Topics covered in any year will include: traffic studies, surveys and measurements; human factor studies; traffic management and regulation; traffic control devices; parking studies; accident studies; safety standards; administration of public traffic systems; public relations; systems approach to the safe and expeditious movement of road traffic; volume, speed, density and headway relationships for traffic streams; gap, delay and vehicle absorption theory.

CE670 Construction Technology
Four hours per week for two semesters
A subject in the graduate diploma course in civil engineering construction which considers technological resources available in the execution of a construction project.
Planning of construction programs, resource allocation, plant and equipment, soil investigation and data interpretation, construction materials, trade skills, regulations.

CE681 Geology
Three hours per week for two semesters
An elective subject in the graduate diploma course in civil engineering.
Reference
Blyth, F.G.H. and deFreitas, M.A. A Geology for Engineers. 6th edn, Lond., Arnold, 1974

CE690 Civil Engineering Project Control
Four hours per week for one semester
A subject in the graduate diploma course in civil engineering construction which introduces the techniques for establishing and maintaining technical control of a civil engineering project.
General conditions of contract; forms of contract; drawings, specifications and quantities; estimating, scheduling and programming; quality control; documentation of work progress and costs; progress payment procedures; industrial safety.

CE691 Civil Engineering Management
Four hours per week for one semester
A subject in the graduate diploma course in civil engineering construction designed to develop an awareness of efficient site management techniques.
Responsibilities of a project manager: responsibility of site engineer; construction site organisation; site office procedures; contractor/principal relations; arbitration; company structures; man management; negotiations; arbitration and conciliation.

CE692 Communications
Four hours per week for one semester
A subject in the graduate diploma course in civil engineering construction designed to provide students with a range of experiences in communication which will increase their personal capacity to understand and communicate well at different levels of communication.
Development of written and oral communication skills; creative writing skills; effective articulation of ideas; a short history of civil engineering, establishing the historical role of the engineer in the development of human communications and placing the profession in its social context.

CE693 Powers and Duties of Local Government Engineers
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
Section A: Victorian Local Government Act, Motor Car Act — road traffic regulations, Country Roads Act; powers of statutory authorities to open and occupy roads.
Section B: contracts, conduct of an engineering office, conduct of construction and maintenance works; engineering economics and management.
References
To be given by lecturer.

CE721 Urban Systems 2
Three hours per week for two semesters
A subject in the graduate diploma course in urban systems.
Government, planning and the law; statutory planning; planning appeals procedure. Systems planning: plan formulation and plan evaluation; urban gaming simulation; systems planning exercises.
References
Chapin, F.S. Urban Land Use Planning. 2nd edn, Urbana, University of Illinois Press, 1965
Town and Country Planning Act, Victoria, Laws, Statutes, 1961
Victorian Planning Appeal Decisions (serial), Melb., Law Book Co.
CE722 Environmental Systems Management
Two hours per week for one semester
A subject in the graduate diploma course in urban systems.
Ecology; management of ecological systems; environmental impact statement; conservation planning; solid waste management and recycling; water supply and waste disposal; public health engineering.

References
Masters, G.M. Introduction to Environmental Science and Technology. N.Y., Wiley, 1974

CE723 Urban Transport
Three hours per week for one semester
A subject in the graduate diploma course in urban systems.
Transport and land-use planning; new transport systems; traffic engineering and management, freeways, parking studies.

References
Analysis of Urban Development. Melb., Department of Civil Engineering, University of Melb., 1970
Tewkesbury Symposium. University of Melbourne, 1970

CE731 Hydraulics and Public Health Engineering
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
Hydraulics: advanced hydrology, flood routing, evapotranspiration and runoff, ground water hydraulics; advanced hydraulics, urban water supply, pipe systems and pumps, water hammer, open channel flow, sediment transportation, ocean engineering.
Public health engineering: water quality, tests for water quality, methods of treatment; disposal of waste water, standards, measurement of pollution load, biological decay processes; disposal of solid wastes, methods system approach, recycling; air pollution sources, tests, effects, standards; diffusion in rivers and estuaries; systems analysis of waste-water treatment and disposal; ecological and economic constraints; case studies and laboratory work.

An important aim of the course is to prepare students for the Municipal Engineer's examination for the State of Victoria (held in August each year) and the Engineer of Water Supply examinations (held in October).

CE751 Concrete Design and Construction
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
Reinforced and prestressed concrete materials, mix design, general design criteria including function and flexibility requirement of structures, loading, fire rating, spans — precast, prestressed, in situ; basic concepts, design for working strength, ultimate strength for reinforced concrete and prestressed concrete and limit states; construction details and practical work.

References

CE752 Design of Steel Structures
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
Steel properties; permissible stress design of structural elements including plate-girders, beam-columns, base-plates, connections; plastic design of continuous beams, beam-columns, frames; connection between rotation capacity requirements and spacing of lateral restraints; stability in low-rise buildings.
Torsion in I-beams; box-columns; reduction in load-carrying capacity of structures at collapse; plastic moment distribution; shakedown and incremental collapse; welding — metallurgy, costing and inspection.

CE761 Municipal and Highway Engineering
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
Vertical and horizontal alignment of roads; design of urban road schemes; highway drainage; road construction and maintenance; highway engineering materials; traffic engineering; traffic signs and signals.

An important aim of the course is to prepare students for the Municipal Engineer's examinations for the State of Victoria (held in August of each year).

CE762 Public Transport Systems
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems.
Urban passenger transport: technological and operating characteristics of the modes including vehicles, way, loading points, speed, headway, capacity, variation in demand, modal interchange, fares and ticket handling, staffing, finance management; priority for buses, trams, taxis and car pools; proposals for new types of transport; inter-city passenger transport — comparison between modes.
CE763  Freight Transport Operations
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems.
Physical distribution of commodities, urban goods movement, fixed route transport, bulk granular freight handling, perishable goods handling; technological and operating characteristics of the modes, storage, transit time, rates; ownership of the carrier, organisation, management.

CE764  Urban Design
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems.
Students will be concerned with the physical form of the city, its analysis, design, social and economic effects on decisions of design. In particular we will look at local centres, design for recreation areas, transport systems, city streets and arcades, interaction between pedestrians and transport.

CE770  Construction Engineering
Four hours per week for two semesters
A subject in the graduate diploma course in civil engineering construction reviewing construction techniques for civil engineering projects.
Construction techniques for highways, bridges, railways, airports, tunnels, pipelines, foundations, buildings, dams, water supply structures, sewerage.

CE771  Construction Project Control
Four hours per week for one semester
A subject in the graduate diploma course in civil engineering construction which introduces students to a critical study of all aspects of a construction project.
Case studies of construction projects by report, discussion, seminars and lectures.

CE790  Financial Project Control
Four hours per week for one semester
A subject in the graduate diploma course in civil engineering construction which introduces financial concepts that are important in evaluating projects, in financing projects, in financial control and in determining the profitability of projects.
Cost control; financial control; determination of profitability; evaluation of projects; evaluation of sources of finance; evaluation of tenders; productivity monitoring.

CE821  Urban Systems 3
Three hours per week for two semesters
A subject in the graduate diploma course in urban systems.
Lectures, tutorials and seminars are held on advanced topics related to the multi-disciplinary projects to be carried out during the year. A range of final-year projects leading to the submission of a final thesis or dissertation are offered from the areas of urban transport, the urban environment, urban design, urban economics and urban sociology. The projects are designed to enhance the welfare of the local community.

CE822  Urban Design
Three hours per week for two semesters
A subject in the graduate diploma course in urban systems.
Students observe the physical form of the city, its analysis, design, social and economic effects on decisions of design. In particular they look at local centres — functions, issues and design problems, analysis of local centres, design for recreation areas — transport systems, city streets and arcades, interaction between pedestrians and transport, institutions and their districts.

Electives in Urban Systems
Three hours per week for two semesters
The following subjects are electives in the graduate diploma course in urban systems:

CE823  Urban Transport Systems
CE824  Systems Planning
CE825  Environmental Engineering
CE826  Urban Energy Systems
AT721  Urban Sociology
BS861  Urban Economics

Subjects will only run if there is sufficient student demand. Fifty per cent of the allocated time is spent on projects and the other 50 per cent in attendance at lectures to be given by specialists in various fields.

Syllabus details will be presented in the first lecture.

References
To be given by lecturer.

CE851  Design Projects
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
This subject is intended for students undertaking the full graduate diploma course in civil engineering.

There are suitable projects based on contents of structures, hydraulics, municipal surveying and highway courses.

Reference
Fuchs, H.O. and Steidel, R.F. eds. 10 Cases in Engineering Design. Lond., Longman, 1973

CE861  Transport Legislation
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems.
Statutory planning, planning appeals, preparation and amending planning schemes, federal transport bodies; planning Acts, ROSTA Act, Local Government Act, CRB Act and other relevant bodies.

CE863  Project: Case Study of Transportation Problem
Six hours per week for one semester
A subject in the graduate diploma course in transportation systems.
CE881 Soil Mechanics
Three hours per week for two semesters
A subject in the graduate diploma course in civil engineering.
Design of foundations: shallow and deep; earth pressure problems: braced excavations, tieback walls and soil anchors; introduction to soil vibrational theory; site investigations: planning, sampling, in situ testing; introduction to rock mechanics; selected topics in soil engineering; laboratory work and tutorials.

References

EA201 Chemical Engineering 1A
Three hours per week for two semesters
Assessment by three-hour examination at the end of each semester
A subject in the graduate diploma course in chemical engineering.

Recommended reading
Russell, T.W.F. and Denn, M.M. Introduction to Chemical Engineering Analysis. N.Y., Wiley, 1972

Textbook

EA202 Chemical Engineering Thermodynamics and Kinetics
Three hours per week for two semesters
Assessment by three-hour examination at the end of each semester
A subject in the graduate diploma course in chemical engineering.
First law of thermodynamics, ideal gas law, equations of state, principle of corresponding states, compressibility, fugacity, enthalpy deviation and entropy deviation charts, physical equilibrium: bubble point and dew point relations, colligative properties, single component properties and phase diagrams, refrigeration, engines, thermodynamic process analysis, activity, activity coefficients, thermodynamic consistency tests and integrated forms of the Gibbs-Duhem equation, computer procedures to Gibbs-Duhem equation, treatment of experimental data. Chemical reaction equilibria, concentration, temperature and pressure dependence of the rate of reaction, experimental methods of determination of reaction rate constants, batch, plug flow and backmix reactor analysis, reactor networks, non-ideal flow in reactors, fluid-particle reactions, fluid-fluid reactions, asymptotic solutions, adsorption and catalysis.

Laboratory experiments cover representative examples in both thermodynamics and reactor design areas.

Recommended reading

Textbooks

EA211 Chemical Engineering 1B
Three hours per week for two semesters, which includes one hour per week of problem-solving throughout the course, and one hour per week of practical work in the second semester
Assessment by examination
A subject in the graduate diploma course in chemical engineering dealing in depth with momentum and heat transfer, and the elements of boundary layer theory. Fans, pumps, valves, pipes and heat exchangers are discussed.

By consideration of the analogies between heat and momentum transfer, mass transfer is introduced prior to the students undertaking EA312/3/4.

Recommended reading
Molyneux, F. Laboratory Exercises in Chemical Engineering. Lond., Leonard Hill, 1967

Textbook

EA311 Chemical Engineering 2A
Three hours per week for two semesters
A subject in the graduate diploma course in chemical engineering.
Particle dynamics; motion of particles in fluids; filtration; fluidisation; flotation; pneumatic and hydraulic conveying; crushing; grinding; screening; mixing; electrostatic separation; gas and hydraulic cyclones.
Recommended reading
Molyneux, F. Laboratory Exercises in Chemical Engineering. Lond., Leonard Hill, 1967

EA312 Chemical Engineering 2B
Three hours per week for two semesters
A subject in the graduate diploma course in chemical engineering.
Theory of diffusion; Fick diffusion equation; diffusion coefficient; gas/solid/liquid interphase diffusion. Film and overall coefficients; gas absorption—packed towers, HTU and NTU; wetted wall and disc columns; flooding and tower diameter; penetration theory; absorption with chemical reaction; humidification and water cooling; cooling tower; drying; liquid-liquid extraction; solid-liquid extraction; crystallisation.
Recommended reading
Molyneux, F. Laboratory Exercises in Chemical Engineering. Lond., Leonard Hill, 1967

EA313/314 Chemical Engineering 2C
Three hours per week for two semesters
A subject in the graduate diploma course in chemical engineering.
Separation processes; co-current, counter current and cascade distillation; McCabe-Thiele, Lewis Sorel, Ponchon-Savarit methods, batch and continuous operation; two component and multi-component distillation, solvent extraction; absorption, ion exchange and absorption. Duhring & Cox charts; boiling point elevation; boiling heat transfer; Coulson & McNally correlation for tubular evaporators; evaporation single and multi-effect; thermal and mechanical recompression; economics.
Recommended reading
Molyneux, F. Laboratory Exercises in Chemical Engineering. Lond., Leonard Hill, 1967

EA319/320 Chemical Engineering
Nine hours per week for two semesters
A final year subject in the diploma course in chemical engineering.
For details refer EA311, EA312, EA313/EA314.

EA332/333 Instrumentation and Control Engineering
Three hours per week, which includes one hour per week of problem-solving throughout the course, and one hour per week of practical work in the second semester
Assessment by examination
A final year subject in the diploma course in chemical engineering which is concerned with the measurement and control of process variables such as temperature, pressure, etc. Computer control, and techniques for prediction of system stability are considered.
Recommended reading
Eckman, D.P. Industrial Instrumentation. N.Y., Wiley, 1950
Textbook

EA352 Project Thesis and Technical Report Writing
Four hours per week for one semester
A subject for part-time students in the diploma course in chemical engineering which involves the development and study of a research topic. Each topic is under the supervision of a specialist staff member and students are expected to make a significant contribution to the continuing project. To enable this to be dealt with, training is given in the efficient use of library facilities for the investigation of technical topics. Included in this is a detailed study of the techniques of report writing including the search for and collation of information, its organisation and presentation in oral and written form.
Students are expected to contribute to the construction and modification of their experimental equipment.

EA353/354 Process Plant Design and Economic Evaluation
Four hours per week for two semesters
A final-year subject in the diploma course in chemical engineering in which the development and costing of a complete chemical plant is considered. Subjects covered include: defining the problem, finding and evaluating alternative solutions; design uses of heat and material balances, flow-sheets; layout and layout models, control schemes, safety considerations.
Recommended reading
Krick, E. An Introduction to Engineering. N.Y., J. Wiley, 1976
Six hours per week for two semesters
A final-year subject in the diploma course in chemical engineering. For details refer EA352.

EA411  Non-Newtonian Heat, Mass and Momentum Transfer
Three hours per week for two semesters (including practical work)
Assessment by examination
A subject in the graduate diploma course in biochemical engineering which is intended to give students a thorough grounding in the engineering design aspects of the flow of non-Newtonian fluids.
A review of Newtonian fluid flow, heat transfer and mixing (up to and including solutions to relevant equations of motion), precedes the work on non-Newtonian flow, viscometry, heat transfer and mixing. The final aspect of the subject is the application of this work to some practical situations such as heat sterilisation.
Recommended reading

EA491  Biochemical Engineering
Three hours per week (including practical work) for two semesters.
Assessment by examination
A subject in the graduate diploma course in biochemical engineering.
Requirements for growth in biological material; variations in micro-organisms; fermentation pathways. Enzyme reaction kinetics and absolute reaction rate theory; continuous fermentation, aeration and agitation. Mass transfer theories. Bubble and mechanical aeration; scale up; operation and control. Biological waste treatment — BOD, COD. Mathematical modelling for the design of activated sludge plants, trickling filters and sludge digesters. Nitrification-eutrophication and river modelling.
Recommended reading

EE139  Engineering Principles: Electricity
Two hours per week for two semesters
A first-year subject in the associate diploma course in production engineering in which essentially descriptive, graphical and trigonometric methods are used to introduce topics such as energy conversion, circuit laws, electromagnetism, electrical measurements.

EE183  Electrical Circuits and Devices
Two hours per week for two semesters
A first-year subject in all engineering degree courses.
References
Smith, R.J.  Circuits, Devices and Systems. 3rd edn, N.Y., Wiley, 1976

EE186  Electrical Engineering Elective
Two hours per week for one semester
An elective subject in the first year of all engineering degree courses.
Digital electronics, transistors as switches and gates, bipolar and FET. Analog electronics amplifier types, effects of feedback on gain and band width. Rectification and filtering, single-phase bridge and multiphase rectification, capacitor filter, ripple. Communication systems, transducers, microphones, pickups and loudspeakers, principles of telephonic communication, simple modulation and demodulation of signals. Electrical energy systems, generation, transmission. Electrical energy in modern society. Student project.
Reference
Smith, R.J.  Circuits, Devices and Systems. 3rd edn, N.Y., Wiley, 1976

EE257  Electrical Design
Three hours per week for two semesters
A second-year subject in the degree course in electrical engineering.
Applications and performance.

Magnetic circuits: simple series and parallel circuits.

Electromagnets, Losses.
Transformers and inductors. Construction, classification, applications.
Introduction to computer-aided design. Interactive processing. Applications in selected fields of design.
Design assignments and laboratory projects.

References
Say, M.G. Alternating Current Machines. Lond., Pitman, 1976

EE281 Electrical Measurements
Two hours per week for one semester.

A second-year subject in the degree course in electrical engineering.

Measurement principles: accuracy and precision; errors, gross, systematic and random; calculation of means and standard deviations (normal distribution).
Measurement of circuit variables: moving iron, rectifier and p.m.m.c., dynamometer ammeter, dynamometer wattmeter, thermocouple, electronic voltmeter, digital voltmeter, oscilloscope and energy meters; polyphase power measurement; current and potential transformer, instrument loading.
Measurement of circuit parameters: models of circuit elements; resistance measurements, DC/AC bridges, impedance meter, time and frequency measurements; spectrum analysis.
Electrical standards: international and laboratory standards; standards of potential, capacitance and resistance; DC and AC potentiometers.

References
Gregory, B.A. An Introduction to Electrical Instrumentation. Lond., Macmillan, 1973
Harris, F.M. Electrical Measurements. N.Y., Wiley, 1966

EE282 Communication Principles
Three hours per week for one semester.

A second-year subject in the degree course in electrical engineering.

Communication systems: guided and unguided transmission systems, measures of channel performance, modulation techniques and spectrum management.
Analogue modulation techniques: AM, SSB, FM, PM, stereo broadcasts. Noise and fidelity.
Digital modulation techniques: PAM, PWM, PCM, Delta M. Multiplexing. Noise and error rates. FSK and PSK.
Information theory: selection of efficient codes for data transmission.

References

EE283 Electrical Circuits and Fields
Four hours per week for two semesters.

A second-year subject in the degree course in electrical engineering.

Circuit elements, linear and non-linear.
Steady state circuit analysis: mesh and nodal analysis.
Circuit theorems.

Three phase circuit: analysis. Power calculations.
Electrostatic field: Gauss’ Law, electric flux, displacement;

Gauss’ theorem; Poisson’s and Laplace’s Equations (Cartesian and cylindrical co-ordinates); method of images;
field plotting; calculation of capacitance for simple geometries; dielectrics, dipoles, polarization, displacement current; forces in electrostatic systems.
Natural response of circuits: first and second order circuits;
classical and Laplace methods.

Two port networks: parameters and interconnections.
Non-sinusoidal waveforms: Fourier analysis.
Electromagnetic fields: conduction; resistivity, current density and electric field in conductors; magnetic induction, magnetic flux and flux linkage; Ampere’s law, Stokes theorem, magnetic field intensity; mutual and self inductance, calculation of inductance; energy and forces in magnetostatic systems.

Analogous systems: analogies between electrical, mechanical, incompressible fluid and thermal systems.

References

EE284 Electronic Circuits and Devices
Two hours per week for two semesters.

A second year subject in the degree course in manufacturing engineering.


Modern devices: operational amplifiers, operation and applications.

Analogue and digital integrated circuits: A/D, D/A, converters, logic gates, binary arithmetic, combinational and sequential logic.

Counters, shift registers, clocks, flip flops, arithmetic units.

Applications.
Introduction to microprocessors: programming.

Overview of Transducers: Interpretation of output data.
Classroom demonstrations and practical work.

References

EE285 Electromagnetic Devices
Three hours per week for two semesters.

A second-year subject in the degree course in electrical engineering.

Introduction to energy conversion.

Single phase transformers; magnetic circuit characteristics; series and parallel magnetic circuits, coupled circuits, ideal and practical transformers; determination of transformer parameters; performance calculations for both power and audio frequency applications, equivalent circuits, DC motors and generators; principles of operation; e.m.f. and torque equations; excitation and armature reaction.

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Basic electro-mechanical energy conversion principles, torque and energy conversion; rotating magnetic field, 3-phase induction motors; characteristics and starting methods. Single-phase induction motors; principle and starting 3-phase cylindrical rotor synchronous machines, e.m.f. equation, armature reaction, synchronous impedance, phasor diagrams, motor operation. Starting and speed control of DC machines, parallel operation. Rating, losses and efficiency of various types of machines.

References

EE287 Electronics
Four hours per week for two semesters.
A second-year subject in the degree course in electrical engineering.

Combinational and sequential digital logic; semiconductor theory, P-N junction theory, P-N junction diode and its applications, bipolar junction transistor theory. BJT non-linear applications; amplifiers, BJT linear applications, field effect transistors, integrated circuits, negative feedback, oscillation.

References

EE290 Environmental Engineering
One hour per week for one semester.

A second-year subject in the degree course in electrical engineering.

Biological cycles of plants and animals. Pollution; measurements and measuring equipment, air pollution and gas cleaning methods; treatment of liquid effluents; electroplating wastes; nuclear plant wastes; fuel cells and batteries; recycling of materials

EE323 Electronics
Three hours per week for one semester
A third-year subject in the degree course in manufacturing engineering.

Analysis of signals, signal processing networks, diodes, rectifiers, power supplies, basic amplifiers, frequency response, transistors, transistor biasing, transistor amplifier using hybrid-H equivalent, SCR, FET, UJT, PUT, LDR, photocells, characteristics and applications. Measurement and recording, modulation, operational amplifiers, characteristics and performance and use in computation, block approach to amplifiers and feedback. Digital electronics, oscillators, multivibrators, control systems, transducers.

References

EE357 Electrical Design
Three hours per week for one semester
A third-year subject in the degree course in electrical engineering (1980 syllabus).


References
Grant, E.L. and Leavenworth, R.S. Statistical Quality Control. 4th edn, N.Y., McGraw-Hill, 1972
Selected Australian, British, DEF (Aust) and MIL Standards.

EE364 Electric Power
Five hours per week for one semester
A third-year subject in the degree course in electrical engineering (1976 syllabus).


References

EE366 Electronics
Six hours per week for one semester
A third-year subject in the degree course in electrical engineering (1976 syllabus).


References
EE368 Linear Control Systems
Four hours per week for one semester
A third-year subject in the degree course in electrical engineering (1976 syllabus).
Analogous systems; solution of linear differential equations; transfer functions, block diagrams, signal flow graphs; S-plane analysis, steady-state errors; open loop and closed loop systems, servomechanisms, position servo, speed-control systems; frequency response, Nyquist plots, gain and phase margins, state-variable methods; system stability; analogue computations.

References

EE381 Environmental Engineering
One hour per week for one semester
A third-year subject in the degree course in electrical engineering (1976 syllabus).
Biological cycles of plants and animals. Pollution.

EE383 Electromagnetic Fields
Two hours per week for one semester
A third-year subject in the degree course in electrical engineering (1980 syllabus).
Static and quasistatic electric and magnetic fields: fields in materials; boundary conditions in dielectric, magnetic and conductive materials; solution of boundary value problems by image methods; conformal transformation; finite difference; multiple conductor systems, partial and total capacitance, self and mutual inductance, per phase inductance in polyphase systems.

Electromagnetic wave propagation: Maxwell’s equations, Helmholtz equations and solutions for perfect electric and ideal conductor; TEM plane waves, wave impedance, phase and group velocity, Poynting’s theorem and Poynting’s vector; plane wave penetration in good conductors; reflection and refraction of plane waves at boundaries between dielectrics and conductors; lossless transmission lines, characteristic impedance, phase and group velocity, reflections at mismatched terminations and discontinuities in lines, impedance matching; TEM waves between parallel perfect conducting planes, introduction to wave guides.

References

EE385 Electrical Power and Machines
Five hours per week for one semester
A third-year subject in the degree course in electrical engineering (1980 syllabus).
Introduction to power systems.
Transmission line parameters; line hardware and insulations; cables; symmetrical and asymmetrical lines; parallel lines; line representation; circle diagram; power system representation; single line diagrams; per unit methods; voltage regulation.

Three-phase transformers; transformer connections; harmonic phenomena; synchronous machines: steady state analysis; cylindrical rotor and salient pole characteristics; two-axis theory, equivalent circuits; capability diagram; interconnected machines, induction machines; equivalent circuit; performance characteristics; effect of rotor resistance; starting and speed control.

References
Say, M.G. Alternating Current Machines. 4th edn. Lond., Pitman, 1976

EE387 Electronics and Communications
Five hours per week for one semester
A third-year subject in the degree course in electrical engineering (1980 syllabus).
Analogue electronics including operational amplifiers, D/A, A/D conversion, data acquisition.

Digital electronics including LSI devices, microcomputers and digital signal processing.

Communications electronics including LSI devices, microcomputers and digital signal processing.

Communications electronics with an emphasis on the electronics of quantisation of signals, compression and expansion of signals, PCM and DM systems, mixers and modulators.

References
Smiel, G. Telecommunication Systems. Units 5 and 6, Milton, Keynes, The Open University, 1976

EE389 Linear Control Systems
Four hours per week for one semester
A third-year subject in the degree course in electrical engineering (1980 syllabus).

The 2nd order system. Time domain and frequency response methods. Stability of linear systems. State variables and the state model.

Introduction to feedback control systems. Analysis of simple systems using time domain and frequency response methods. An example of an electro-mechanical control system.
EE405  Semi-conductor Electronics
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.
Semi-conductor physics, bipolar and field-effect transistors,
technology and fabrication of silicon-integrated devices.
Analogue integrated circuits: operational amplifiers, voltage
regulators, switching regulators, comparators, analogue
switches, phase-locked loops, linear IC applications.
Oscillators and timing: sinusoidal oscillators, crystal
oscillators.
Optoelectronics: liquid crystal and light-emitting diode
displays, opto-couplers and isolators, fibre-optic links.

References
Millman, J. and Halkias, C.C. Integrated Electronics. N.Y.,
McGraw-Hill, 1972
Hewlett-Packard Optoelectronics Division Staff,
Optoelectronics Applications Manual. N.Y., McGraw-Hill,
1977
Weber, S., ed. Circuits for Electronics Engineers. N.Y.,
McGraw-Hill, 1977

EE406  Digital Logic
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.
Logic gate functions: introduction in the basic logic gate
function, and the synthesis of simple logic circuits. Boolean
algebra; use of Boolean algebra in logic function description
and analysis; inverting and non-inverting logic; relationship
with truth tables.
Binary arithmetic: binary numbers, addition, subtraction;
positive and negative numbers; binary and binary-coded
decimal; other binary codes.
Combination logic: analysis and synthesis of
combinational logic functions; Karnaugh maps and
minimisation; comparators, decoders, encoders,
multiplexers, half and full adders.
Sequential logic: RS flip-flops; gated and clocked RS, D, and
JK flip-flops; applications to shift registers, counters; theory
of unclocked and clocked sequential circuits.
Introduction to microcompressor microprocessors.

References
Hill, F.J. and Peterson, G.R. Introduction to Switching
Theory and Logical Design. 2nd edn, N.Y., Wiley, 1974
McCluskey, E.J. Introduction to the Theory of Switching
Circuits. N.Y., McGraw-Hill, 1965
Rowe, J. An Introduction to Digital Electronics, 3rd edn, Syd.,
Electronics Australia, 1978

EE407  Switching Circuit Analysis and
Synthesis
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.
Transistors and diodes as switches: circuit models for
diodes, bipolar transistors, and FETs in switching
circuits; static analysis of switching circuits; clipping and
clamping.
Bistable, monostable and astable circuits; analysis and
design of bistable, monostable and astable circuits; simple
triggering methods; saturating and non-saturating
circuits; Hysteresis and Schmitt trigger.
Switching speed: the factors limiting switching speed;
methods of improving speed; saturating and
non-saturating circuits.
Basic logic gate characteristics: simple diode
and transistor logic gate circuits; loading, fan out, logic levels
and level shifting, noise margin, propagation delay;
threshold logic circuits.

References
Strauss, L. Wave Generation and Shaping. 2nd edn, N.Y.,
McGraw-Hill, 1970

EE408  Input/Output Techniques
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.
Digital to analogue and analogue to digital conversion:
digital to analogue converters; switched resistor networks,
tolerances, accuracy, linearity, speed; multiplying D/A
converters; analogue to digital conversion techniques;
successive approximation, parallel, and counter ramp
converters; analogue multiplexing and demultiplexing.
Input transducers: electrical characteristics of common
analogue transducers; capacitive, electromagnetic, optical,
piezoelectric thermocouple and resistive transducers;
transducers with digital output; electromechanical
switches, keyboards.
Power output devices: power switching devices and
circuits; AC and DC switching; isolation between small
and signal and power circuits; inductive loads.
Visual readout: optical readout devices; seven-segment
and dot matrix alphanumeric displays; CRT displays.
Data storage systems: introduction to active device
memory; magnetic core and magnetic surface memory;
magnetic bubble memory.

References
Bammister, B.R. and Whitehead, D.G. Fundamentals of
Cermi, R.H. and Foster, L.E.E. Instrumentation for
Hoeschele Jr., D.F. Analog-to-Digital/Digital-to-Analog
Norton, H.N. Handbook of Transducers for Electronic
EE417  Electrical Technology
Two hours per week for one semester
A subject in the graduate diploma course in energy systems.
Revision of AC circuits: single and three-phase power and energy concepts; analysis techniques in both the time and frequency domain.
Magnetic circuits: terms, definition and concepts; materials; energy conversion storage and losses.
Transformers: construction; circuit models; regulation, losses and efficiency.
Rotating machines: basic principles; EMF, torque and speed relationships; losses and efficiency; induction machines; synchronous machines; DC machines; selection for particular applications.
Rectifiers and inverters: general principles; types of converter; losses and efficiency; operating characteristics.

References
Fitzgerald, A.E. et al. Electrical Machinery, 3rd edn. N.Y.,
McGraw-Hill, 1971
Thaler, G.J. and Wilcox, M.L. Electrical Machines. N.Y.,
Wiley, 1976

EE457  Electronic Design
Three hours per week for one semester
A fourth-year subject in the electronics stream of the degree course in electrical engineering.
Design techniques and case studies.
Electromagnetic compatibility: interference sources and suppression, shielding, filtering and earthing practices, interference standards and measurements.
Illumination engineering: principles of lighting quantities, luminaire and illumination calculations, commercial and public lighting designs.
Project work involving design, testing and presentation of results in class seminars and written reports. Technical report writing.

References
Say, M.G. The Performance and Design of AC Machines. 3rd edn, Lond., Pitman, 1958

EE454  Electrical Design
A fourth-year subject in the degree course in electrical engineering which is undertaken during the industrial experience semester.
Human engineering: anthropometry, vision, hearing, machine compatibility and interaction.
Technical report writing: presentation of technical reports. During the industrial experience semesters, students may attend group seminars, but will be provided with printed notes and other reference material to enable them to complete the subject externally, by assignments.

References
Grant, E.L. and Leavenworth, R.S. Statistical Quality Control. 4th edn, N.Y., McGraw-Hill, 1972
Selected Australian, British, DEF (Aust) and MIL Standards

EE463  Circuits and Fields
Two hours per week for one semester
A fourth-year subject in both streams of the degree course in electrical engineering.
Transmission lines and waveguides: propagation in lossless lines, characteristic impedance, wave velocity, standing wave ratio, impedance, matching.

References

EE485  Electrical Power and Machines
Six hours per week for one semester
A fourth-year subject in the electrical power stream of the degree course in electrical engineering.

Faculty of Engineering
Network equations: matrix methods; load flow studies, symmetrical faults; symmetrical components and unsymmetrical faults.
Single phase motors and other small machines; characteristics and performance; A.C. commutator machines; advanced topics for D.C. machines. Solid state control: rectification and inversion; commutation; harmonics; triggering circuits.

Reference

EE486 Electronics and Communications
Four hours per week for one semester.
A fourth-year subject in the electrical power stream of the degree course in electrical engineering.

Analogue electronics: applications of operational amplifiers to signal processing, power amplifiers, power electronics devices and circuits.
Digital electronics: microprocessor and minicomputer stand-alone applications.
Communications: synthesis of one and two port networks; active filters; principles of PCM and multiplexing.

References

EE487 Electronics and Communications
Six hours per week for one semester
A fourth-year subject in the electronics stream of the degree course in electrical engineering.

Analogue electronics: wideband amplifiers, multiple stage and single stage multipliers; power amplifiers; tuned amplifiers; introduction to power electronics.
Digital electronics: introduction to sequential state machines; microprocessor; I/O hardware and software, memories, addressing; line drives and receivers.
Communications: network analysis, one and two port networks, filter approximations and realisations, active filters; spectral analysis, applications of Fourier series, Fourier transforms; principles of PCM and multiplexing.

References

EE488 Electrical Power and Machines
Four hours per week for one semester
A fourth-year subject in the electronics stream of the degree course in electrical engineering.

Network analysis: matrix methods; load flow studies, symmetrical faults.

Reference

EE489 Control Systems
Four hours per week for one semester
A fourth-year subject in both streams of the degree course in electrical engineering.

Classical design techniques for linear systems.

References

EE505 Integrated Circuit Components
Four hours per week for one semester
A subject in the graduate diploma course in digital electronics.

Algorithmic state machines: definition of classes, symbols, conversion of functional specifications into ASM charts. Realisation of ASMs with small scale, medium scale and large scale integrated circuit devices. Application of ASM techniques. Microprogrammed computer architecture, bit slice microprocessor components and techniques. Linked ASMs and their relationship to interfacing methods for hardware and software modules.

References
EE506  Digital System Techniques
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.

An exploration of the techniques applicable to digital systems including addressing, bussing, multiplexing, serial and parallel data transmission. The design of sequential-state machines and digital computer systems. The use and impact of microprocessor-based systems, using the above techniques, will be considered.

References

EE507  Digital System Applications
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.

A study of digital systems design problems using the techniques developed in the previous three semesters. The choice of parallel or serial signals, use of standard components, hardwired logic, ROMs, and microprocessors. Interfacing and timing. Synchronous and asynchronous systems.

Applications are selected from the fields of: timing and counting, displays, control, communication, logic sequencing and signal transmission and reception.

Opportunity is provided for students to design systems relevant to their own area of specialist interest.

EE508  Design and Project
Four hours per week for one semester

A subject in the graduate diploma course in digital electronics.

Individual design projects undertaken by participants under supervision. Each project entails setting of specifications, system design, choice of components, testing and reporting performance. Each participant in the program presents a seminar and a formal written report on the completed design.

Project topics are selected by participants in consultation with staff supervisors.

Design projects may be integrated with the participants normal work program, but must be approved by a supervisor before commencement.

EE515  Energy Utilisation and Conservation
Two hours per week for one semester

A subject in the graduate diploma course in energy systems.

Electrical distribution: overhead and underground systems; substations; reticulation in industrial plants and buildings; switchgear and protection; safety and earthing; AC-DC conversion; special power supplies; power factor correction; wave form correction; energy charges; design for minimum energy cost; load management for the consumer.

Electrical plant: motor drives; energy-efficient selection and use; motor control and protection; solid-state power supplies; noise in electrical machines; electric heating; electric arc processes; electrolytic processes; cathodic protection; electric lighting; illumination design.

Heating, ventilating and air-conditioning: fan types; power and efficiency; ventilation requirements; heaters and heat exchangers; energy requirements as a function of building architecture; thermal insulation; introduction to air-conditioning plant; types of systems in current use; chillers; humidifiers; cooling towers; control systems.

Total energy systems: combined process heating and power generation; waste heat recovery; integration of solar heating; centralised energy plant, reticulation systems for steam, hot and chilled water; selection and use of multi-purpose fuels; cycle efficiency; optimisation using system modelling techniques.

Conversion of various energy sources: industrial and commercial.

Human factors in plant design and operation: perceptual skills; anthropometric factors; control design; control/display matching; operators as parts of closed-loop systems; safety and industrial health aspects.

Non-electrical power transmission: pneumatic systems; hydraulic systems; mechanical transmission equipment; efficiency and noise.

References
Say, M.G. Alternating Current Machines. Lond., Pitman, 1976
Domestic energy applications: factors in the choice of energy sources; low-grade solar energy for heating and cooling; thermal accumulators for domestic applications; wind power; battery storage systems; thermal insulation; home architecture for energy conservation.

Energy system overall analysis
Energy modelling, the economic and physical contribution from various sources and their inter-dependency; sensitivity studies related to the allocation of scarce resources with physical constraints.

References

EE517 Energy Transmission and Transportation
Two hours per week for one semester

A subject in the graduate diploma course in energy systems.

Electrical transmission
Power system principles: generating stations; terminal stations; substations; urban and rural distribution; reliability of supply.

Transmission lines: effect of length; voltage selection; conductor types and sizes; surges and insulation co-ordination; HVDC lines; converter stations; operating considerations; daily load curves; generation mix.

Power system analysis: load management, efficiency of energy transmission; losses; stability and fault analysis; computer modelling; load transfer limits; reactive power control.

Protection and switch gear as factors affecting energy transmission: protection principles; relaying; real-time computer monitoring; survey of power switch gear.

Gas and fuel supply
Gas transmission: adiabatic and isothermal compressible flow of gases and vapours; load storage optimisation; facilities for pipeline operation; solid suspensions; blowing and slurries; gas reticulation.

Fuel transport: rail and road transport of solid and liquid fuel; mechanical conveying; sea transport of oil and liquefied natural gas; terminal installations.

References

EE555 Electrical Design and Project
Five hours per week for one semester

A final year subject in the electrical power stream of the degree course in electrical engineering.

Systems engineering principles.
Economic, environmental, and social aspects of design, cost-benefit analysis, design case studies.

Project work involving design, experimentation, investigation, testing, and presentation of thesis. Student seminars on project topics.

References
McCull, G.D. The Economics of Electricity Supply in Australia. MUP, Carlton, 1976

EE557 Electronic Design and Project
Five hours per week for one semester

A final year subject in the electronics stream of the degree course in electrical engineering.

Systems engineering principles.
Economic, environmental, and social aspects of design, cost-benefit analysis, design case studies.

Project work involving design, experimentation, investigation, testing, and presentation of thesis. Student seminars on project topics.

References
McCull, G.D. The Economics of Electricity Supply in Australia. MUP, Carlton, 1976

EE571 Operations Research in Electrical Engineering
Four hours per week for one semester

A final year subject in the electrical power stream of the degree course in electrical engineering. This subject is conducted jointly by the Department of Electrical and Electronic Engineering and the Department of Mathematics.

A selection of topics from: linear programming, Markov processes, queuing theory, dynamic programming, network analysis, simulation.

Case studies in the application of operations research techniques to electrical engineering.

References
EE573  Operations Research in Electronic Engineering
Four hours per week for one semester
A final year subject in the electronics stream of the degree course in electrical engineering. This subject is conducted jointly by the Department of Electrical and Electronic Engineering and the Department of Mathematics.
A selection of topics from: linear programming, Markov processes, queuing theory, dynamic programming, network analysis, simulation.
Case studies in the application of operations research techniques to electronic and communications engineering.
References

EE580  Computer System Engineering
Four hours per week for one semester
A fifth-year elective subject in both streams of the degree course in electrical engineering.
Number systems and machine representation of binary numbers and characters; storage of data sets and data flow, areas, lists, stacks, queues, dequesues, trees; system analysis; machine language and assembly language of a selected digital computer, symbolic assembly language, macros, literals, pseudo-instructions; searching and sorting techniques, high level languages and their compilation, introduction to operating systems, memory management, program segmentation and linking, input/output programming, file management, multiprocessing, distributed processing, foreground and background processing, parallel processing, computer networks; peripherals, interfacing, industry standards.

EE581  High Voltage Systems
Four hours per week for one semester
A fifth-year elective subject in the electrical power stream of the degree course in electrical engineering.

EE582  Communication Systems
Four hours per week for one semester
A fifth-year elective subject in the electronics stream of the degree course in electrical engineering.
Coding theory: linear and cyclic codes, error detection and correction, practical coding and decoding algorithms. High frequency lines: review of line equations, 3/4 wave transformers, single and double stub matching.
Data transmission: modems, channel characteristics, buffering and concentrations, random access techniques, satellite communications. Microwave communication: devices, waveguides, measurements. Antennas and propagation: Navigational aids ➞ radar.
References

EE583  Electrical Machine Drives
Four hours per week for one semester

EE584  Electronic Systems
Four hours per week for one semester
A fifth-year elective subject in the electronics stream of the degree course in electrical engineering.
Analogue methods: information processing, analogue/digital interface, analogue function modules, high speed electronics. Typical systems: opto-electronics, instrumentation electronics, transducers, telemetry, power electronics, telecommunications electronics.
References
Peatman, J.B. Microcomputer Based Design. N.Y., McGraw-Hill, 1977

EE585  Electrical Power Engineering
Eight hours per week for one semester
A fifth-year subject in the electrical power stream of the degree course in electrical engineering.


Overvoltages and transients of electrical supply systems. Overvoltage protection. Circuit interruption principles and circuit breakers.

Protection principles. Protection schemes for electrical plant and systems.


References

Bewley, L.V. Travelling Waves on Transmission Systems. 2nd edn, N.Y., Dover, 1951

EE586 Computer Electronics
Four hours per week for one semester.

A fifth-year elective subject in the electronics stream of the degree course in electrical engineering.

Review of current LSI technology, microprocessors, memories, peripherals, high density and high speed technologies; computer architecture, computer elements, micro-operating sequences, microprogrammable processors; buses and bus standards, interfacing to peripherals and processors; programming techniques for dedicated processors, real-time operating systems; hardware and software support for developing dedicated systems, use of interpreters; simulation, emulation; priority interrupts, DMA: system design, allocation of hardware and software functions, design of software and hardware for debugging, commissioning techniques.

EE587 Electronic Engineering
Eight hours per week for one semester.

A fifth-year subject in the electronics stream of the degree course in electrical engineering.

Analog electronics: negative and positive feedback in amplifiers and oscillators, phase-locked loops and frequency synthesis, D.C. amplifiers, power electronics.

Digital electronics: Introduction to other microprocessors, interfacing methods, hardware and software support for microprocessor system development.

Communications: microwave devices and propagation; high frequency lines.

EE588 Electronics
Four hours per week for one semester.

A fifth-year elective subject in the electronics power stream of the degree course in electrical engineering.

A selection of topics from: solid state switching, tuned amplifiers, positive/negative feedback amplifiers, power amplifiers, analogue data acquisition, digital signal processing.

EE589 Control Systems
Four hours per week for one semester.

A fifth-year elective subject in both streams of the degree course in electrical engineering.

Advanced treatment of linear systems analysis applied to multiple input/output systems and process control.

Design of systems with non-linearities. Use of intentional non-linearities in design. Stability of non-linear systems. Liapunov techniques. Use of bias signals and 'dither'.

Discrete time system. Sampled data Z transforms. Stability of discrete data systems. Application to computer and microprocessor based systems.

Optional control concepts: Optimal and adaptive control strategies.

Stochastic signals and statistical design methods.

Computers in control system design; digital and hybrid.

Industrial control: Industrial drives, process control systems, the use of digital control techniques.

Propel — design of an industrial system.

References


EG501 Statistics and Methodology of Research

A subject which is normally taken by students enrolled for the degree of Master courses in engineering or applied science.

Statistics: study of applications of statistics in experimental design and analysis.

Instrumentation: introduction to instrumentation, transducers, amplifiers, recorders, etc. appropriate to the students' research projects.

Literature review: critical review of selected literature in the student's field of review.

This subject may be undertaken over a period of two years.

Classes in statistics and instrumentation are arranged so that requirements can be met in any two-year period.

EM405 Engineering Physical Science

This is an omnibus subject in the mechanical engineering degree course. It contains seven disciplines based on the physical sciences, mathematics being included. Assessment is continuous throughout the course.

Electronics

A course of forty hours extending over the first two decaweeks. Basic principles of electronic elements and simple systems with emphasis on solid-state devices.

Applications to simple types of analogue and digital instruments and controllers.

References


Fluid mechanics

A course of eighty hours extending over four decaweeks. Properties and behaviour of fluids in relation to statics, kinematics and kinetics. Incompressible and compressible flows in closed and open systems. Dimensional analysis. Boundary layers. Applications to machinery and systems and to vehicles and buildings.

References


Douglas, J.K. Solutions of Problems in Fluid Mechanics,
Part II. Metric edn, Lond., Pitman, 1970

Machines
A course of ninety hours extending over five decaweeks.

References

Thermodynamics
A course of eighty hours operating in two groups of two decaweeks. Consideration of fundamental thermodynamics and heat transfer and the properties and behaviour of working substances including non-reactive mixtures. Applications to refrigeration, air-conditioning, industrial processes and power, including aspects of nuclear and thermo-electric engineering.

References
Angrist, S.W. Direct Energy Conversion. 3rd edn, Boston, Allyn and Bacon, 1976
Segre, E. Nuclei and Particles. N.Y., Benjamin, 1965

EM406 Industrial Technology
This is an omnibus subject in the mechanical engineering degree course. It aims at preparing the students for real life engineering tasks. The course extends over the first three decaweeks in each of the two final years of the degree course and amounts to 530 hours. The subject includes design and project work and students are placed in a situation where they are called on to integrate experiences from formal disciplines and other sources to meet the requirements of realistic engineering tasks.

EM407 Industrial Experience
This is an omnibus subject in the mechanical engineering degree course. Whereas the other subjects unique to the degree course are college-based, this subject is work-based. For standard full-time students the subject involves employment in industry in the last decaweek (ten weeks) in each of the last two years of the course.
EM417 Thermal Technology
Two hours per week for one semester

A subject in the graduate diploma course in energy systems.

The course provides a thermodynamic background for later studies and includes the following topics: working fluids and systems; availability of thermal energy; cycles; heat transfer; combustion.

References
Eastop, T.C. and McConkey, A. Applied Thermodynamics for Engineering Technologists — S.I. Units. 2nd edn, Lond., Longmans, 1970

EM421 Process Heating

This part-time subject is for the graduate diploma in heating, ventilation, air-conditioning and refrigeration. The course amounts to sixty hours of lectures, tutorials, seminars, visits and practical work. Assessment is continuous throughout the course.


EM424 Energy Resources and Conversion

Four hours per week for one semester

A subject in the graduate diploma course in energy systems.

The course reviews fossil fuel resources, solar radiation principles and energy usage patterns. Other topics include: synchronous machines; steam plant; heat exchangers; gas turbines; heat pumps; hydro power; energy storage systems and devices. Practical and demonstration work is integrated with lectures.

References
Howard-Smith, I. and Werner, G.J. 'Coal Conversion Technology'. Chemical Technology Review. No. 66, N.D.C., 1976

EM425 Environmental Engineering

Two hours per week for one semester

A subject in the graduate diploma course in energy systems.

The syllabus outline is as follows: Human comfort; atmospheric emissions; noise; environmental factors associated with power stations; transportation of liquid fuels.

References

EM441 Air-conditioning 1

This part-time subject is for the graduate diploma in heating, ventilation, air-conditioning and refrigeration. The course amounts to ninety hours of lectures, tutorials, seminars, visits and practical work. Assessment is continuous throughout the course.

The syllabus outline is as follows: psychometric properties of the air-water mixture. Psychrometric chart and processes. Condition criteria. Heat transfer; summary of conduction, convection and radiation. Heat gain and loss from buildings; determination of system parameters. Methods of heating, cooling, humidifying and dehumidifying. Air cleaning. Ventilation and heating. Instrumentation and control of systems.

References
Great Britain, Ministry of Power and Fuel Efficiency Committee. The Efficient Use of Steam. Lond., HMSO, 1947
Tables of Refrigerant Properties. Swinburne College Press

EM442 Air-conditioning 2

This part-time subject is for the graduate diploma in heating, ventilation, air-conditioning and refrigeration. It follows on subject EM441. The course amounts to ninety hours of lectures, tutorials, seminars, visits and practical work. Assessment is continuous throughout the course.

The syllabus outline is as follows: vibration and noise. Fluid flow, duct design, air distribution. Heat transfer; non-steady state and complex shapes. Systems; survey of general forms of air-conditioning systems; selection of systems. Refrigeration applied to air-conditioning. Applications — industrial, commercial. Planning and organisation.

References
Faculty of Engineering


EM443 Refrigeration I
This part-time subject is for the graduate diploma in heating, ventilation, air-conditioning and refrigeration.

The course amounts to ninety hours of lectures, tutorials, seminars, visits and practical work. Assessment is continuous throughout the course.

The syllabus is as follows: properties of refrigerants, analysis of vapour compression cycle and descriptive work on the principal components; descriptive work on absorption and steam jet systems; analysis of air cycles; food preservation; refrigeration load computations.

References
Stoecker, W.F. Refrigeration and Air Conditioning. Tokyo, McGraw-Hill, 1971

EM444 Refrigeration 2
This part-time subject is for the graduate diploma in heating, ventilation, air-conditioning and refrigeration.

The course amounts to ninety hours of lectures, tutorials, seminars, visits and practical work. Assessment is continuous throughout the course.

The syllabus comprises topics selected from: complex vapour compression cycles; absorption system analysis; heat, mass, and momentum transfer; cryogenic systems; thermo-electric systems; evaporative condenser and cooling tower analysis; operation of vapour compression systems including detection of common faults.

References
Stoecker, W.F. Refrigeration and Air Conditioning. Tokyo, McGraw-Hill, 1971

EM451 Project Work
This part-time subject is for the graduate-diploma in heating, ventilation, air-conditioning and refrigeration.

The course amounts to 120 hours of lectures, tutorials, project progress and seminars. Assessment is continuous throughout the course instead of by the traditional single final examination.

The work involves design, construction, evaluation and/or testing, in varying proportions, of either equipment or plant relating to the field of heating, ventilation, air-conditioning and refrigeration.

EM453 Mechanical Design
This subject is the final mechanical design subject for production engineering students. The course is usually held in the first semester of the fourth year and amounts to eighty hours, including lectures, tutorials and projects.

Assessment is continuous throughout the course instead of by the traditional single final examination. The syllabus is similar to that for subject EM351 but is reduced in breadth and depth of treatment.

References
Shigley, J.E. Mechanical Engineering Design. N.Y., McGraw-Hill, 1956

EM461 Creative Engineering
This post-diploma subject aims at developing the latent abilities of engineers in the solution of open-ended problems. The course amounts to ninety hours including lectures, seminars, discussions and group working. Assessment is continuous throughout the course.

The course is essentially an evaluative one, and leads the participants through the series of techniques and methods which have been developed to aid creative production of alternate solutions. The participant also examines needs analysis, problem analysis, and evaluation, as well as functional aesthetics. Students are encouraged to develop techniques which suit their own temperament and abilities. Brainstorming techniques form an important part of the course.

EM462 Human Engineering
This post-diploma subject may be undertaken by graduates from most courses. The course amounts to 120 hours, including lectures, demonstrations, tutorials, seminars and practical work. Assessment is continuous throughout the course.

The syllabus topics are similar to those for subject EM362/363 but-the theory is dealt with in a more rigorous manner and the seminar topics are closely allied to the industrial experience of the participants.

References


**EM465 Engineering Art and Behavioural Science**

This is an omnibus subject in the mechanical engineering degree course. It contains seven formal disciplines having significant areas based on the arts or the behavioural sciences. Assessment is continuous throughout the course.

**Administration**

A course of forty hours extending over the last three decaweeks. Studies in some of the economic, financial and organisational factors of administration with particular reference to the ways in which they affect engineers and others in industry and society. Applications particularly to practices in Australia and nearby countries.

**References**


**Fine arts**

A course of twenty hours held in the fourth decaweek. This is a beginners’ course in sketching, painting or sculpture, in which students are encouraged to find and develop their creative abilities.

**History and philosophy of industry**

This course of forty hours seeks to encourage the student to be an ongoing self-teacher. To this end the content is selected freely from many sources with a strong psychological and self-development bias. Topics covered include technological and social change and individual adjustment to this change, divergent and convergent thinking, defence mechanisms and early learning experience, conflict and anxiety, marriage, family and inter-personal relations with applications of the family paradigm to relations in industry. Historical and contemporary treatments of the development of industry, particularly as they affect Australia and neighbouring countries. Philosophical treatment by critical comparisons of various theories as they purport to model industrial practices. Possible extrapolations into the future.

The learning situation will include the use of audio/video and film. Students will be required to deliver a class paper as well as to participate actively in the seminar-type learning situation. Evidence of active reading in mutually agreed areas will be required.

**References**


Ehrlich, P. and Harriman, R.L. *How to be a Survivor*. Lond., Pan/Ballantine, 1971

Fuller, R.B. *Utopia or Oblivion: the Prospects for Humanity*. Lond., Allen Lane, 1970


**Human engineering**

A course of ninety hours extending over five decaweeks. Considerations of the human factors in engineering systems. Studies of human characteristics, capabilities and limitations. Conceptual, designing, manufacturing and operational considerations applied to man-machine systems with a view to achieving compatibility between all elements of the system, including the people involved.

**References**


**Industrial economics**

A course of forty hours extending over the first two decaweeks. Considerations of alternative ways of controlling economic variables to regulate levels of employment, production and income with particular reference to Australia and nearby countries. Economic aspects of the development and resolution of industrial disputes.

**References**


**Production methods**

A course of eighty hours operating in two groups of two decaweeks. Principles of material cutting and forming. Studies of manufacturing methods, machines and systems arising from these and other principles. Principles of measurement and studies of metrological instruments. Applications to selected examples of actual machines, instruments and systems.

**References**


**Work study**

A course of forty hours extending over the first two decaweeks. Considerations of the principles of method study and work measurement. Applications to industrial situations both in the planning and the operational stages with particular reference to practices in Australia and nearby countries.

**References**


EM505 Materials and Processes
Three hours per week for two semesters
A subject in the graduate diploma course in maintenance engineering.
Processes for maintenance and repair associated with equipment restoration; rebuilding and repair of components and structures. Outcomes of the use of incorrect materials from the point of view of strength, fatigue, rigidity, vibration, wear and resistance to hostile environments.
Studies are based on actual cases occurring in industries in which students are employed. Use is made of visits to industry with associated seminars.

EM506 Maintenance Planning and Control
Three hours per week for two semesters
A subject in the graduate diploma course in maintenance engineering.
Requirements of a rationally established maintenance department. Techniques for determining optimal strategies. Development of planning, programming, controlling and evaluating quantitatively determined maintenance schedules.

EM507 Maintenance Engineering I
Four hours per week for two semesters
A subject in the graduate diploma course in maintenance engineering.
Mechanical phenomena of vibration, fatigue, wear, corrosion and lubrication related to maintenance technology. Breakdown caused by mechanical failure. Prediction methods, reliability techniques and standardisation methods. Human factors in maintenance engineering, safety, first aid, codes and regulations related to maintenance. Illustrations are drawn from industrial areas. Design for maintenance and feedback of in-service experiences is emphasised.

EM508 Maintenance Engineering 2
Four hours per week for two semesters
A subject in the graduate diploma course in maintenance engineering.
Application of maintenance technology to principal types of industrial and commercial classes of plant and equipment. Emergency maintenance specifically related to faults, repairs and contingency measures. Installation, commissioning and verification of new plant and equipment. Environmental and pollution problems and solutions.

EM524 Energy Resources and Conversion
Four hours per week for one semester
A subject in the graduate diploma course in energy systems.

References

EP315 Production Technology
Fifty-four hours
Assessment by assignments and tests (tests not greater than 5% of total hours)
A third-year subject in the degree course in manufacturing engineering.

References
Galyer, J.F.W. and Shotbolt, C.R. Metrology for Engineers — S.I. Units. 3rd edn, Lond., Cassell, 1969
Haslehurss, M. Manufacturing Technology. Lond., English Universities Press, 1972
Rowe, G.W. Elements of Metalworking Theory. Lond., Arnold, 1979

EP321 Engineering Administration
Fifty-four hours
Assessment by satisfactory completion of class assignments and rests
A third-year subject in the degree course in manufacturing engineering.
Historical background to industrial management is followed by a brief treatment of the classical management theory. Organisation of enterprises is related to the factors affecting its operation. Financial aspects are introduced — funding, costing, etc. State and federal legislation affecting industry — arbitration, compensation, labour and industry, etc. Basic psychology is supplemented with the fundamentals of personnel management — leadership, supervision, recruitment.

References
Byrt, W. and Masters, P.R. The Australian Manager. Melb., Sun Books, 1974

EP325 Industrial Management
Fifty-four hours
Assessment by test and class assignments
A fourth-year subject in the degree course in manufacturing engineering.
Managerial economics — financial management of assets; profit/volume relationships; product and investment appraisal: the Australian environment. Accounting — costing, budgeting: the balance sheet; the profit and loss account; analysis of performance. Philosophy and psychology in industry — environmental and hereditary influences; relationship to the personnel function with particular reference to Australia.

Recommended text

EP326 Engineering Administration
Thirty hours
Assessment by test and assignments
A third-year subject in the degree course in electrical engineering (1976 syllabus) which gives a brief outline of the development of modern management theory and practices. Organisation of enterprises — their needs and their structures. Elements of human behaviour and the fundamentals of leadership and supervision.

During the industry training semesters, students may attend group seminars, but will be provided with printed notes and other reference material to enable them to complete the subject externally by assignments.

References
As for EP322.

EP331 Industrial Engineering
Sixty hours
Assessment by test and class assignments
Work study: history and origins; applications and objectives of: human aspects; definitions and terminology. Work simplification; method study; techniques of recording; principles of motion economy; applications and objectives of: co-ordination with work measurement. Work measurement: relationship with method study; techniques used to obtain standard and allowed times; work unit values; rating procedures application of allowances. Application of work study to: planning; scheduling; loading, plant layout; materials handling, etc. Labour cost controls; incentive schemes; plant utilisation and efficiency, job evaluation.

References
For references and recommended text see entry for EP335.

EP332 Industrial Engineering
Sixty hours
Assessment by test and class assignments
Production management as related to the manufacturing process: factors of; management techniques; methods of production; planning procedures; processes of control; documentation and control procedures; costing procedures; analysis and interpretation of procedures; machine selection and replacement procedures; discounted cash-flow techniques. Modern trends; principles of automatic controls, effects of automation; computer control of production; introduction to operational research techniques as applied to production; network planning techniques.

Recommended text

References

EP335 Industrial Engineering
Fifty-four hours
Assessment by test and class assignments
A fourth-year subject in the degree course in manufacturing engineering involving a study of the principles and techniques of methods study and work measurement, human engineering and value analysis. The course will consider classical work study techniques and their application in industrial situations generally and production management in particular. Allied topics such as incentives, job evaluation and labour costs control are incorporated. Theoretical lecture work will be complemented by selected films, discussion and suitable practical work.

Recommended text

References

EP335 Design for Manufacture
Ninety hours
Assessment, tests, assignments and projects
A fourth year subject in the degree course in manufacturing engineering.


References
American Society of Tool and Manufacturing Engineers (ASTME): Tool Engineers Handbook. 2nd edn, N.Y., McGraw-Hill, 1959
American Society of Tool and Manufacturing Engineers (ASTME): Handbook of Fixture Design. N.Y.,
British Standards Institution
BS4500: ISO Limits and Fits. 1969-73
BS308: Engineering Drawing Practice. 1972
Thomas, L.F. The Control of Quality. Lond., Thames & Hudson, 1965
Standards Association of Australia.
AS B195: Plain Limit Gauges. Limits and Tolerances. 1962
Standards Association of Australia.

EP356  Design for Manufacture
117 hours
Assessment, tests, assignments and project
A third-year subject in the degree course in manufacturing engineering.
References
As for EM354 and EP354 plus

EP414  Systems Engineering
Fifty-four hours
Assessment by tests and assignments
A fourth-year subject in the degree course in manufacturing engineering (production technology stream).
Basic control theory: definition; classical and modern control theory, linear and non-linear systems, open-loop and closed-loop systems, lumped parameter systems, distributed parameter systems, stationary and stochastic systems, sample-data systems, optimal systems. Analysis of linear systems using s-plane theory and frequency response methods: Root-locus, Nyquist diagrams and Bode plots.
Applications: computer process control; modelling, system identification and optimisation.
Production control system: processing, operations planning, inventory planning and control, process scheduling, despatching and progress control.
References

EP415  Production Technology
Sixty-three hours
A fourth-year subject in the degree course in manufacturing engineering (production technology stream).
Machine tools: modern capability, functional requirements, assessment of static and dynamic characteristics. Introduction to machine tool vibration. Deformation mechanics; further study of chip formation, tool life and testing, machineability, economic factors, analytical models. In-depth study of mathematical models and slip line field to forming and cutting. Relationship to industrial processes.
References
Galyer, J.F.W. and Shotbolt, C.R. Metrology for Engineers — SI Units. 3rd edn, Lond., Cassell, 1969
Haslehurst, M. Manufacturing Technology. 2nd edn, Lond., English Universities Press, 1972
Rowe, G.W. Elements of Metalworking Theory. Lond., Arnold, 1979

EP421  Applied Statistics and Operational Research
Sixty hours
Assessment by test and class assignments
A subject in the graduate diploma course in industrial management.
Statistics: frequency-distribution; distribution of means, confidence levels and tests for significance; probability theory, quality control. Operational research: origins and history of general principles and techniques as applied to management, mathematical programming; linear programming; inventory control techniques; queuing theory; simulation; replacement theory, network analysis.
References


**EP422 Engineering Administration**
Sixty hours
Assessment by tests and class assignments

An introductory subject in the graduate diploma course in industrial management.


References
Byrt, W.J. and Masters, P.R. *The Australian Manager*. Melb., Sun Books, 1974


**EP423 Financial Aspects of Industrial Management**
Sixty hours
Assessment by examination and class assignments

A subject in the graduate diploma course in industrial management.


References


**EP424 Human Relations in Industry**
Sixty hours
Assessment by examination and class assignments

A subject in the graduate diploma course in industrial management.

General psychology and the individual, awareness and interpretation of the environment; motivation and behavioural patterns. Industrial psychology: individual differences; selection and training of employees; physical conditions of work. Social psychology of groups; behaviour patterns; morale; group leadership. Industrial relations machinery; trade unions; employees’ associations, conciliation and arbitration: collective bargaining. Job enrichment and participation.

Recommended text

References


Fraser, J.M. *Psychology: General Industrial*. Social. 3rd edn, Lond., Pitman, 1971


**EP425 Legal Aspects of Industrial Management**
Sixty hours
Assessment by a three-hour examination

An optional subject in the graduate diploma course in industrial management.

Introduction: industrial law and its relation to general law: Australian law and its relation to English law, powers and organisation of Australian courts, contract law as it applies particularly to employment, selling and to industrial projects. Commercial and company law as it applies particularly to principal and agent, insurance, negotiable instruments, taxation, company formation, etc.

Factory law and allied topics. Conciliation and arbitration law. Restrictive trade practice.

References


**EP426 Management Practice**
Ninety hours
Assessment: there will be no examination in this subject but the work done by students throughout the course will be assessed for examination purposes. Several assignments are submitted.

A subject in the graduate diploma course in industrial management which is designed to draw together the benefits gained from the fundamental management topics. It also aims to develop further each student’s understanding in the fields of personal relationships, thinking, research and communications with the use of case histories, lecturettes, management games, etc.

Present management practices and some likely future trends are discussed. This subject is taken in the final year of the course. Emphasis is placed on marketing and personnel aspects not covered in the course.
Recommended text
Drucker, P.F. Management. Lond., Pan, 1979

References
Drucker, P.F. Management: Tasks, Responsibilities, Practices. Lond., Heinemann, 1974
Hamblen, J.W. Management by Objectives. Lond., Gower Foundation, 1972
Yuill, B. Developing Managers in Organisations. Syd., Wesley, 1975

EP431 Production Management
Sixty hours
Assessment by examination and class assignment

An optional subject in the graduate diploma courses in industrial management and manufacturing technology.

The subject covers aspects of production management as related to the manufacturing process. Production: factors of; management techniques; methods of production; processes of control; documentation and control procedures; costing procedures and analysis of; planning procedures; machine selection and replacement. Modern trends: principles of automatic controls; effects of automation; computer control of production; operational research techniques as applied to production. Group technology.

References
As for EP332.

EP432 Work Study
Sixty hours
Assessment by test and satisfactory completion of class assignments

An optional subject in the graduate diploma courses in industrial management and manufacturing technology.

The subject covers the history, principles and objectives of work study. Method study and work simplification: techniques and applications. Work measurement: techniques and applications. The course will include a brief appreciation of allied topics: plant layout, wage incentives, job evaluation, etc.

References
As for EP335.

EP435 Physical Distribution Management
Sixty hours
Assessment by assignments, case studies and tests

An optional subject in the graduate diploma course in industrial management which covers the planned scientific approach to decision-making in the areas of site selection, distribution, packaging, materials handling, etc.

Operations research techniques are applied to warehousing, inventory systems, forecasting systems, ordering systems. Evaluation of materials handling plant. Comparison of transportation systems.

References
Attwood, P.R. Planning a Distribution System. Lond., Gower Press, 1971
Gilmour, P. ed. Physical Distribution Management in Australia. Melb., Cheshire, 1974
Smykay, E.W. Physical Distribution Management. 3rd edn, Lond. & N.Y., Macmillan, 1973

EP436 Environmental Studies
Sixty hours
Assessment by project and test

An optional subject in the graduate diploma courses in industrial management and manufacturing technology.

Ecology and the effects of environmental imbalance. A detailed examination of the managerial implications of air, water and earth pollution. Noise and waste legislation. Preventive measures. A large segment of the course is devoted to the completion of an appropriate project.

References
Meadows, D. Limits of Growth. Lond., Earth Island, 1972

EP515 Production Technology
Sixty-three hours including laboratory
Assessment by test and assignments

A final-year subject in the degree course in manufacturing engineering (production technology stream).

Recent processes in production technology, e.g. numerical control, CAM, EDM, ECM, lasers etc. (reflecting current departmental interest). Machine tools: analytical models for vibration of machine tools, vibration isolation and damping, self-induced and forced vibration, chatter, instability.

Deformation mechanics: oblique cutting, high speed machining, multi-point tools, economics. Load bounding solutions to metal forming and cutting including axisymmetric problems, extension of mathematical models to inhomogeneous deformation.

References
As for EP415.
**EP525 Industrial Management**

Fifty-four hours

Assessment by test and assignments

A final-year subject in the degree course in manufacturing engineering.

Legal aspects: contract law, employer/employee relations, buyer/seller relations, industrial legislation.

Industrial relations: arbitration and collective bargaining, trade unions, wage administration, job enrichment.

Industrial psychology, personnel assessment and evaluation, working conditions, modern theories, ethics.

References

Andreatta, H. and Rumbold, B. *Organisation Development*. Melb., PPCA, 1976

Australian Department of Labour, *Job Enrichment and Job Satisfaction*. Canberra, AGPS, 1974


**EP526 Elective**

Forty-five hours

Assessment by tests and class assignments

A final-year subject in the degree course in manufacturing engineering (production technology stream) which is chosen by the student group from subjects offered by other departments, including Art, Business and Arts.

References

A list of suitable references will be provided at the commencement of the course.

**EP535 Industrial Engineering**

Fifty-four hours

Assessment by tests and assignments

A final-year subject in the degree course in manufacturing engineering which involves a study of the principles and practices of the planning and control function in production organisations with particular emphasis on the use of quantitative and analytical procedures for the solution of problems. The range of problem areas will include plant location, plant and factory layout, transportation, maintenance, equipment replacement, economic batch sizes, network planning, resource allocation, stock control, line balancing and machine interference. Theoretical lecture work will be complemented by selected films, discussions and suitable practical work.

**EP555 Design for Manufacture**

Ninety hours (includes a thirty-six hour project in industry)

Assessment, tests, assignments and project

A final-year subject in the degree course in manufacturing engineering.

Automation in manufacture, theory and practice; linear, sequential, closed loop, open loop, electrical, mechanical, pneumatic, hydraulic systems. Industrial applications; new and modernised plant. Design of machine tools and presses; kinematics, motion analysis, dynamics. Design of elements; stiffness and rigidity, bearings and slides. Optimisation of parameters in design. Computer-aided design; use of computers in engineering analysis and design, simulations.

**EP556 Manufacturing Systems**

140 hours

Assessment, project report

A final-year subject in the degree course in manufacturing engineering (production technology stream) which is designed to give an inter-disciplinary approach towards the application of relevant knowledge from the whole field of production engineering to the establishment of a manufacturing system. It is intended that students should prepare for this subject during their last period in industry. Wherever possible, students are expected to apply their knowledge to the study of a genuine industrial case. This work, which will be assessed, may also include an applicable experimental project.

**EP611 Metal Working Technology**

Ninety hours

Assessment, tests, assignments and laboratory work

A subject in the graduate diploma course in manufacturing technology.

Background metallurgy: necessary atomic structure, dislocation theory and slip, effects of hot and cold working, strain and strain rate effects. Stress/strain and basic introduction — basic laws, curves, obtaining stress/strain data, yield criteria, empirical data approach, flow rules. Friction and lubrication: mechanism, friction tests. Mathematical modelling: selection of metal-working processes to demonstrate the use of flow rules, yield criteria, friction models, stress state and practical applications of theories. Empirical methods: plant and die design, estimation of force, work and pressure from
empirical data (application to processes as mathematical models). Slip-line field: slip-line field theory, applications to plane strain problems, comparison of techniques, use in metal cutting, redundant work, friction. Load bounding: upper bound approach (shear, friction and deformation power), redundant work, application to processes, extension to approximations, axial symmetry.

References

**EP612**  
**Polymer Processing Technology**  
Ninety hours  
Assessment, tests, assignments and laboratory work

A subject in the graduate diploma course in manufacturing technology.

This subject will give some insight into plastics and rubber materials and their processing. Particular emphasis will be placed on compounding, fabrication into finished products, and the influence of the polymer/compound used, the processing method and the design on product quality and economics.

Structure and properties of plastics and rubber: polymer structure and transition phenomena, important mechanical, physical and chemical properties, melt rheology, characterisation, testing and evaluation, material range and cost. Additives, compounding and composites: additives for crosslinking, plasticisation, reinforcement, stabilisation and pigmentation, compounding methods, composites, cellular materials.

Processing, fabrication and conversion: details of all important processes, with emphasis on extrusion and injection moulding, effects of processing on plastic and rubber properties, common problems and products defects, finishing, assembly and decoration, re-processing and waste handling, quality control. Product design and choice of material and manufacturing route: comparative polymer (and non-polymer) property and costing data, product requirements, design and best manufacturing route, assignment to design a complete manufacturing system for a particular-component.

References
Blow, C.M. *Rubber Technology and Manufacture*. Lond., Newnes-Butterworths, 1971

**EP613**  
**Manufacturing Systems**  
Ninety hours  
Assessment, tests, assignment and laboratory work

A subject in the graduate diploma course in manufacturing technology.

Systems engineering, batch and mass production, automated assembly, transfer machines, machining centres, group technology systems. Numerical engineering: numerical control, direct and computer numerical control, adaptive control, computer languages, economic and organisational aspects of numerical control, computer-aided manufacture. Modelling techniques: system identification, control and optimisation. Industrial dynamics: forecasting, operations planning, inventory and planning control, operations scheduling, dispatching and progress control.

References
Burbridge, J.L. *The Introduction of Group Technology*. Lond., Heinemann, 1975
Savas, E.S. *Computer Control of Industrial Processes*. N.Y., McGraw-Hill, 1965

**EP621**  
**Experimental Design and Instrumentation**  
Sixty hours  
Assessment, tests, assignments and laboratory work

An optional subject in the graduate diploma course in manufacturing technology.


Experimental design: applications of randomisation, blocking, confounding, transformation, replication, block designs, factorial and fractional methodology, evolutionary operation.

Reference

**EP662**  
**Industrial Health**  
Thirty hours  
Assessment by assignments

An optional subject in the graduate diploma course in manufacturing technology.

This subject develops an awareness in students of an engineer's responsibility to the workforce and society, in the design of production or manufacturing plant. The method of teaching will be by group activity with guest lecturers where necessary.

Introduction: resume of legislation and regulations in the factory environment; the financial implications of poor industrial health policies in the factory. Selected topics by group methods: ionising radiations, noise, dust, light, heat and cold, toxic materials, exhaust emission, cutting fluids, effects on health, mechanism, control, treatment.

Reference
EP623 Joining Technology

Thirty hours
Assessment by assignments and laboratory work

An optional subject in the graduate diploma course in manufacturing technology.

This subject gives an overview of methods of joining and fastening available. In the course, exercises are carried out in which students determine the feasibility of several different methods of assembly in a particular case.


References

EP624 Oxide Technology (Glass)

Thirty hours
Assessment by assignments

An optional subject in the graduate diploma course in manufacturing technology.

In this subject the processing, selection and economics of commonly used glasses are examined.

Glasses: raw materials preparation and selection, melting and re-use of scrap, forming, types of glass and selection for products, furnaces.

Reference

EP625 Oxide Technology (Ceramic and Refractory)

Thirty hours
Assessment by assignments

An optional subject in the graduate diploma course in manufacturing technology.

This subject complements EP624 Oxide Technology (Glass) and considers the selection and processing of clay products, advanced ceramics and 'cermets'.


Reference

EP626 Sheet Metal Technology

Thirty hours
Assessment, tests, assignments and laboratory work

An optional subject in the graduate diploma course in manufacturing technology.

This subject is intended to complement EP611 Metal Working Technology.


References
Rowe, G.W. Principles of Industrial Metal Working Processes. Lond., Arnold, 1977

EP627 Low Cost Automation

Thirty hours
Assessment by assignments

An optional subject in the graduate diploma course in manufacturing technology.

This subject provides students with a basic understanding of low cost automation and its place in manufacturing industry. Students are able to design systems and compare the effectiveness of alternative methods.

Introduction to the concept of low cost automation (LCA): conversion from manual to automatic operation, examples of transition from manual to automatic control. Components of LCA: types of automation (e.g. feedback, sorting, etc.), classification of LCA components. Logic design and basic functions: logic functions, how to use logic in design. Comparison of systems: comparison of electrical, electronic, fluidic, pneumatic, mechanical and hybrid systems. Applications in industrial processes: materials handling, inspection, assembly, storage, machine tools. Economics of LCA: automation and reliability, automation and economics, automation and labour.

Reference

EP628 Quality and Reliability Engineering

Thirty hours
Assessment, tests, assignments and laboratory work

An optional subject in the graduate diploma course in manufacturing technology.

This subject provides students with an introduction to and basic understanding of the techniques used in the quality and reliability functions of an industrial operation.

Statistical quality control: the concept of statistical control, process control charts for variables – control charts for mean and range; cu sum approaches; process capability, process control charts for attributes – control charts for number defective, concept of acceptance
sampling, acceptance sampling by attributes; operating characteristics, curves, single, double, multiple and sequential sampling plans, acceptance sampling by variables; range and standard deviation methods, published plans, economy of acceptance sampling.

Reliability: definition of terms, the life characteristic, reliability prediction and testing, design and analysis of life tests, analysis of service return, graphical methods, e.g. Weibull, systems reliability, Bayes' theorem, the use of redundancy design for reliability. Terotechnology: definition, fields of application, plant design and maintenance, replacement theory, maintenance policies, commissioning, monitoring and diagnostics.

Reference:

GS493 General Studies
Three hours per week for one semester
Assessment is continuous

A fourth-year subject in the degree course in manufacturing engineering.

The course seeks to encourage the student to be an on-going self-teacher. To this end the content is eclectic with a strong psychological and self-development bias. Topics covered will include technological and social change and individual adjustment to this change, psychologica: aspects of communication, thinking with concepts, divergent and convergent thinking, defence mechanisms and early-learning experience, conflict and anxiety, marriage, family and inter-personal relations with application of the family paradigm to relations in industry.

The learning situation will include the use of audio/video and film. Students will be required to deliver a class paper as well as to participate actively in a seminar-type learning situation. Evidence of active reading in mutually agreed areas will be required.

Preliminary reading
There is no prescribed preliminary reading.

ME119 Engineering Principles: Mechanics
Two hours per week for two semesters

A first-year subject in the associate diploma course in production engineering.

Topics include kinematics, forces, couples and moments, friction, Newton's laws.

ME125 Thermodynamics and Heat Transfer
Two hours per week for two semesters

A first-year subject in all degree courses in engineering.

The syllabus deals with: the working substance, factors of state and properties, PVT relations for the solid, liquid and vapour phases; perfect gases; energy systems, closed and open; first law, energy equations, internal energy, enthalpy; reversibility; heat transfer — one-dimensional conduction including heat generation, conductivity, Fourier equation; convection, natural and forced; Newton's law of cooling, overall coefficients; radiation — small body in large enclosure.

Applications to plant and equipment common to a wide spectrum of engineering endeavour. Selected topics of interest and importance to all engineers; solar energy, motor vehicle emissions, power plant, engine modification and tuning, thermoelectricity, heat sinks, heat pumps, refrigeration and air-conditioning, heat exchangers.

References:
Eastop, T.C. and McConkey, A. Applied Thermodynamics for Engineering Technologists — S.I. Units. 2nd edn, Lond., Longmans, 1967
Joel, R. Basic Engineering Thermodynamics in S.I. Units. 3rd edn, Lond., Longmans, 1971
Wallace, F.J. and Linning, W.A. Basic Engineering Thermodynamics — S.I. Units. 2nd edn, Lond., Pitman, 1970

ME129 Engineering Principles: Heat
One hour per week for two semesters

A first-year subject in the associate diploma course in production engineering which provides a descriptive treatment of the transfer of heat and the use of heat to create mechanical work. Topics include properties of working substances, heat transfer, reciprocating machinery.

ME165 Mechanical Engineering Systems
Two hours per week for one semester

An elective subject in the first year of all engineering degree courses which aims to retain and develop natural interests and skills pertinent to engineering careers and to introduce engineering concepts regarding components and systems approaches.

The syllabus deals with: interaction and matching of component characteristics, system specification, planning, time and cost constraints, applied research, installation, assessment, experimental organisation, instrumentation, commissioning, documentation, debugging, modification and development; applications to functional design, mechanisms, human engineering, energy, information flows, control, power transmission and other areas.

Students are given the opportunity to be involved in realistic engineering concepts, techniques and procedures through a selection of small projects. Typical examples involve work in solar energy, aero: energy, motor vehicles, engines, environmental problems, compressed air, power plant, pumps, fans, turbines, hovercraft, aircraft, marine engineering, hydraulic plant, environmental heating, ventilation, air-conditioning and refrigeration.

ME211 Applied Mechanics
Five hours per week for two semesters, including lectures and laboratory/tutorial work.

A second year subject in the degree course in mechanical engineering.
The syllabus is divided into three parts: Machines
A course of sixty hours involving treatment of rigid body dynamics, circular motion, combined linear and angular systems, impulse and momentum, work and energy.

Solid mechanics
A course of sixty hours involving treatment of strain and stress, strain measurement, deflection due to bending, shear flow, torsion and shear centre, introduction to statically indeterminate systems.

Fluid mechanics
A course of thirty hours involving treatment of fundamental fluid concepts, fluid statics, fluid dynamics, steady incompressible fluid flow.

ME219 Applied Mechanics
Five hours per week for two semesters, including lectures and laboratory/tutorial work.

A second year subject in the degree course in manufacturing engineering.

The syllabus is divided into three parts:
Solid mechanics
A course of sixty hours involving treatment of combined loading, differential methods of beam analysis, Mohr’s circle for bi-axial stress, strain gauging, stress concentration, fatigue, dynamic stresses, dimensional analysis.

Machines
A course of sixty hours involving treatment of linear and angular systems, conservation of energy and momentum, impulse, free and forced single degree of freedom vibration.

Fluid mechanics
A course of sixty hours involving treatment of fluid properties, fluid statics, fluid dynamics, measuring devices, boundary layers, flow and pressure drop in pipes, the external characteristics of pumps.

ME221 Energy Systems
Three hours per week for two semesters including lectures and laboratory/tutorial work.

A second year subject in the degree course in mechanical engineering.

The syllabus is divided into two parts.

Thermodynamics
This course involves treatment of thermodynamic systems and working fluid properties, unsteady flow, the second law of thermodynamics and corollaries, entropy and reversibility, availability of low grade energy, gas power cycles and internal combustion engine plant, vapour power cycles and steam plant, heat transfer: unsteady state conduction, radiation.

Electronics
This course involves basic circuit theory, transfer functions, Bode diagrams, modern electrical devices such as operational amplifiers, analogue and digital devices and convertors, binary arithmetic combination and sequential logic, integrated circuits, counters, shift registers, clocks and arithmetic units.

ME231 Instrumentation and Control Systems
Two hours per week for one semester including lectures and laboratory/tutorial work.

A second year subject in the degree course in mechanical engineering.

This course involves treatment of general requirements of measurement and instrumentation in mechanical engineering plant, selection and use of appropriate instruments, matching of component characteristics within a system including those of simple control devices.

ME241 People-environment Systems
Two hours per week for two semesters including lectures and laboratory/tutorial work.

A second year subject in the degree course in mechanical engineering.

This course involves treatment of human factors in engineering systems, people-environment systems, human characteristics: capabilities and limitations, leadership and supervision, structural organisation, administrative procedures.

ME261 Engineering Practices
Three hours per week for two semesters including lectures, workshop and industrial visits.

A second year subject in the degree course in mechanical engineering.

This course involves treatment of the role of trades and practices, industrial safety, machine shop, welding and fabrication, plumbing and sheetmetal, electrical systems.

ME271 Design for Industry
Three hours per week for two semesters including lectures and practical work.

A second year subject in the degree course in mechanical engineering.

This course involves treatment of graphical techniques and applications, design methodology, modelling of design systems, design analysis of components, features and applications of mechanical components, simple mechanical systems, selection, analysis, specifications.

MP101 Engineering Drawing
Three hours per week for two semesters Assessment by assignments, tests and examination

A first-year subject in all engineering degree courses

The course is designed to provide basic knowledge of the fundamental principles of engineering drawing — standards, conventions, practices and procedures — as applicable to the general field of engineering. Studies and exercises cover principles, various types of engineering drawings, conventional representation and specification in engineering, techniques in simple design and drawing office systems. Through a series of elective topics the general principles are extended to cover the specialised methods and drawing requirements in particular fields of engineering.
References
A list of references, standards and texts together with printed notes is provided by lecturers.

MP102 Engineering Practices and Processes
Two hours per week for two semesters
Assessment, examination and projects
A first-year subject in all engineering degree courses which provides an introduction to as wide a range of fabrication processes as possible and the engineering language associated with these processes. The subject provides practical experience of skills associated with some of these processes, within the resources available. The student is introduced to the engineering profession generally.

Textbook

MP103 Engineering Drawing and Graphics
Four hours per week for two semesters
A first-year subject in the associate diploma course in production engineering which is designed to equip students with the basic skills in technical sketching, engineering drawing, descriptive geometry, graphical problem-solving, and data presentation.

MP104 Engineering Processes
Four hours per week for two semesters
A first-year subject in the associate diploma course in production engineering which provides an introduction to a wide range of practices. Approximately sixty hours is involved in 'hands on' work in workshops within the college, thirty hours is spent on plant visits covering a broad selection of engineering industries, and the remaining time is used in explanation of the processes.

MP105 Engineering Tutorial
Three hours per week for two semesters
A first-year subject in the associate diploma course in production engineering which includes tutorial exercises, data processing, and formal communication studies.

MP181 Engineering Science: Materials
Two hours per week for two semesters
A first-year subject in the associate diploma course in production engineering aimed at providing a qualitative appreciation of the properties of materials and in particular the way in which these properties influence the selection and use of materials. Topics include metals, ceramics, polymers, mechanical properties, selection and shaping.

MP191 Manufacturing Engineering Elective
Two hours per week for one semester
Assessment, projects and reports
An elective subject in the first year of all engineering degree courses. Through a series of lectures and plant visits students develop an understanding of the scope and nature of Australian manufacturing industry, its place in the national economy, and the role of engineers in various aspects of manufacturing.

MP211 Manufacturing Technology
Three hours per week for two semesters
Assessment by assignments
A second year subject in the degree course in manufacturing engineering.

References

MP231 Industrial Engineering
Two hours per week for one semester
Assessment by tests and class assignments
A second year subject in the degree course in manufacturing engineering.
History, theory and practice of methods study and work measurement-principles, definitions, symbols and terminology.
Introduction to charting techniques; time study; improvement procedures. Elements of activity sampling and predetermined measurement systems.
Standard performance and reward concepts. Applications of work study to manufacturing.

Recommended Text
Reference

MP251 Design for Manufacture
Three hours per week for two semesters
Assessment by assignments
A second year subject in the degree course in manufacturing engineering which introduces designing for manufacturing and design to suit manufacturing technique. Basic machine design.
MP281 Engineering Materials
Three hours per week for two semesters.
Assessment by assignments and examination.
A second year subject in the degree course in manufacturing engineering.
An extension of the work done in first year Chemistry to consider the science and technology of some materials as a basis for later work in Manufacturing Technology and Design for Manufacture. Structure, properties and treatment of: metals, ferrous and non-ferrous; polymers, thermoplastics, thermosetting elastomeric; ceramics — crystalline and non-crystalline; composite systems. Welding and joining systems. Tribology.

MP282 Engineering Materials
Two hours per week for one semester.
Assessment by assignments and examination.

MP283 Engineering Materials
Three hours per week for one semester.
Assessment by assignments and examination.

MP284 Engineering Materials
Three hours per week for one semester.
Assessment by assignments and examination.
A second year subject in the degree course in mechanical engineering. Extends the work covered in first year chemistry to the characteristics of materials of particular importance in mechanical engineering. Structures, properties and treatment of ferrous and non-ferrous metals, polymers and compounding corrosion thermodynamics and kinetics, tribology, bearing and friction materials.

MT415 Materials Technology

MT515 Materials Technology
A fifth-year subject in the degree course in manufacturing engineering (materials technology stream). Plastics: thermof orm ing; calendering, coating techniques, fibreglass reinforced plastic, rubber product manufacturing, cellular plastics, joining methods, decoration, waste handling, testing and quality control; design, and choice of material and manufacturing route. Metals: deformation mechanics, vibrations and isolation; sheet metal forming; production welding. Ceramics: consideration of clay product production line and equipment, furnace types and economics of various arrangements; extension of glass forming. Consideration of the application of C.A.M.

SA296 Physical Science
Two hours per week for two semesters.
Assessment is continuous.

SC113 Engineering Science: Chemistry
Two hours theory per week for two semesters.
Faculty of Engineering

SC194 Chemistry
Three hours per week for two semesters.
A first-year subject in all degree courses in engineering which provides students with an appreciation of the chemistry forming the background of engineering studies and practices. The course will be treated so that students are able to recognize its relevance to engineering.

Review of preliminary principles, energy, equilibrium, electrochemistry, organic and inorganic chemistry, materials structure and properties — metals, polymers and ceramics; mechanical properties, fuels and combustion.

Textbook
De Garmo, E.P. Materials and Processes in Manufacturing. 5th edn, Lond., Collier Macmillan, 1979

References

SC327/328 Chemistry
Five hours per week for two semesters — two hours lectures, one hour tutorial, two hours practical
A final-year subject in the diploma course in chemical engineering. Aspects of chemistry studied include the investigation of the principles and feasibility of chemical reactions as proposed, or used, in chemical processes and chemistry relevant to process control. Topics are: statistical mechanics, kinetics, surface and colloid chemistry, radio and radiation chemistry, spectroscopy and electrochemistry including a more advanced study of corrosion. Practical work is done in conjunction with the chemical engineering department.

Recommended reading
Adamson, A.W. Physical Chemistry of Surfaces. 2nd edn, N.Y., Wiley, 1967
Rushbrooke, G.S. An Introduction to Statistical Mechanics. Lond., Oxford University Press, 1967

SC572 Microbiology
Three hours per week for two semesters
Practical work for this subject must be taken by students taking the graduate diploma course in biochemical engineering.
All students should have passed SC582 Engineering Biochemistry or be studying it concurrently
Assessment is made on the basis of a final examination

This subject is designed to provide basic instruction in the techniques and methods of microbiology. Areas covered include microscopy, sterilisation and antiseptics, microbial anatomy, physiology and growth, and systematics. Basic material is developed to illustrate the use of micro-organisms in processes such as fermentation, food processing and analysis, antibiotic assays, cheese production and other selected aspects of microbiology relevant to Australian industry. Practical work is designed to show the essential features of each of the above areas. Emphasis is placed on developing the manipulative skills required to handle microbes and to maintain sterile conditions.

References
Topley, W.W.C. and Wilson, G.S. Principles of Bacteriology. 2 vols. 5th edn, Lond., Arnold, 1964

SC327/328 Engineering Biochemistry
Three hours per week for two semesters
Practical work associated with this subject is not taken by students taking the graduate diploma course in biochemical engineering.
Assessment is based on semester examinations and assignments

A subject in the graduate diploma course in biochemical engineering in which the following areas are studied: bioenergetics; structure-function relationships of biological compounds; catabolic and anabolic pathways; integration of metabolism; enzyme kinetics; fermentation biochemistry; industrial enzymes; industrial genetics.

References
SC583  Physical Biochemistry
Two hours per week for two semesters
Prerequisite: SC582 Engineering Biochemistry
Assessment is by progressive tests and assignments.
A subject in the graduate diploma course in biochemical engineering which is intended to give an understanding of the basic theory of several techniques and to apply these to biochemical problems. Topics covered include molecular weight determination, optical rotatory dispersion, X-ray crystallography, spectroscopy, isotopes and enzyme kinetics.
Reference

SK194  Computations
Two hours per week for one semester
A first-year subject in the degree course in mechanical engineering which introduces students to advanced computer programming methods. Structured programming, algorithmic processes, architecture of large scale computers, introduction to machine language programming, sub-routines and macros, assemblers, linkers and loaders; elementary list processing techniques.

SK294  Computer Programming
One hour per week for one semester
A second-year subject in the degree course in electrical engineering which introduces students to advanced computer programming methods. Practical programming experience of BASIC and/or FORTRAN and application to simple problems in production engineering. Students will be expected to complete several programming assignments. These will involve writing programs and using or modifying existing programs.

SK296  Computer Programming
One hour per week for one semester
A second-year subject in the degree course in manufacturing engineering which provides practical programming experience of BASIC and/or FORTRAN and application to simple problems in production engineering. Students will be expected to complete several programming assignments. These will involve writing programs and using or modifying existing programs.

SK298  Computer Programming
One hour per week for two semesters
A second-year subject in the degree course in mechanical engineering which instructs students in languages and procedures relating to computer usage so that subsequently they may use computers as engineering tools for computations and simulations. Instruction and practice in a high level language, BASIC; other languages; simulation packages, use of pre-programmed libraries, discussion of data base management systems, low level languages.

SK390  Computer Programming
One hour per week for one semester
A third-year subject in the degree course in civil engineering which extends students' knowledge of the application of computers in solving engineering problems. Advanced aspects of FORTRAN or other suitable languages, including sub-routines, non-numeric applications and file-handling on magnetic media. The course has a strong emphasis on practical work and students will be expected to devise suitable programming projects which are associated with their course.

SK427  Computer Applications
Three hours per week for one semester
Practical programming work
Assessment is by progressive tests and assignments
A fourth-year subject in the degree course in manufacturing engineering which consists of a selection from: algorithms and algorithmic processes, advanced FORTRAN and BASIC programming; an introduction to COBOL programming, special purpose languages, numerical control of machine tools, process control and simulation: the use of linear programming, PERT, Monte Carlo, dynamic programming and other techniques in the resolution of engineering design problems.

Textbooks
Suitable textbooks and general reading will be advised during the lectures.

SK527  Computing Techniques
Three hours per week
Practical programming work
Assessment is by progressive tests and assignments
An optional subject in the graduate diploma course in industrial management which consists of a selection from: algorithms and algorithmic processes, advanced BASIC and FORTRAN programming; an introduction to COBOL programming, special purpose languages, numerical control of machine tools, process control and simulation: the use of linear programming, PERT, Monte Carlo, dynamic programming and other techniques in the resolution of engineering design problems.

Textbooks
Suitable textbooks and general reading will be advised during the lectures.

SK891  Computer Appreciation
Three hours per week for one semester
A subject in the graduate diploma course in transportation systems.
Brief introduction to computing, covering basic features of hardware, program languages and job control languages. Planning software: consider the range and use of existing software for statistical, mathematical and planning applications. Applications: demonstrate the use of one or more planning tools, with emphasis on compatibility in detail between data, analysis method and application of output.
SM113  Engineering Mathematics
Four hours per week for two semesters
A first-year subject in the associate diploma course in production engineering in which emphasis is placed on consolidation of basic mathematical skills, and understanding of concepts in the areas of algebra, trigonometry and calculus.

SM194  Mathematics
Three hours per week for two semesters
A first-year subject in all degree courses in engineering which covers the basic mathematical knowledge considered to be minimally essential for an adequate understanding of the concurrent first-year studies in engineering.
The subject presents some additional material relevant to later engineering studies which will enable those students with ability and interest to develop further their mathematical knowledge and skills.
Functions, differentiation, integration methods, applications of differentiation and integration, infinite series, complex numbers, hyperbolic functions, differential equations, analytical geometry, functions of more than one variable, linear algebra.
References
Shenk, A. Calculus and Analytic Geometry. California, Goodyear, 2nd edn, 1979

SM292  Mathematics
Four hours per week of integrated instruction and practice for two semesters
A second year subject in the degree course in civil engineering.

SM294  Mathematics
Four hours per week of integrated instruction and practice for two semesters
A second year subject in the degree course in electrical engineering.

SM296  Mathematics
Four hours per week of integrated instruction and practice for two semesters
A second year subject in the degree course in manufacturing engineering.
Reference

SM298  Mathematics
Three hours per week of integrated instruction and practice for two semesters
A second year subject in the degree course in mechanical engineering.

SM305  Mathematics
Three hours per week for one semester
A third year subject in the degree course in manufacturing engineering.
Probability theory. Distribution theory and applications in univariate and bivariate cases. Correlation and regression. Introduction to linear programming.

SM317  Engineering Mathematics
Four hours per week for one semester.
Assessment is by assignment and examination.
A third-year subject in the degree course in electrical engineering (1976 Syllabus).
Fourier series and transforms, ordinary differential equations, special functions, partial differential equations, vector analysis, curvilinear co-ordinates, probability distribution theory.
Reference

SM392  Mathematics
Three hours per week of integrated instruction and practice for one semester
A third year subject in the degree course in civil engineering.
Optimisation, interpolation and approximation. Ordinary differential equations; finite difference methods for initial and boundary value problems. Introduction to finite element methods. Linear programming.

SM394  Engineering Mathematics
Three hours per week of integrated instruction and practice for one semester
A third year subject in the degree course in electrical engineering (1980 Syllabus).
SM398 Mathematics
Three hours per week of integrated instruction and practice for one semester.

A third year subject in the degree course in mechanical engineering (1980 syllabus).


SM402 Mathematical Methods
Forty-five hours for one semester
Prerequisites, SM209 and SM305

Assessment is continuous and/or by examination

A fourth-year subject in the degree course in manufacturing engineering.

Topics will include selections from: linear programming, integer programming, quadratic programming, dynamic programming, calculus of variations and other optimisation techniques; introduction to queuing theory; revision and extension of Laplace transforms.

Textbook

References

SM498 Mathematics
Three hours per week of integrated instruction and practice for one semester.

A fourth year subject in the degree course in mechanical engineering (1980 syllabus).


SM598 Mathematics
Three hours per week of integrated instruction and practice for one semester.

A fifth year subject in the degree course in mechanical engineering (1980 syllabus).


SM601 Statistical Techniques
Three hours per week for one semester

A subject in the graduate diploma course in transport systems transportation.

Statistical estimation: revision of basic distributions, tests of hypotheses (parametric and non-parametric), confidence intervals, goodness of fit tests.

Regression analysis: revision of matrix analysis, linear and multiple regression.

Design and analysis of experiments: one-way analysis of variance, two-way analysis of variance with interactions. Survey techniques: sampling plans, questionnaire design, measurement and analysis.

References

SM623 Engineering Mathematics
Three hours per week for two semesters

A subject in the graduate diploma course in engineering.

Matrix algebra: large linear systems.


SM492 Mathematics
Three hours per week for one semester

A subject in the fourth year of the degree course in civil engineering.

Matrix algebra: large linear systems.


References

SM494 Engineering Mathematics
Three hours per week of integrated instruction and practice for one semester.

A fourth year subject in both streams of the degree course in electrical engineering.

Functions of a complex variable, conformal mapping, inversion of Laplace transforms. Statistical decision theory.

References

Hildebrand, F.B. Advanced Calculus for Applications.


Hildebrand, F.B. Advanced Calculus for Applications.
Weinstock, R. Calculus of Variations. N.Y., McGraw-Hill, 1952

SP194  Physics
Three hours per week for two semesters
Assessment by semester examinations for theory, and continuous assessment for practical work
A first-year subject in all degree courses in engineering.
Linear and rotational mechanics; waves in elastic media; thermodynamics; electricity and magnetism; gravitation; fluid mechanics; geometrical and physical optics; kinetic theory of gases; atomic physics; structure and properties of solids.
The practical course is comprised of fourteen experiments on dynamics, wave motion, electricity and magnetism, thermal radiation, properties of matter, physical optics, atomic physics.
References

SP294  Engineering Physics
Two hours per week for two semesters.
Assessment by examination.
A second year subject in the degree course in electrical engineering.
Quantum physics and quantum optics. Wave-particle dualism; Schrodinger's equation and probability; uncertainty principle. Applications to tunnel effect; laser and maser action; laser communication, holography. Review of solid state physics of electronic devices and materials in current use and in development. Electronic statistics and noise. Electromagnetic waves: Maxwell's equations; propagation; application to communication systems; fibre optics; thin films; special relativity; Michelson-Morley experiments; application to communication and energy conversion. Nuclear physics: nuclear structure, properties, stability, decay and reactions. Instruments and accelerating machines used in nuclear physics. Thermo-nuclear energy from fission and fusion.

SP303  Engineering Physics
Two hours per week
Assessment is by examination
A third-year subject in the degree course in electrical engineering (1976 syllabus).
Quantum physics and quantum optics; wave-particle dualism; Schrodinger's equation and probability; uncertainty principle; applications to tunnel effect; laser and maser action; laser communication, holography.

SP404  Engineering Physics
Two hours per week
Assessment is by examination
A fourth-year subject in the degree course in electrical engineering.
Electromagnetic waves: Maxwell's equations; propagation; application to communication systems; fibre optics; thin films; special relativity; Michelson-Morley experiments; application to communication and energy conversion. Nuclear physics: nuclear structure, properties, stability, decay and reactions. Instruments and accelerating machines used in nuclear physics. Thermo-nuclear energy from fission and fusion. Nuclear reactors.

Textbook
There is no prescribed text
**Building Surveying subject details**

The following subjects form part of the proposed course in Building Surveying.

Subjects in this section are grouped in numerical order within these codes:

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<tr>
<th>Code</th>
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<tr>
<td>BS</td>
<td>Business Faculty</td>
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<tr>
<td>CE</td>
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<td>ME</td>
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<td>MP</td>
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<td>TB</td>
<td>Building Division (Swinburne Technical College)</td>
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**AT195 Communications 1**

Two hours per week for two semesters

A first year subject in the diploma of building surveying, which introduces students to techniques for improving confidence in oral and written communication. The main emphasis will be on oral communications in the following areas:

- Relating to the public: use of telephones, clear explanations and descriptions, public speaking.
- Work relations: use of recording devices, job interview, presentation of reports, business letters, files.
- Peer group relations: arguing points of view, conduct of meetings.

Language and social context, committee reports.

**AT397 Behavioural Studies**

Four hours per week for one semester

A third year subject in the diploma of building surveying, which introduces students to aspects of intra- and inter-personal processes and to provide practical behavioural skills in social interaction.

This subject has been designed to be integrated with administration subjects.

**AT494 Communications 2**

Two hours per week for one semester

A fourth year subject in the diploma of building surveying, which develops skills further in specific areas of communication relevant to building surveyors.

Oral and written work in the following areas:

- Relating to the public.
- Work relations: technical and descriptive reports and their interpretation, work diaries, reports to councils, job applications.
- Peer group relations: working with committees, minutes of meetings, conduct of meetings.

**BS196 Introductory Law**

Two hours per week for one semester

A first year subject in the diploma of building surveying, intended to enable students to understand the origins and operations and the use of law in their personal, civic and business affairs.


**BS399 Administration 1**

Three hours per week for one semester

A third year subject in the diploma of building surveying, intended to introduce students to organisation and management theory and to develop their understanding of management problems in organisations and ways of dealing with them.

Management and its environments.

Current management thought and its origin: scientific management, traditional organisational principles.

Bureaucracy, human relations management, systems theory. Contingency theory and problems of management: planning strategy, organisational design, mechanistic and organic systems of management.

**BS400 Administration 2**

Four hours per week for one semester

A fourth year subject in the diploma of building surveying, intended to develop students’ understanding further, of administration and management principles.

Decision-making and planning.

Organisational communication.

Control systems.

Organisational behaviour: motivation, behaviour modification, group dynamics, management style, organisational climate, managing planned change.

Staffing and man-power planning. The effective and efficient organisation.

**CE112 Applied Mechanics**

Four hours per week for two semesters.

A first year subject in the diploma of building surveying, designed to develop in students an understanding of the basic principles of mechanics and their application to the behaviour of loaded members and simple systems.

Basic concepts: loads, reactions, equilibrium, internal forces, determinacy, superposition.

Stress and strain: general load-deflection and stress-strain behaviour including elastic, plastic, strain hardening, brittle, non-linear and viscous behaviour. Linear elastic parameters.

Properties of materials: relevant mechanical properties (density, stress-strain behaviour, effects of temperature) of common building materials including metals, timber, rock, concrete, ceramics and plastics. Common tests to measure properties.

Behaviour of structural members: statically determinate tension members, beams, long and short columns, shafts, simple connections.
CE242  Land Surveying
Four hours per week for one semester.
A third year subject in the diploma of building surveying, designed to enable students to understand basic surveying techniques and legal aspects of surveys as related to building surveying practice.
Principles and techniques of surveying and law related to surveying: identification and location of land from titles, check surveys, Title amendments, Old law, Transfer & Land Act 1958, Cluster Titles Act 1974, Strata Titles Act 1967, encumbrances, easements, adverse possession, hiatuses, air rights.

CE252  Structural Design 1
Six hours per week for one semester
A second year subject in the diploma of building surveying, which develops in students an appreciation of the action of structural components and of complete structures and to introduce students to the methods of analysis available to designers.
Behaviour of structures: a descriptive treatment of the modes of structural action of the major types of structures, emphasising the relationship between deflections and internal forces and stresses for tension and compression structures, trusses, beams and frames, space structures and combined forms.
Introduction to structural analysis: descriptions of important methods of calculating deflections, analysing redundant structures and connections.

CE282  Geomechanics 1
Four hours per week for one semester
A second year subject in the diploma of building surveying, which provides a building surveyor with the necessary knowledge of geomechanics to enable him to perform his duties properly of inspection and approval of foundations and other earth works.
Types of soil and rock.
Soil water: permeability, effect of moisture content on strength.
Foundations: introduction to bearing capacity, settlement and foundation design. Approval of foundations.

CE352  Structural Design 2
Six hours per week for one semester
A third year subject in the diploma of building surveying, intended to familiarise the student with the processes of design and checking of structural computations, with particular emphasis on codes of practice for metal structures.
Structural design: the design process, design methods, stability of structures, checking of structural designs. Codes of practice for metal structures: steel structures code, high strength structural bolting code, cold formed steel structures code, aluminium structures code, other codes.

CE422  Urban Planning
Four hours per week for one semester
A fourth year subject in the diploma of building surveying, which introduces students to problems involved in planning development in urban and rural environments.
The planning process.
Administration of planning schemes.
Planning appeals: preparations for an appeal and participation in the appeals system.
Residential planning standards.
Planning law: Acts and legislation governing town planning. Use of remote sensing in urban planning.

CE452  Structural Design 3
Four hours per week for one semester
A fourth year subject in the diploma of building surveying, intended to extend students’ knowledge of structural and associated structures.
Special types of structures: principles of structural action, methods of construction for shells, folded plate structures, tension structures, high-rise post-tensioned structures, etc. Pre-cast and pre-fabricated structures.
Demolition: regulations, methods, equipment, shoring, design for demolition, problems with prestressed buildings.
Excavation practice: methods, equipment, rock excavation, trenching.
Cranes and lifting appliances.
Hydrology, surface and subsurface drainage: elements of hydrology, applications to roof and site drainage. Groundwater.
Practical work: drawings and sketches of relevant structural details, site visits, collection of technical information.

CE472  Building Structures 4
Four hours per week for one semester
A fourth year subject in the diploma of building surveying, intended to extend students’ knowledge of building and associated processes.
Special types of structures: principles of structural action, methods of construction for shells, folded plate structures, tension structures, high-rise post-tensioned structures, etc. Pre-cast and pre-fabricated structures.
Demolition: regulations, methods, equipment, shoring, design for demolition, problems with prestressed buildings.
Excavation practice: methods, equipment, rock excavation, trenching.
Cranes and lifting appliances.
Hydrology, surface and subsurface drainage: elements of hydrology, applications to roof and site drainage. Groundwater.
Practical work: drawings and sketches of relevant structural details, site visits, collection of technical information.

CE482  Geomechanics 2
Three hours per week for one semester
A fourth year subject in the diploma of building surveying, which extends students’ knowledge further, in the area of geomechanics.
CE492  Building Law and Contracts
Three hours per week for one semester
A fourth year subject in the diploma of building surveying, which provides building surveyors with a suitable legal background for the proper discharge of their duties.

ME169  Building Services 1
Three hours per week for first semester and four hours per week for second semester.
A first year subject in the diploma of building surveying, designed to provide students with an understanding of the basic principles and practice of various specialist services relevant to buildings.

ME369  Building Services 2
Two hours per week for one semester.
A third year subject in the diploma of building surveying, intended to extend students’ understanding further, of the services relevant to building.
Air-conditioning: basic principles of human comfort requirements and of equipment used to achieve these. Thermal, equipment and human loads. Insulation. Solar heating, passive and active. Speciality services: reticulated compressed air, vacuum lines, stand-by generating sets. Provisions for controls, adjustments, inspections and maintenance.

MP182  Building Materials
Two hours per week for first semester and three hours per week for second semester.
A first year subject in the diploma of building surveying, intended to give students an understanding of the behaviour of building materials so that they can determine whether traditional materials are being used correctly and appraise new materials.

TB701  Building Structures 1
Four hours per week for two semesters.
A subject in the first year of the diploma of building surveying designed to develop in students an understanding of the general principles of construction of single and double storey residential buildings and to develop their written and graphic communication skills and problem-solving abilities in this area.
Basic structural systems, regulations and codes, introduction to building trades, introduction to properties of materials used in domestic building, timber, plain and reinforced concrete, masonry. Methods of fixing: mechanical fasteners, adhesives, timber joints. Domestic construction: foundations, footing, floors, walls, claddings and linings, roof plumbing, joinery, fireplaces and chimneys, services, tiling, glazing, painting and decorating, builders’ hardware. Drawing practice: sketches and finished drawings for a variety of domestic construction components and structures.

TB702  Building Practice
Three hours per week for two semesters.
A subject in the first year of the diploma of building surveying, designed to provide students with practical experience in the various trades and practices used in the construction industry.
Practical work in: Carpentry and joinery, welding, plumbing, brickwork and masonry, electrical trades, fabrication and construction techniques in timber, concrete and steel.

TB703  Scaffolding
Two hours per week for two semesters.
A subject in the first year of the diploma of building surveying, designed to give students an understanding of the *Scaffolding Act* 1971 and statutory rules and regulations and the Regulations pertaining to scaffolding and the use of scaffolding.
TB704  **Practical Inspection**  
Three hours per week for one semester.  
A subject in the third year of the diploma of building surveying, designed to develop in students an understanding of the aims of site inspection and a knowledge of inspection methods.  
Aims and objectives of site inspection. The organisation of the building site and areas of responsibility of various inspection authorities. Methods of inspection of foundations and structures. Prevention of unsound practices and the processes of acceptance and rejection. Inspection of remedial work. Students will visit sites and submit inspection reports.

TB710  **Statutory Control 1**  
Two hours per week for two semesters.  
A first year subject in the diploma of building surveying, which provides the student with an understanding of the administrative procedures and principles which apply to a building surveyor's duties.  
Administration and law: Local Government structure and operation, the role and functions of the building surveyor, powers of entry, appeals, prosecutions, various standards and regulations. Regulatory control and inspectorial procedure for a range of building types.

TB721  **Building Structures 2**  
Six hours per week for one semester.  
A second year subject in the diploma of building surveying, designed to give students an understanding of the general principles and details of buildings with load-bearing walls up to three storeys and single-storey, wide span structures with framed or load-bearing walls.  
Structural systems, basis of design, structural materials used for buildings up to three storeys. Foundations, footings. Fire protection.  
Framed buildings: materials, columns, trusses, portal frames, space frames.  
**Formwork** for concrete. Stairs. Finishes.  
Drawing office work: drawings of details and structures relevant to the above topics.

TB722  **Building Practice 2**  
Six hours per week for one semester.  
A second year subject in the diploma of building surveying, designed to extend students' knowledge and experience of the various trades and practices used in the building industry.  
Further lectures and practice in carpentry, joinery, welding, plumbing, brickwork, masonry, plastering, tiling, electrical trades, fabrication and construction techniques.

TB712  **Statutory Control 2**  
Four hours per week for one semester.  
A second year subject in the diploma of building surveying, designed to impart to students an appreciation of those administrative procedures and principles which particularly apply to the office of building surveyor. Relevant acts, regulations and codes and related documentation will be emphasised.

TB741  **Building Structures 3**  
Six hours per week for one semester.  
A third year subject in the diploma of building surveying, intended to give students an appreciation of the general principles, structural details, and associated services for multi-storey framed buildings.  
Drawing practice: finished drawings and sketches of a variety of structures and details from the above topics.

At the time of going to press the course structure for the Diploma of Building Surveying was correct as at 31st August, 1980, but subject to approval and change. The course has since been modified and restructured as a three and a half-year program, with one semester in industry. Details of the revised course are available on request from:  
Mr A.J. Miles  
Engineering Faculty Secretary  819 8281  
or  
Mr. R.B. Sandie  
Head, Department of Civil Engineering  819 8275
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Courses offered
Swinburne Technical College is a College of Technical and Further Education which offers middle-level and technician certificate courses, apprentice courses, tertiary orientation program and various bridging, compensatory and special purpose courses. Certificate of Technology and Technician courses have been established in a number of areas and their scope is being extended. In most cases, tradesmen may enter these courses provided educational requirements are satisfied. Entry may be from year eleven and twelve levels, but applications from mature-age people are given special consideration. The Tertiary Orientation Program and Certificate of Business Studies courses may be taken on a full-time or part-time basis.

An entrant to a trade should seriously consider commencing a technician course in conjunction with apprenticeship training, as the completion of a technician course provides increasing possibilities for advancement.

Special short courses can also be arranged at the request of industrial and community groups.

Building
Building Construction
Apprenticeships
Carpentry
Joinery
Carpentry and Joinery
Technician Certificate—Building
Building Foreman
Building Inspector
Clerk of Works
Certificate of Technology—Building
Building Surveyor
Estimating
Building Supervisor
Design Drafting (Structural)
Special courses
Scaffolding Construction 1 & 2
Scaffolding Inspection
Crane Drivers, Dogmen and Crane Chasers
General Riggers 1 & 2
Riggers 3 & 4

Plumbing and Mechanical Services
Apprenticeships
Plumbing — Sanitary, General and Gasfitting
Plumbing — Mechanical Services, General and Gasfitting
Technician — Plumbing
Heating, Ventilating and Air-conditioning
Gasfitting
Plant Services Detail Drafting
Sanitary

Business Studies
Certificates
Accounting
Book-keeper/Typist
Office Administration
Personnel
Production
Sales and Marketing
Secretarial
Supply
Work Study

Engineering
Electrical and Electronics
Apprenticeship
Electrical Mechanics
Technician
Electronics
Electrical (Drafting)
Electrical (Power)
Electrical (Motor Control)
Certificate of Technology
Electrical
Electrical (Design Drafting)
Electronics
Certificate
Industrial Electronics
Post-trade
Electrical Contracting, Estimating and Supervision

Machines and Materials
Apprenticeships
Boilermaking and Structural Steel Fabrication
Fitting and Machining
Technician
Mechanical (Air-conditioning and Refrigeration)
Mechanical (Fluid Power)
Mechanical (Thermal Plant)
Mechanical (Drafting)
Production (Jig and Tool)
Production (Heat Treatment)
Production (Engineering Inspection and Metrology)
Production (Method Study)
Certificate of Technology
Mechanical
Mechanical (Design Drafting)
Production (Tooling Design)
Production (Work Study)
Higher Technician
Production (Quality Control)
Post-trade
Toolmaking
Welding (Electric or Oxy-acetylene)
Fitting and Machining
General Studies
Certificate
Applied Science (Science Laboratory)
Tertiary Orientation Program
Science
Engineering
Business
Arts
General
Humanities

Bridging Courses
Short-term bridging courses for tertiary, technician and Tertiary Orientation Program courses are also available.
Application procedure

Entrance requirements

Apprenticeship courses
To be eligible to enter an apprenticeship in any of the trades for which a course is offered at Swinburne, a candidate should be at least 15 years old and should have completed year nine in a technical school with passes in the appropriate subjects; passed a course equivalent to form three at a technical school, or have been accepted by the Industrial Training Commission as being educated to a standard sufficient to enable procedure with the subjects comprising the first year of the relevant course.

To enable candidates who have left school before reaching the standard of education required to commence an apprenticeship, some eastern suburbs regional colleges and schools provide a qualifying course. This course entails instruction in mathematics, drawing, science and English.

Having selected a trade, a candidate should:
(1) Apply to the Industrial Training Commission, 150 Queen Street, Melbourne, 3000, for a certificate of qualification to enter into an apprenticeship.
(2) Obtain work with an appropriate employer.
(3) Serve a probationary period at the trade, then sign an indenture of apprenticeship.

After entering into the indenture the Industrial Training Commission will advise the apprentice and the college of the course of study to be undertaken.

Certificate courses
Business Studies
Standard entrance requirement is Leaving, but mature-age students may also be admitted.

Industrial Electronics
Satisfactory completion of two years of an electrical technician course or four years of an electrical trade course, or an acceptable standard in any other approved course of study.

Applied Science
Entrance requirements are the successful completion of relevant year eleven subjects, but applicants with work experience may be admitted with less than year eleven level qualifications.

Technician courses
The usual academic requirements for entry to a technician course are passes at year ten level in

- English
- Mathematics
- Science

Applications for entry to a technician course should be made directly to the head of the department which offers the particular course.

Certificate of Technology courses
The usual academic requirements for entry to Certificate of Technology courses are passes in Technical Leaving English, General Mathematics (Technician), Technical Science ‘A’, Technical Drawing ‘A’ and an approved course in workshop practice. Metallurgy ‘IT’ is also a prerequisite for entry into the Certificate of Technology (Mechanical).

For entry into Certificate of Technology (Building) courses, satisfactory completion of the building trades technician certificate or experience and maturity, including five years in the building industry, as approved by the head of department.

Application for entry to a Certificate of Technology course should be made directly to the head of the department which offers the particular course.

Post-apprenticeship and special courses
Each of these courses has different entrance requirements according to the nature of the work experience already achieved or the prerequisites for a work ticket to satisfy government regulations.

Tertiary Orientation Program
Students wishing to enter the applied science and engineering stream should have passed an applied science course at year eleven level. For entry to other streams, students should have satisfactorily completed their year eleven studies.

Students from Eastern Metropolitan (Knox) region technical schools should apply through their respective schools. Application forms will be available from the Principal of each school in November 1980. The college cannot guarantee places for Knox Region Technical School students whose applications are received after 8 December 1980.

All other applicants should obtain forms from the college. The closing date is 2 February 1981 although applications received prior to 8 December 1980 will be given preference.

Enrolment regulations
All students will be required to pay a Student Union and Sports Association fee at the time of enrolment. Enrolment is not completed until the fee is paid. Students whose fees are to be paid by an employer or who are under the NEAT scheme etc. must bring written authority at time of enrolment.

Fees
At the time of going to press the Student Union and Sports Association fees for 1981 had not been determined. In 1980 the fees were:

<table>
<thead>
<tr>
<th>Course</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary Orientation Program</td>
<td>$45.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>Full-time</td>
<td>$45.00</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>$13.50</td>
<td></td>
</tr>
</tbody>
</table>

Refund of fees
Applications for fee refunds must be made by 31 March. The full fee will be refunded if the student has not attended classes. In all other cases a service fee of $5.00 will be charged.
Office hours
The Swinburne Technical College Main office is open from
8.45am-8.00pm Monday to Thursday
8.45am-5.06 Friday.

Amendment to enrolment details
If any of the subjects, after the initial enrolment, have been dropped, or any new subjects added, the student must complete a change of enrolment form which is available from the student’s department, and lodge it at the Main office (66 Park Street) within 7 days.
Students wishing to record some other enrolment change, e.g. address, employer, should consult the Main office. Students who at any time believe that college records may not show their current address should notify the Main office (66 Park Street).
Students who fail to notify the Main office of withdrawal of a subject or cancellation of enrolment:
(a) by the end of term 1 for subjects with a mid-year final examination, and
(b) by the end of term 2 for subjects with an end of year final examination,
will have the result ‘withdrawal prior to completion of subject’ recorded for the subjects affected.

Exemptions
Students seeking exemptions from subjects should complete an application for exemption form obtainable at Main office or from the division controlling the subject. It is the student’s responsibility to obtain such approval to ensure that the completed form is returned to Main office only. Students will receive written confirmation of approved exemptions.

Semester examinations 1981
Examination time-tables
Approximately half-way through each semester, a provisional examination time-table will be displayed on notice boards around the college. Students should note their examination times and immediately report any clashes to the examinations officer. The final time-table, without room allocations, will be posted approximately one month later. Room allocations will be posted at least one week before classes end.
It is the responsibility of students to ascertain dates and times of examinations. No information will be given by telephone.

Conduct of examinations
(1) Unless otherwise stated on the time-tables, morning examinations will commence at 8.50am and afternoon examinations will commence at 1.20pm.
(2) Students must take their identity cards into the examination room.
(3) Students are required to provide their own slide rules and drawing instruments.
(4) Students will not be permitted to enter the room after half an hour has elapsed from the commencement of examination, and will not be permitted to leave until half an hour after commencement of examination.
(5) Four-figure mathematical tables and other information will be supplied where necessary.
(6) Unless expressly prohibited, electronic calculators may be used. These must be battery-operated. Students will not be permitted to borrow or lend calculators during an examination.

Absence from examinations
Students who are absent from an examination due to illness or other reason and who wish to apply for a special examination must apply through the Main office. Such an application must be accompanied by evidence (e.g. medical certificate) that there was a genuine inability to attend the examination. The application must be lodged at the Main office (66 Park Street) within 48 hours of the examination.
Students who are absent from an examination through misreading the time-table are not automatically entitled to a special examination. Students in this position should contact the head of their awarding department.

Publication of results
First semester results will be displayed at 66 Park St., but end of year results for Swinburne Technical College students will be displayed on the notice board in the Ethel Swinburne Hall approximately two weeks after the particular examination has been held. To ascertain from Main office if the results of a particular subject have been released, subject codes must be quoted. Internally assessed examination results will not be given over the telephone. Education Department (externally assessed) results may be obtained by telephoning 651 2968 (Examinations Branch).
The following marking scheme will be used by the Technical College:
Credit 75 — 100% C
Pass 50 — 74% P
Supplementary (Externally assessed) 35 — 49% S
Not completed NC
Withdrawn W

Education Department examinations
A re-mark of an external paper may be obtained on the payment of a fee of $9.50. Application should be made and the fee paid to: The Cashier, Education Department, Nauru House, 80 Collins Street, Melbourne 3000 (Examinations Branch). Student name, identity number and subject details must be quoted. Applications for a re-mark must be made within 30 days of the date upon which the relevant examination results are published.
Awards

Students anticipating completion of course at the end of 1981

Students who anticipate completion of the academic work for their courses at the end of 1981 and wish for a consolidated statement of results — indicating subjects passed and those still required to complete their course, are advised to apply now.

This statement, in conjunction with the computer-printed certificate of official results, should be sufficient for employers etc. to confirm that the course is complete or otherwise.

Students nearing completion of their course

Students nearing completion of their course may obtain a statement indicating those subjects passed and those subjects still required to complete their courses.

Conferring of certificates

Students eligible to receive certificates are required to make application on the form prescribed, available from the Main office (66 Park Street). Applications close on 28 November each year and for applicants who anticipate completing the academic work in the following December exams, the conferring ceremony will be held the following year.

Student allowances

Full-time students only

Certificate Courses

Students taking full-time certificate courses are eligible to apply for government assistance under the Tertiary Education Assistance Scheme (TEAS). Assistance is available subject to a means test.

Tertiary Orientation Program

Students over the age of nineteen years on 1 January 1981 may be eligible for assistance under the Adult Secondary Education Assistance Scheme (ASEAS). Other government assistance schemes are available to assist special categories of students. These are:

(a) secondary allowance scheme for students from lower income families.
(b) assistance for isolated students, that is, students who do not have reasonable daily access to an appropriate government school.

Education allowance

An education allowance of $70.00 for the purchase of text-books and materials will be paid to every full-time Tertiary Orientation Program student.

Payment will be made in two instalments of $35.00 each. The first instalment will be paid as soon as attendance at classes has been confirmed. The second instalment will be paid after the 1st July.

Applications should be completed and returned to the General Office at 66 Park Street at the time of enrolment or as soon as possible thereafter.

Enquiries about student allowances should be made to the Student Health and Welfare Unit, Level 2, BA building.

Conveyance allowance and fare concessions

Full-time students under 21 years of age, whose place of residence is situated outside a radius of 4.8 kilometres from the college, may make application for a conveyance allowance provided there is no other technical college nearer their home than Swinburne which provides a course of study comparable with that required by the student. Distances are calculated on a radial basis on a map supplied by the Education Department, a copy of which can be viewed at the Accounts office at 66 Park St.

Students not attending the college nearest to their residence may receive an allowance if:

(a) they applied for and were refused admittance to the college or colleges nearer to their homes, and they can produce documentary evidence to this effect;
(b) they can maintain that it is cheaper and easier to travel to Swinburne.

Students who think they may be eligible for a conveyance allowance should enquire at the college Accounts office before 1 March 1981. All application forms must be returned to the Main office before 31 March 1981.

Applicants should take advantage of concessions in fares since full-time students travelling by rail or tram will be paid only the cost of special concession tickets. Wherever practicable, students must avail themselves of rail transport.

Students travelling by more than one means of conveyance (rail and bus, tram and bus, etc.) may receive an allowance only for that transport involving the greater fare unless the distance travelled by each form of transport is at least 4.8 kilometres.

Except in special cases approved by the Minister of Education, a conveyance allowance in excess of $231 per annum will not be paid on behalf of any student. Eligible students who use as their means of transport, bicycles, private motor cars or motor cycles are entitled to allowances at the rate of $50 per annum.

Student health and welfare services

The following services are available to all students:

- Counselling
- Health
- Employment
- Housing
- Careers Library
- Chaplaincy

Students are encouraged to use these services. More details will be found in the General Information section of this handbook or by contacting Student Counselling on level 2 of the BA building, telephone: 819 8025.
# Building Division

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- Building courses ............................ TC10
- Plumbing and gasfitting courses ........... TC16
- Registration courses ....................... TC14
- Subject details .............................. TC19
Building Division
Head
G.A. Martin, BA, MMS, MIIE, AAIB

Building Construction Department
Head
T.C. Bell, TTrIC, TechCert, BldgInspCert

Academic staff
A. Boltman, GradIEAust, DipEd
A.R. Cottle, DipBldg, DipEd, BldgSurvCert, FAIBS
R.L. D’Argaville, TTrIC
S. Day, TTrIC
D.R. Dendle, TTrIC
M.J. Finnerty, TTrIC, DipTT, CofWCert, MBPDS
A. Harris
D.G. Hendry, DipBuild, BuildSurvCert
H. Lovig
J. Miller
V.N. Osterlund, TTrIC, TechCert
A.L. Patience, DipBldg, BEd, TTrIC, TechCert, BuildSurvCert, MAICS, MAIB, MIAA
Z.P. Szirrom, DipBldg, TTTC
E. Trotter, CertBldg, TTrIC
R.P. Ulbrick, TTrIC
C.W. Watson, ACTT
B. Williamson

Plumbing and Mechanical Services Department
Head
E.C. Bird, TTrIC, MIPA

Academic staff
J. Coghlan, TTrIC, TechCert, MIPA
M. Dempsey
J.F.T. Gooding, DepTT, TechCert
G.A. Grendon, TTrIC
L.A. Griffin, TTrIC
I. Heatley, TTrIC, MIPA
R.C. Hill, TechCert, AssAIRAH
I. Holmes, TTrIC
M.A. Kefford, DipTT
C. J. Kinrade, TTrIC
B. J. Morrison, TTrIC
N.J. McBrade, TTrIC
G. Oldham, TTrIC, CertSewInstandDes, MIPA
J.B. Tobin, TTrIC, TechCert
L.J. Walker, DipTT, CofTTech, TechCert, AssAIRAH
G.J. Williams, DipTT

Building courses

Building construction

The following courses are offered by the Building Construction Department.

Apprenticeships — Carpentry, Joinery or Carpenter and Joinery
The department is responsible for the carpentry and joinery course, which is an apprenticeship course of three years' duration designed to meet the requirements prescribed in the Apprenticeship Carpentry, Joinery trades regulations of the Industrial Training Commission.

Technician Certificate—Building courses
The building technician certificate is accepted as evidence that certificate holders have received training which should enable them to accept positions of responsibility in the industry. It is possible to complete the course by evening and/or part-time day attendance at the college. Apprentices may take a technician course concurrently with normal apprenticeship training, but attendance at evening classes is necessary.

The following courses are available:

81112E Building Foreman
81113E Building Inspector
81111E Clerk of Works

The Building Inspectors’ Certificate course meets the requirements of the Municipal Building Surveyors’ Board (Building Inspectors) Regulations, issued under the authority of the Local Government Act 1958, Victoria. The Clerk of Works Technician Certificate course meets the requirements of the Clerk of Works Institute of Australia.

Certificate of Technology — Building courses
To train, for a variety of special areas of responsibility in the building industry; immediate support personnel to management and the professions.

The following courses are available:

81133B Building Surveyor
81134B Estimating
81135B Building Supervisor
81150G Design Drafting (Structural)

The building surveyor's course meets the requirements of the Municipal Building Surveyors’ Board (Building Inspectors) Regulations, issued under authority of the Local Government Act 1958, Victoria.

Design Drafting Course
To be eligible to undertake the structural design drafting course, students must be employed in appropriate drafting work.

Registration courses
Scaffolding course:
Scaffolding subjects are conducted which meet the requirements of the scaffolding regulations.
起重机操作员、dogmen 和起重机追逐者课程以及学徒课程

这些课程符合劳工和行业部的要求。咨询：Mr T.C. Bell 819 8500。

学徒课程

81101D 学徒制，木工、家具制作或木工和安装

每周工作八小时，三年内完成至少二十四个模块。

学徒需要每周一天的课程，第二年和第三年学生可以参加选修的晚上课程。

TB051 模块 1：简单的基础结构，基本工具技能
TB052 模块 2：简单的木墙框架
TB053 模块 3：简单的木屋顶——skillion 和gable
TB054 模块 4：简单的门——ledged 和 braced —fly wire
TB055 模块 5：简单的窗户——casement frame 和 sash
TB056 模块 6：木头、篱笆和大门
TB057 模块 7：木屋建造——地面结构包括墙板设置
TB058 模块 8：木屋建造——墙框架
TB059 模块 9：木屋建造——天花板和gable屋顶框架
TB060 模块 10：木屋建造——简单的山墙

81112E 技术证书—建筑

课程详情

The course consists of eleven subjects. All subjects are offered on a part-time evening basis, however some subjects are also conducted during the day.
The Technician Certificate will be awarded to any student who completes the following:

All subjects in the Technician Certificate — Building (Building Foreman) plus completion of an approved apprenticeship course.

Subjects                              Hours week

TB216  Building Construction 1A      2
TB217  Building Construction 1B      2
TH145  Building English             2
TB322  Building Construction 2A      2
TB323  Building Construction 2B      2
TB226  Building Mathematics (T)      2
TB220  Building Science 1A and 1B    2
TB417  Building Surveying            4
TB222  Technical Reports (Building) 2
TB426  Building Administration and Supervision 2
TB440  Builders Quantities           2

81113E Technician Certificate — Building (Building Inspector) (1976 syllabus)

General description and aim of course
The course is designed
(a) to be a job-oriented extension to the basic vocational courses;
(b) to suit the particular needs and interests of students and employers;
(c) to meet the minimum entrance requirements of the Certificate of Technology — Building.

Entrance requirements
Completion of a year ten standard of education, and engaged in an appropriate vocational program.

Career potential
Substantial opportunities exist in municipal building inspection and similar positions may be available with the building department of various large organisations, e.g. banks, government departments and authorities.

Course structure
The course consists of 12 subjects. All subjects are offered on an evening part-time basis and all subjects are offered during the day.

Prospective students can also apply to complete the first year on a full-time basis.

Completion of course
The Technician Certificate — Building (Building Inspector) course meets the requirements of the Municipal Building Surveyors’ Board (Building Inspectors) Regulations, issued under the authority of the Local Government Act 1958, Victoria.

Students who have completed the Technician Certificate — Building (Building Inspector) are eligible to continue studies leading to a Certificate of Technology — Building (Building Surveyor) or other Certificate of Technology — Building course.

Course structure                              Hours week

TB216  Building Construction 1A      2
TB217  Building Construction 1B      2
TB222  Technical Reports (Building) 2
TB322  Building Construction 2A      2
TB323  Building Construction 2B      2
TB439  Scaffolding Inspection B      1
TB440  Building Mathematics (T)      2
TB126  Building Mathematics (T)      2

81111E Technician Certificate — Building (Clerk of Works)

It is necessary for entrants to the course to be serving, or have served, an apprenticeship (with proficiency) in one of the following approved building trades:

Carpentry
Joinery
Plumbing — Sanitary, General and Gasfitting
Plumbing — Mechanical Services, General and Gasfitting
Bricklaying

or
have at least ten years’ experience, approved by the head of the department.

Course structure                              Hours week

TB216  Building Construction 1A      2
TB217  Building Construction 1B      2
TB220  Building Science (T) A and B  2
TB222  Technical Reports (building)  2
TB322  Building Construction 2A      2
TB323  Building Construction 2B      2
TB417  Building Surveying (T) theory and maths 5
TB412  Building Construction 3A      2
TB413  Building Construction 3B      2
TB426  Building Administration and Supervision 2
TB419  Specifications, drawing, interpretation and co-ordination 2
TB436  Practical Inspection (building) 2
TB435  Scaffolding Inspection A      2
TB439  Scaffolding Inspection B      2
TB502  Quantity Surveying I         2
TB110  Contracts and Building Law   2
TB520  Role and Function of a Clerk of Works (half-year) 2

81120G Building Higher Technician course (part-time)

This course applies to completing students only and is not available to new students.
### Course structure

#### Stage 1
- **TB216** Building Construction 1A 2
- **TB217** Building Construction 1B 2
- **TB134** Social Science (half-year) 3
- **TB120** Advanced Building Graphics (half-year) 2
- **TM120** Mathematics 1H 2

#### Stage 2
- **TB216** Building Construction 2A 2
- **TB217** Building Construction 2B 2
- **TB241** Building Services 2
- **TM220** Mathematics 2H 2
- **TB242** Basic Quantities and Estimating (half-year) 2
- **TB243** Industrial Relations (half-year) 2

#### Stage 3
- **TB365** Building Science H (A and B) 3
- **TB412** Building Construction 3A 2
- **TB413** Building Construction 3B 2
- **TB366** Practical Structures 2

#### Stage 4
- **TB160** Site Organisation and Administration 2
- **TB470** Building Practice 2
- **TB437** Scaffolding Inspection A 2
- **TB438** Scaffolding Inspection B 2
- **TB480** Elements of Town Planning 2

#### Stage 5
- **TH115** Communication 2
- **Electives (two)** 4

#### Stage 6
- **Electives (four)** 8

### Certificate of Technology — Building courses

#### 8113B Certificate of Technology — Building Surveyor (1967 syllabus)

This course applies to completing students only and is not available to new students.

<table>
<thead>
<tr>
<th>Course structure</th>
<th>Hours week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
</tr>
<tr>
<td><strong>TB216</strong></td>
<td>Building Construction 1A 2</td>
</tr>
<tr>
<td><strong>TB217</strong></td>
<td>Building Construction 1B 2</td>
</tr>
<tr>
<td><strong>TB322</strong></td>
<td>Building Construction 2A 2</td>
</tr>
<tr>
<td><strong>TB323</strong></td>
<td>Building Construction 2B 2</td>
</tr>
<tr>
<td><strong>TB433</strong></td>
<td>Powers and Duties of a Municipal Building Surveyor Part I 2</td>
</tr>
<tr>
<td><strong>TB426</strong></td>
<td>Building Administration and Supervision 2</td>
</tr>
<tr>
<td><strong>TB429</strong></td>
<td>Building Practice 2</td>
</tr>
<tr>
<td><strong>TB435</strong></td>
<td>Scaffolding Inspection A 2</td>
</tr>
<tr>
<td><strong>TB439</strong></td>
<td>Scaffolding Inspection B 2</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
</tr>
<tr>
<td><strong>TH050</strong></td>
<td>English 3</td>
</tr>
<tr>
<td><strong>TB431</strong></td>
<td>English Report Writing, Library and Thesis 2</td>
</tr>
<tr>
<td><strong>TB435</strong></td>
<td>Applied Mechanics 1 2</td>
</tr>
<tr>
<td><strong>TB412</strong></td>
<td>Building Construction 3A 2</td>
</tr>
<tr>
<td><strong>TB413</strong></td>
<td>Building Construction 3B 2</td>
</tr>
<tr>
<td><strong>TB408</strong></td>
<td>Foundations 2</td>
</tr>
<tr>
<td><strong>TB430</strong></td>
<td>Building Science 1A and B (building surveyors) 2</td>
</tr>
<tr>
<td><strong>TB434</strong></td>
<td>Powers and Duties of a Municipal Building Surveyor, Part 2 2</td>
</tr>
<tr>
<td><strong>TB427</strong></td>
<td>Building Construction 2C (structural analysis) 2</td>
</tr>
<tr>
<td><strong>TB428</strong></td>
<td>Building Construction 3C (theory of structure) 2</td>
</tr>
</tbody>
</table>

#### 8113B Certificate of Technology — Building Estimating

The course consists of twenty-three subjects (30 units) all of which may be taken part-time.

The expected duration of the course is six years part-time, however, this may be shortened by taking advantage of those subjects offered during daytime hours.

<table>
<thead>
<tr>
<th>Course structure</th>
<th>Hours week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TB216</strong></td>
<td>Building Construction 1A</td>
</tr>
<tr>
<td><strong>TB217</strong></td>
<td>Building Construction 1B</td>
</tr>
<tr>
<td><strong>TB322</strong></td>
<td>Building Construction 2A</td>
</tr>
<tr>
<td><strong>TB323</strong></td>
<td>Building Construction 2B</td>
</tr>
<tr>
<td><strong>TB412</strong></td>
<td>Building Construction 3A</td>
</tr>
<tr>
<td><strong>TB413</strong></td>
<td>Building Construction 3B</td>
</tr>
<tr>
<td><strong>TH115</strong></td>
<td>Communication and Report Writing</td>
</tr>
<tr>
<td><strong>TB601</strong></td>
<td>Professional Practice of a Building Surveyor</td>
</tr>
<tr>
<td><strong>TB436</strong></td>
<td>Practical Inspection (building)</td>
</tr>
<tr>
<td><strong>TB425</strong></td>
<td>Applied Mechanics 1</td>
</tr>
<tr>
<td><strong>TB437</strong></td>
<td>Statutory Control of Building 2</td>
</tr>
<tr>
<td><strong>TB504</strong></td>
<td>Applied Geomechanics</td>
</tr>
<tr>
<td><strong>TB427</strong></td>
<td>Building Construction 2C (Structural Analysis)</td>
</tr>
<tr>
<td><strong>TB428</strong></td>
<td>Building Construction 3C (Theory of Structures)</td>
</tr>
<tr>
<td><strong>TB220</strong></td>
<td>Building Science 1A and 1B</td>
</tr>
<tr>
<td><strong>TS215</strong></td>
<td>Behavioural Studies 1A</td>
</tr>
<tr>
<td><strong>TS216</strong></td>
<td>Behavioural Studies 1B</td>
</tr>
<tr>
<td><strong>TB470</strong></td>
<td>Introduction to Building Law 1A and 1B</td>
</tr>
<tr>
<td><strong>TB435</strong></td>
<td>Scaffolding Inspection A</td>
</tr>
<tr>
<td><strong>TB439</strong></td>
<td>Scaffolding Inspection B</td>
</tr>
<tr>
<td><strong>TB502</strong></td>
<td>Quantity Surveying I</td>
</tr>
<tr>
<td><strong>TB242</strong></td>
<td>Basic Quantities and Estimating (one semester)</td>
</tr>
<tr>
<td><strong>TB280</strong></td>
<td>Specifications 1A and 1B</td>
</tr>
<tr>
<td><strong>TB120</strong></td>
<td>Advanced Building Graphics 2</td>
</tr>
<tr>
<td><strong>TB220</strong></td>
<td>Building Science 1A and 1B</td>
</tr>
<tr>
<td><strong>TB320</strong></td>
<td>Building Science 2A and 2B</td>
</tr>
<tr>
<td><strong>TM120</strong></td>
<td>Mathematics 1H</td>
</tr>
<tr>
<td><strong>TM220</strong></td>
<td>Mathematics 2H</td>
</tr>
<tr>
<td><strong>TH115</strong></td>
<td>Communication and Report Writing</td>
</tr>
<tr>
<td><strong>TB366</strong></td>
<td>Practical Structures and Practical Workshop</td>
</tr>
</tbody>
</table>

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**Swinburne Technical College**
### 81135B Certificate of Technology — Building (Building Supervisor)

<table>
<thead>
<tr>
<th>Course structure</th>
<th>Hours week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB316 Building Construction 1A</td>
<td></td>
</tr>
<tr>
<td>TB317 Building Construction 1B</td>
<td></td>
</tr>
<tr>
<td>TB322 Building Construction 2A</td>
<td></td>
</tr>
<tr>
<td>TB323 Building Construction 2B</td>
<td></td>
</tr>
<tr>
<td>TB342 Building Construction 3A</td>
<td></td>
</tr>
<tr>
<td>TB343 Building Construction 3B</td>
<td></td>
</tr>
<tr>
<td>TB344 Services in Building</td>
<td></td>
</tr>
<tr>
<td>TB366 Practical Structures and Practical Workshop</td>
<td></td>
</tr>
<tr>
<td>TB360 Site Organisation and Administration</td>
<td></td>
</tr>
<tr>
<td>TB242 Basic Quantities and Estimating (one semester)</td>
<td></td>
</tr>
<tr>
<td>TB280 Specifications 1A and 1B</td>
<td></td>
</tr>
<tr>
<td>TB280 Advanced Building Graphics</td>
<td></td>
</tr>
<tr>
<td>TB220 Building Science 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TB220 Building Science 2A and 2B</td>
<td></td>
</tr>
<tr>
<td>TM120 Mathematics III</td>
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<tr>
<td>TM220 Mathematics 2H</td>
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<tr>
<td>TH115 Communication and Report Writing</td>
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<tr>
<td>TB516 Building and Community Development</td>
<td></td>
</tr>
<tr>
<td>TS215 Behavioural Studies 1A</td>
<td></td>
</tr>
<tr>
<td>TS216 Behavioural Studies 1B</td>
<td></td>
</tr>
<tr>
<td>TB530 Network Scheduling for Critical Path Analysis</td>
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<tr>
<td>TB452 Industrial Relations 1A and 1B</td>
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<tr>
<td>TB501 Building Plant and Method</td>
<td></td>
</tr>
<tr>
<td>TB110 Contracts and Building Law</td>
<td></td>
</tr>
<tr>
<td>TB380 Specifications 2A and 2B</td>
<td></td>
</tr>
</tbody>
</table>

### 81150G Certificate of Technology — Design Drafting (Structural)

#### Career potential

This course is suitable for those seeking employment as structural design draftsmen in structural engineering situations. Similar opportunities may be available in architectural offices for structural design detailing.

#### Entrance requirements

Students must have passes at year eleven level in English, Technician Mathematics, Technician Science A, Technical Drawing, Workshop Practice, or approved equivalents.

Preference will be given to students employed in structural design drafting work.

#### Course structure

Completion of the course requires a total of 30 units consisting of 28 core units and 2 elective units.

The course is available on a part-time basis, however, depending on enrolment, the first year may be available on a full-time basis.

<table>
<thead>
<tr>
<th>Core subjects</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM220 Mathematics 2A and 2B</td>
<td></td>
</tr>
<tr>
<td>TM160 Physics 1A and 1B</td>
<td></td>
</tr>
<tr>
<td>TH115 Communication</td>
<td></td>
</tr>
</tbody>
</table>

### 81166B Basic Industrial Lift Truck Course

**TB930**

This course has been designed on the basis that all trainees will receive a minimum of 24 hours practical instruction and 8 hours theoretical instruction. In regard to practical training particular attention should be given to the following aspects of Industrial Lift Truck operation. It should be noted that a minimum of 24 hours practical instruction is based on the assumption that the trainee holds a licence to drive a motor vehicle. Trainees who do not hold such a licence will obviously require many more hours practical instruction.

### 81168 Riggers

**TB801**

The course enables a student to attain the standard which will allow the issue of a Class 1 and 2 Riggers Certificate. A Class 1 and 2 Rigger is an adult person engaged in rigging work erecting, dismantling or demolition of buildings, structures and machinery, also
rigging work on ships in dock or in industrial plants.
A rigger is normally employed under the supervision of construction engineers, superintendents, supervisors or foremen who have jurisdiction over skilled trades on new construction, reconstruction or major repair work, but is not required to have the benefit of this supervision.

TB803  Riggers 3
Instruction sufficient to enable the scaffoldcler to erect, alter or dismantle heavy-duty suspended scaffolding and heavy-duty suspended swing-stage scaffolding.

TB 804  Riggers 4
Instruction sufficient to enable the scaffoldcler to erect, alter or dismantle light-duty swing-stage scaffolding and boatswain’s chair.

81162B  Scaffolding Construction
TB901  Class 1
Instruction sufficient to enable the scaffoldcler to erect, alter or dismantle pole scaffolding, both tube, and timber and frame scaffolding.

TB902  Class 2
Instruction sufficient to enable the scaffoldcler to erect, alter or dismantle cantilever and bracket scaffolding.

81162B  Scaffolding Construction (one semester)  

TB901  Scaffolding Construction 3

[Time period is under review by the Board of Examiners (Scaffolding) and the Education Department]

81163B  Scaffolding Inspection
Scaffolding inspection meets the requirements of the building surveyor’s course, the building inspector’s course, and is suitable for those who are to be employed as scaffolding inspectors. The duration of the subject is one year, based on three hours per week.

TB435  Scaffolding Inspection A
TB439  Scaffolding Inspection B

81164B  Crane Drivers, Dogmen and Crane Chasers Course
This course is of half-year duration based on three hours per week. Students who are enrolled are eligible to apply for a learner’s permit from the Department of Labour and Industry which will allow a person to work in industry as a learner. In addition to passing this course, certain practical tests must be undertaken before a certificate of competency will be issued.

81165B  Riggers
TB801  Riggers 1  )  2 semesters
TB802  Riggers 2  )
TB803  Riggers 3  )  1 semester
TB804  Riggers 4  )

Enquiries
Enquiries about special courses should be directed to Mr T. Bell, 819 8500 or Mr C. Watson, 819 8822 or 819 8502.
Plumbing and Gasfitting courses

The following courses are offered by the Plumbing and Gasfitting Department.

Apprenticeship courses

Three separate apprenticeship courses are available to serve the classification of the apprenticeship being undertaken.

T23 Plumbing — Sanitary, General and Gasfitting (81201D)

T23A Plumbing — Mechanical Services, General and Gasfitting (81202D)

32CDA — Plumbing (Course code to come)

T23 and T23A are available as part-time Day release or Block release and comply with the Industrial Training Commission of Victoria requirements of being in modular form.

This type of training program was introduced in 1971 to provide flexibility of progression during the three years the student is attending.

Courses for both these apprenticeships are common for 20 of the 28 modules.

Students completing one of these apprenticeship courses may undertake and qualify in an alternative apprenticeship course by completing the eight specialist modules successfully.

Qualifying examinations are conducted twice yearly in June/July and November/December.

The third apprenticeship course 32CDA was introduced in 1980 as a pilot course under the Systems Approach to Learning Scheme.

This gives the students active participation with ‘On-site’ situations that they may encounter in plumbing installations, and meets the needs of the Industrial Training Commission of Victoria and the National Basic Trade Common Course in Plumbing and Gasfitting.

The students are required to attend part-time Block release for this course (32CDA).

The 32CDA course comprises 1040 hours of student learning over three stages. Stage 1 and 2 comprise 850 hours and make up the basic units. To complete the course, students in consultation with their employers and the College will select the final study area. Students may undertake any of the other alternative study areas in their own time.

Further details of this course are available from Mr E. C. Bird, Tel: 819 8518.

Entrance requirements

Satisfactory completion of year nine in a secondary school with passes in English, Mathematics, Science and Drawing.

Industrial Training Commission approval to enter the trade.

Technician courses

81201E Technician Certificate Plumbing (Heating, Ventilation and Air-conditioning)

81212E Technician — Plant Services Detail Drafting

The usual duration of the technician course is four years. With the exception of a two-hour class in the second year, the first two years of each course are common. Specialised subjects for each of the technician courses begin in the third year.

Apprentices who are taking a technician course concurrently with their daytime training and tradesmen undertaking the course as post-apprentice training will be required to attend evening classes. These are usually confined to two evenings per week.

Plant services detail drafting course

The usual duration of this course is three years. It is designed to train personnel in the preparation of detailed working drawings of heating, ventilating, air-conditioning and refrigerating systems and the essential services for private, commercial and industrial projects.

Enquiries

E. C. Bird, 819 8518.

81201D Plumbing — Sanitary, General and Gasfitting

81202D Plumbing — Mechanical Services, General and Gasfitting

Course structure T23

Sanitary, Mechanical Services, General and Gasfitting Module

TP001 1 Drawing

TP002 2 Calculations, science and communication

TP003 3 Sanitary plumbing drainage welding and cutting

TP004 4 Roof plumbing and solders

TP005 5 Water supply and gasfitting

TP006 6 Sheet lead and sheetmetal

TP007 7 Roof plumbing

TP008 8 Copper tube and mild steel sections

TP009 9 Drawing and building cost

TP010 10 Roof plumbing

TP011 11 Sheetmetal

TP012 12 Roof plumbing

TP013 13 Gasfitting and heaters

TP014 14 Welding and cutting

TP015 15 Mild steel sections

Sanitary General and Gasfitting Module

TP016 A51 Sanitary plumbing

TP017 A52 Drainage

TP018 A53 Water supply

TP019 A54 Sheet lead

TP020 A55 Copper tube and plastics

TP021 A56 Sanitary plumbing

TP022 A57 Drainage

TP023 A58 Water supply

TP024 A59 Gasfitting

TP025 A60 Welding and cutting

TP026 A61 Sheet lead and plastics

TP027 A62 Mild steel sections

TP028 A63 Copper tube and special materials

TP303 A64 Plumbing — Sanitary Theory 3 Final

TP304 A65 Plumbing — Sanitary General and Gasfitting Practice 3 Final
Course structure **T23A**

Mechanical Services, General and Gasfitting

Module

TP029  Q51 Heating
TP030  Q52 Ventilating
TP031  Q53 Water supply
TP032  Q54 Mild steel pipe
TP033  Q55 Copper tube and plastic
TP034  Q56 Heating
TP035  Q57 Ventilating, air-conditioning and refrigerating
TP036  Q58 Water supply
TP037  Q59 Gasfitting
TP038  Q60 Welding and cutting
TP039  Q61 Mild steel pipe and plastic
TP040  Q62 Mild steel section
TP041  Q63 Copper tube special materials
TP035  Q64 Plumbing — Mechanical Services
TP036  Q65 Plumbing — Mechanical Services
TP037  Q66 Plumbing — Gasfitting Theory 3 Final
TP038  Q67 Plumbing — General Theory 3 Final

Course structure **32CDA** under review

Hours per week (Day release)

Modules 1 to 12, 12 hours per week. This is achieved by attendance of 8 hours one week and 16 hours the following week.

Modules 13 to 20, 8 hours per week.

Modules 21 to 28, 8 hours per week.

**Alternate method**

Hours per course (Block release)

Modules 1 to 12, 400 hours per year (5 x 80 hours)

Modules 13 to 20, 320 hours per year (8 x 40 hours)

Modules 21 to 28, 320 hours per year (8 x 40 hours)

Advanced study subjects of the modular course

Students wishing to undertake advanced study subjects may apply to the head of department.

**Technician courses**

**81210E Technician Certificate Plumbing**

(Heating, Ventilating and Air-conditioning)

Career potential

The purpose of the course is to train qualified tradesmen in the more advanced techniques of air-conditioning installations, to develop in technicians the expertise necessary for the supervision of complex air-conditioning installations and to train qualified tradesmen to provide adequate support to management in large air-conditioning organisations.

Prerequisites

Students should have completed or be undertaking an apprenticeship course, in a trade related to the air-conditioning industry, to be eligible for the award of the certificate.

Entry is also permitted if, in the opinion of the Principal of the college, the applicant evidences the ability to complete the course successfully or is engaged in related employment.

Course structure

Area of study  Units

**Group 1 General**

(For students without approved Form V English, Mathematics and Science)

TH140 English 1T  2
TM130 Mathematics 1T  2
TM170 Science (Physics) 1T  2

Advanced or specialist units

TH240 English 2T  2
TM230 Mathematics 2T  2
TM270 Science (Physics) 2T  2

**Group 2 Related background studies**

TP237 Process Heating  1
TP238 Fluid Mechanics  1
TP180 Plant Services Drafting  2
TB220 Building Science 1A and 1B  2

Advanced or specialist units

TP421 Site Supervision and Organisation (Foremanship)  2
TP310 Contracts and Building Law (Subcontracts)  1
TP453 Mechanical Services Drafting  2

**Group 3 General practices**

TP358 Reticulated Systems 1T  2
TP450 Instrumentation  1

Advanced or specialist units

TP458 Reticulated Systems 2T  2
TP451 Electrical and Controls  1

**Group 4 Specialist practices**

TP348 Air-conditioning 1T  2
TP349 Refrigeration 1T  2

Advanced or specialist units

TP448 Air-conditioning 2T  2
TP449 Refrigeration 2T  2
TP452 Balancing and Commissioning  2

The student may select the order in which to attempt the subjects. The course will comprise 26 units —

All twelve units from Group 1

At least eight units from Groups 2 and 3

At least four units from Group 4.

**81211E Technician — Plumbing**

(Gasfitting)

Career potential

The course is designed to train qualified tradesmen in the more advanced techniques of installing and servicing modern gas appliances in building complexes.
Certificated technicians will have developed a particular expertise which will enable them to diagnose and rectify faults in more intricate modern gas installations.

Prerequisites

Students must be registered with the Plumbers and Gasfitters Registration Board or be undertaking the relevant apprenticeship course, to be eligible for the award of the certificate.

Entry is also permitted if, in the opinion of the Principal of the college, the applicant evidences the ability to complete the course successfully or is engaged in related employment.

Course structure

1st year

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH140</td>
<td>English 1T</td>
<td>2</td>
</tr>
<tr>
<td>TM130</td>
<td>Mathematics 1T</td>
<td>2</td>
</tr>
<tr>
<td>TM170</td>
<td>Science 1T</td>
<td>2</td>
</tr>
</tbody>
</table>

Trade subjects completed or modules 1—15.

2nd year

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH240</td>
<td>English 2T</td>
<td>2</td>
</tr>
<tr>
<td>TM230</td>
<td>Mathematics 2T</td>
<td>2</td>
</tr>
<tr>
<td>TM270</td>
<td>Science 2T</td>
<td>2</td>
</tr>
<tr>
<td>TP237</td>
<td>Process Heating (1 semester)</td>
<td>2</td>
</tr>
<tr>
<td>TP238</td>
<td>Fluid Mechanics (1 semester)</td>
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</tr>
</tbody>
</table>

Trade subjects completed or modules 16—28.

3rd year

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP358</td>
<td>Reticulated Systems 1T</td>
<td>2</td>
</tr>
<tr>
<td>TP335</td>
<td>Gas Technology 1T (Fundamentals of Gas Technology A and B)</td>
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</table>

4th year

<table>
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<th>Course name</th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td>TE161</td>
<td>Electronics B*</td>
<td>2</td>
</tr>
<tr>
<td>TP434</td>
<td>Gas Technology 2T A (gas control techniques 1A and 1B)</td>
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<tr>
<td>TP435</td>
<td>Gas Technology 2T B (gas control techniques 2A and 2B)</td>
<td>2</td>
</tr>
</tbody>
</table>

*Electronics Aand B equal TE326 Industrial Electronics 1T

81213E Technician — Plumbing (Sanitary)

Career potential

The purpose of the course is to train qualified tradesmen in the more advanced techniques of complex modern sanitary installations; to develop in technicians, the expertise necessary for the supervision of complex sanitary installations and to train qualified tradesmen to provide adequate support to management in large plumbing organisations.

Prerequisite

Students must be registered with the Plumbers and Gasfitters Registration Board or be undertaking the relevant apprenticeship course.

Entry is also permitted if, in the opinion of the Principal of the college, the applicant evidences the ability to complete the course successfully or is engaged in related employment.

Course structure

Area of study Basic Units (No.)

Group 1 General

(For students without approved Form V English, Mathematics and Science)

TH140 English 1T (2)
TM130 Mathematics 1T (2)
TM170 Science (Physics) 1T (2)

Advanced or specialist units (No.)

TM230 Mathematics 2T (2)
TM270 Science (Physics) 2T (2)
TP210 Communication and Technical Reports (2)

Group 2 Related background studies

TP316 Quantity Surveying (Plumbing) (2)
TP310 Contract and Building Law (1)
TP421 Site Supervision and Organisation (Foremanship) (2)

TP260 Plan Reading (1)
TP262 Building Science 1A and 1B (2)

Advanced or specialist units (No.)

TP263 Estimating and Quantity Surv. (Plumbing) (2)
TP261 Business Practice and Bookkeeping (1)
TP238 Fluid Mechanics (1)

Group 3 General building practices

TP240 Construction Methods and Practices (1)
TP420 Plant and Equipment (Plumbing) (1)

Group 4 Specialist practices

TP340 Pipeline Design A (1)
TP341 Pipeline Design B (1)
TP418 Drainage Design (1)

Advanced or Specialist units (No.)

TP320 Basic Measuring and Levelling (Plumbing) (1)
TP480 Water Service Design (2)

The student may select the order in which to attempt the subjects. The course will consist of 26 units —

All twelve units from Group 1
At least eight units from Groups 2 and 3
At least four units from Group 4

81212E Technician — Plant Services Detail Drafting

Entrance standard


Trade training is not a prerequisite for the course. Applicants who have successfully completed a technician course will be considered to have completed the necessary entrance requirements and may be entitled to some subject exemptions.

Course structure

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP181</td>
<td>Pipe and Duct Fitting 1T</td>
<td>3</td>
</tr>
<tr>
<td>TP180</td>
<td>Plant Services Drafting 1T</td>
<td>3</td>
</tr>
<tr>
<td>TP182</td>
<td>Building (parameters) Appreciation 1T</td>
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<tr>
<td>Approved elective</td>
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</table>

2nd year

<table>
<thead>
<tr>
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<th>Course name</th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td>TP281</td>
<td>Pipe and Duct Fitting 2T</td>
<td>3</td>
</tr>
<tr>
<td>TP280</td>
<td>Plant Services Drafting 2T</td>
<td>4</td>
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<tr>
<td>TP282</td>
<td>Plant Equipment 1T</td>
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3rd year

<table>
<thead>
<tr>
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<th>Course name</th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td>TP380</td>
<td>Plant Services Drafting 3T</td>
<td>4</td>
</tr>
<tr>
<td>TP382</td>
<td>Plant Equipment 2T</td>
<td>2</td>
</tr>
<tr>
<td>Approved elective</td>
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</tbody>
</table>

TC18
Building subject details

Advanced Building Graphics (TB120)
Techniques of graphic communication applied to building.

Air-conditioning 1T (TP348)
The study of air, temperature, humidity, the gas laws and how to use them. Change of state from liquid to vapour; superheated vapours and the use of steam tables. Psychrometry covering humidity, dew point, wet and dry bulb temperatures and measurement of air conditions and instruments used.

Air-conditioning 2T (TP448)
Methods of reducing noise and vibration from equipment and pipe work. Air-conditioning systems and arrangements of equipment. Duct design, external and internal heat loads. Moisture transfer. Air-cooling and spray equipment.

Applied Geomechanics (TB584)

Balancing and Commissioning (TP452)
Principles and methods used to commission and balance air-conditioning systems. Use of instruments and report sheets. Basic computations. Practical balancing and commissioning in laboratory.

Basic Measuring and Levelling (plumbing) (TP320)
Efficient use of the dummy level, automatic and other measuring instruments. Measurement procedures and the application of theory in practical situations.

Basic Quantities and Estimating (TB242)
An introduction to quantity taking and estimating in the building industry.

Builders Quantities (TB440)
The subject covers the basic principles for measuring the quantities and preparing order lists of materials required by all building trades concerned with the erection of simple, designed buildings of orthodox construction, and is to be studied for two hours per week for two semesters.

Building Administration and Supervision (TB426)
Approached from the points of view of the builder, the client and public authorities.

Building Appreciation 1T (TP182)
To familiarise the student with terms used in the building industry and to develop the ability to read architectural drawings in conjunction with mechanical drawings and extract relevant information and dimensions.

Building Construction 1A (TB216)
Basic principles of structure. Timber technology. Domestic building construction including timber framing, brickwork, masonry, foundations, footings, roof plumbing, joinery, internal fittings, services, plastering, painting. Simple concrete work.

Building Construction 1B (TB217)
A folio of drawings covering eight selected topics, appropriate to the grade, to be submitted for examination at the end of the year. Some of the drawings will be solutions to given problems.

Building Construction 2A (TB322)
Building Construction 2B (TB323)
A folio of drawings covering eight selected topics, appropriate to the grade, to be submitted at the end of the year for examination. Drawings will be solutions to given problems.

Building Construction 2C (TB427)

Building Construction 3A (TB412)

Building Construction 3B (TB413)
A folio of drawings covering eight selected topics, appropriate to the grade, to be submitted at the end of the year for examination. Drawings will be solutions to given problems.

Building Construction 3C (TB428)
Design principles applied to structures.

Building Community Development (TB516)
Development of communities and the building used. The interactions of both in social and economic terms.

Building Mathematics (T) (TB125)

Building Science (T) 1A and 1B (TB220)

Building Science 1A and 1B (building surveyors) (TB430)

Building Science 2A and 2B (TB320)
To extend work covered in Building Science 1 and to give students a practical, basic working knowledge of the important areas of modern building services.

Building Surveying (T) Theory, Mathematics, Field (TB417)
Areas of plane figures and volumes of solids. Use of levelling instruments (dumpy, theodolite, etc.). Measuring distances, recording observations, datum points, bench marks, grades, bearings.

Business Practice and Basic Bookkeeping (plumbing) (TP261)
Basic accounting concepts, basic data processing, accounting for contractors, office accounting techniques.

Carpentry and Joinery Modules

Module 1 (TB051), Simple base structures, basic tool skills.

Module 2 (TB052), Simple timber wall framing.

Module 3 (TB053), Simple timber roofing — skillion and gable.

Module 4 (TB054), Simple doors — ledged and braced — flywire.

Module 5 (TB055), Simple windows — Casement frame and sash.

Module 6 (TB056), Timber fencing and gates.

Module 7 (TB057), Timber villa construction — sub-floor structure to include set wall plates.

Module 8 (TB058), Timber villa construction — wall framing.

Module 9 (TB059), Timber villa construction — ceiling and gable roof framing.

Module 10 (TB060), Timber villa construction — simple hip roofing.

Module 11 (TB061), Door and door frames (Domestic).

Module 12 (TB062), Window joinery — double hung sash with patented balances rectangular louver.

Module 13 (TB063), Window joinery — double hung sashes in box frame.

Module 14 (TB064), Simple stairs — timber and concrete.

Module 15 (TB065), Brick veneer construction and hand saw sharpening.

Module 16 (TB066), Hip and valley roofing.

Module A51/B51 (TB071), Concrete formwork.

Module A52 (TB072), Hip and valley roofing 1 (equal pitch).

Module A53/B53 (TB073), Internal fixing.

Module A56/C56 (TB074), Stair building 1.

Module A57 (TB075), Hip and valley roofing 2 (unequal pitch).

Module A58 (TB076), Shoring, centres and levelling.

Module B52 (TB077), Formwork for concrete and systems.

Module B55 (TB078), Industrial roofing, trusses and ceilings.

Module B57 (TB079), Site works, setting out and levelling.

Module B58 (TB080), Large centres, shoring and trenches.

Module C52/D52 (TB081), Joinery 1 (doors, windows and louvres).

Module C53/D53 (TB082), Joinery 2 curved work.

Module C57 (TB083), Stair building 2.

Module C58 (TB084), Stair building 3.

Communication (TH115)
The examination of methods of collecting, organising, evaluating and presenting factual information. Oral presentations, report writing, letters, memos and media analysis.

Communication and Technical Reports (TP210)
To develop skills in all aspects of communication and report writing as applied to the building industry with particular reference to communications between project operations and head office, plus, the necessity to maintain accurate records. The course will comprise: methods of communication, clear thinking and summary writing, preparation and presentation of reports, application of graphics, operations requiring records, records filing, oral reports, conducting meetings.

Construction Methods and Practice (plumbing) (TP240)
To develop an understanding of structural systems and their organisation with particular reference to the effect on plumbing systems.

Contracts and Building Law (TB110) and (TP310)
The role of the architect in building, the obligations of the architect and builder, types and conditions of contracts, tenders and building requirements.
Crane Drivers, Dogmen and Crane Chasers (TB920) and (TB921)  
A course based on the theoretical requirements for crane drivers, dogmen and crane chasers as defined in the Lifts and Cranes Act, Victoria.

Drainage Design (TP418)  
Development of skills in the drafting and design of sanitary drainage installation relating to sewerage regulations. Installation and connection requirements for special apparatus.

Electrical and Controls (TP451)  
S1 units, DC and AC supplies, single and three phase supplies, power factor, efficiency, power, motor starting, motors, safety and operating controls, wiring diagrams. Control terminology, two position control, floating control and control diagrams.

English 1T (TH140)  
Development of ability to read with comprehension and appreciation. Practice in oral and written English. Preparation of clear, concise notes and summaries.

English 2T (TH240)  

English (Building Technician) (TH145)  

English Report Writing (Library and Thesis) (TB431)  
see Communication (TH115)

Estimating and Costing (TB362)  
To develop skills in general methods of detailed estimating and costing used for the purpose of tendering. Measuring and adjusting related to variations to contracted work.

Estimating and Quantity Surveying (plumbing) (TP263)  
To develop techniques and skills in estimating, pricing, cash flow and related matters, including pricing, overhead and profit, tenders, rise and fall considerations, progress payments.

Fluid Mechanics (TP238)  

Foundations 1A and 1B (TB408)  

Mathematics 1T (TM130)  
Two hours per week, daytime or evening. Full year. Prerequisites: Year 10 mathematics or equivalent and adult entry. Assessment: Periodic tests and assignments and a final three hour examination in November. This course is aimed at teaching basic mathematics of algebra and trigonometry and assumes very limited pre-entry knowledge of these areas. Topics covered are Fundamental Operation of Arithmetic and Algebra, Transpositions, Graphs, Trigonometry, Factorisation, solution, equations both linear and quadratic and logarithms.

Mathematics 2T (TM230)  
Two hours per week, evening over two semesters. Mathematics 1T, adult entry, or qualifications deemed equivalent by the Mathematics/Science Head of Department. Assessment: Class work (40%) and one final examination (60%). An extension of Mathematics 1T the topics include: review of basic algebra, advanced units in algebra, graphs of special functions, analysis of experimental data, advanced units in trigonometry, arithmetic and geometric progressions, statistics.

References  
Supplied notes


References used are supplied notes.
Mathematics 1A and 1B (IH) (TM120)

Five hours per week, daytime for one semester or two hours per week, evening for two semesters.

Assessment: consists of class work (30%) and a final examination (70%).

This unit deals with the following areas of mathematics: equations and formulae, relations and functions, trigonometry and an introduction to calculus. It is designed as a preparatory mathematics course leading to the mathematics 2H unit.

References

Mathematics 2H (TM220)

Full-time. Five hours per week, daytime for one semester.

Part-time. Two hours per week daytime or evening for two semesters. Prerequisites. TM120 Mathematics 1H. Assessment consists of one external examination paper for qualifying students.

The subject consists of the following topics for which assignments must be completed. Trigonometry; differentiation from first principles; techniques of differentiation; equation of tangents and normals; graphs of polynomial functions; integration and antidifferentiation; antidifferentiation; complex numbers; small increments and approximations; calculus and ratios; mean and root mean square; work; volume of revolution; differential equations; optimisation theory; centre of mass, centroids and second moments of area; parallel and perpendicular axis theorem; centre of pressure. Revision tests are also included throughout the year.

References
No set text is required. Booklets covering the subject are supplied. The following texts are recommended for background reading.


Network Scheduling for Critical Path Analysis (TB530)

Network planning and construction applicable to the building industry.

Pipe and Duct Fitting 1T (TP181)

This subject is designed to give the student a basic knowledge of the types of tools and materials used for the fabrication and installation of pipe and duct systems. Basic elementary use of these tools and materials.

Pipe and Duct Fitting 2T (TP281)

A practical exercise in the fabrication and installation of different components of a ducted heating system.

Pipeline Design 'A' Sanitary Plumbing (TP340)

To develop an understanding of theoretical consideration of factors governing the design of sanitary plumbing installations as required by the Victorian Standard Sewerage Code and the Melbourne and Metropolitan Board of Works By-laws. The principles of sketching of designs to obtain detailed information.

Pipeline Design 'B' (TP341)

To apply the requirements of the Victorian Standard Sewerage Code and the Melbourne and Metropolitan Board of Works to the drafting and design of sanitary plumbing installations. To develop drafting skills necessary to prepare sanitary plumbing pipeline design drawings.

Plan Reading (plumbing) (TP260)

Review the principles of specification report writing and understand the structure and use of specifications and drawings.

Plant and Equipment (plumbing) 1T (TP420)

Basic principles of the care and use of equipment, safety regulations and correct procedures.

Plant Equipment 1T (TP282)

The study of mechanical services equipment such as boilers, chillers, pumps etc. their operation and methods of control.

To develop the ability to sketch and draw schematic plant room layouts incorporating equipment, pipework, valves and controls.

Plant Equipment 2T (TP382)

The study of low velocity, high velocity, dual duct, and multi-zone air-conditioning systems, and associated equipment such as fans, housings, coils, ductwork, mixing boxes, registers, controls and piping.

Plant Services Drafting 1T and 2T (TP180, TP280)

Deals with detailing of elements of systems and layouts of relatively simple systems associated with the heating, ventilating, air-conditioning and refrigerating services. The work performed will be in line with the work covered in the subjects Pipe and Duct Fitting 1T and 2T.

Plant Services Drafting 3T (TP380)

Layouts of the more complex systems associated with mechanical services are developed in this subject. A high standard of draftsmanship together with a meticulous attention to detail and appropriate degrees of accuracy is required of all students.

Plumbing and Gasfitting Modules

Phase 1:

Orientation: safety tools, materials and gauges, building terms.

Modules 1 to 12: related instruction, trade drawing, geometry, developmental drawing and pattern cutting.

Trade science — properties of materials. Action of water on materials, force, principle of moments, the pulley, capillarity, heat and temperature, ventilation.


Sheet metal: jointing and fabricating models based on pattern cutting.

Phase 2:

Modules 13 — A55

Trade theory: water supply for domestic services. Head and pressure of water, storage tanks, defects in water services and industrial services, garden sprinkler systems, flushing cisterns, country water supply.

Drainage: materials, principles, design, drain plans, fittings for industrial and trade purposes. Sanitary plumbing
Phase 3:
The foreman’s work including powers and duties in a company, implications of contracts, human relations and problem solving, project organisation, clerical recording and employment considerations.


Modules A56—A63
Trade Theory —Sanitary Plumbing: multiple fixtures up to five storeys, sewerage pipe systems, fixtures for industrial and trade purposes, pipe-sizing and estimating.

Drainage: design and installation polluted areas. Septic tanks. Water supply, residential, industrial and special services. Pressurised services. Filtration and treatment of water, pumps and ejectors, flush valves. Hot water — residential and industrial services.

Gasfitting natural gas: planning and sizing, commercial and industrial requirements. Automatic controls, regulators. Liquid petroleum gas — single and two stage systems.


Modules Q51-Q63
Heating: heating equipment, types, piping systems, water heating.

Ventilating, air-conditioning and refrigerating: types of systems, equipment, temperatures.

Water supply: planning, storage, design, source of supply, pressure, special services.

Mild steel pipe, copper tube and plastics: bends and offsets, straight, angle and branch joints.

Mild steel sections: flat, angle and round, applications and welding.

Gasfitting — natural, LP blended: planning, pressures, principles and installation, conversion, safety.

Welding and cutting: oxy-acetylene, electric and argon — techniques.

Site Supervision and Organisation (Foremanship) (TP421)
Dealing with the administrative and supervisory aspects of the foreman’s work including powers and duties in a company, implications of contracts, human relations and problem solving, project organisation, clerical recording and employment considerations.

Practical Inspection (building) (TB436)
Designed to train potential building inspectors to inspect construction. The aims of inspection include: protection to owners, builders and workers, prevention of unsound practices and strict adherence to codes of material and craftsmanship.

Practical Structures and Practical Workshop (TB366)
This subject should provide students with a practical appreciation of the physical and mechanical properties of materials, and their application as basic components of structure.

Process Heating (TP237)

Professional Practice of a Building Surveyor (TB601)
Administration and law. Town planning. Building regulations.

Quantity Surveying 1 and Quantity Surveying H (TB503, TB502)

Quantity Surveying (plumbing) (TP316)
To develop basic skills in the taking off of quantities in preparation for estimating and pricing; including units of measurement, simple quantities, standard mode of measurement, bills of quantities.

Quantity Surveying 2 (TB552)
Quantity Surveying 2 is planned to develop the student’s usefulness in employment and includes the measurement of more complicated structures. The year’s work should include the measurement of excavator, concreter, bricklayer, carpenter, joiner and sundry metalwork items.

Refrigeration 1T (TP349)
The theory of heating and cooling of liquids and vapours. The study of the vapour compression cycle using ammonia, R12 and R22 refrigerants. Description of refrigeration equipment and different types of refrigerants. Sizing of refrigeration equipment.

Refrigeration 2T (TP449)
The study of compressors, volumetric efficiency, compressor losses, multi-stage compressors, flooded systems, capacity control, matching components in a VC system; absorption refrigeration and heat transfer. System faults in a simple VC system. Refrigeration piping design. Application of refrigeration for preservation of food and air-conditioning.

Reticulated Systems 1T (TP358)
Designed to cover the principles of all services associated with the heating, ventilation, air-conditioning and refrigeration installations. Several field excursions are undertaken to provide the necessary introduction to each type of service.

Reticulated Systems 2T (TP458)
Covers control components, specialised material selection, Standards Association requirements and controlling authorities.

Rigger 1 and 2 (TB801, TB802)
A course designed for an adult person engaged in rigging work erecting, dismantling or demolition of buildings, structures, and machinery.

Rigger 3 (TB803)
Instruction sufficient to enable the scaffoldor to erect, alter or dismantle heavy-duty suspended scaffolding and heavy-duty swing-stage scaffolding.

Rigger 4 (TB804)
Instruction sufficient to enable the scaffoldor to erect, alter or dismantle light-duty swing-stage scaffolding and boatswain’s chair.

Role and Function of a Clerk of Works (TB520)
A study of terms of employment, ethics and duties of a clerk of works.
Scaffolding Construction (TB901, TB902)
Class 1: Instruction sufficient to enable the scaffolder to erect, alter or dismantle pole scaffolding, both tube and timber and frame scaffolding.
Class 2: Instruction sufficient to enable the scaffolder to erect, alter or dismantle cantilever and bracket scaffolding.

Scaffolding Inspection A and B (TB435, TB439)
Covers interpretation of scaffolding regulations, defines responsibilities of all persons involved in the provision, erection, and use of scaffolding, including steel tube, frames, suspended cantilever bracket, ladders and miscellaneous equipment.

Science 1T (TM170)
Two hours per week, day or evening over two semesters. Prerequisites. Year 10 science or equivalent and adult entry. Assessment. Periodic tests and assignments and a final three hour examination in November. The course is aimed at teaching basic physics in S.I. units, vectors, equilibrium, kinematics, Newton’s three laws of motions, work power and energy, heat, Ohm’s law and basic electric circuits. References are supplied notes. Students enrolled in TM170 normally study mathematics 1T (TM130) concurrently, the two subjects are time-tabled in a four-hour block.

Science 2T (TM270)
Two hours per week evening over two semesters. Prerequisites; Science 2T, adult entry, or qualifications deemed equivalent by the Mathematics and Science, Head of Department. Assessment; Class work (40%) and one final examination (60%). An extension of Science 1T, the topics include: electricity and magnetism, advanced units in electric circuits, fluid statics, fluid dynamics, optics and wave motion, thermodynamics, notational dynamics.

Students enrolled in TM270 normally study mathematics (TM230) concurrently, the two subjects being time-tabled in a four-hour block.

References
Supplied notes.

Services in Buildings (TB241)
A study of services to, from and within a building or site, including electrical, mechanical, hydraulic, civil and interior decoration services.

Site Organisation and Administration (TB160)
The general aim of this subject is to develop further, the student's ability to administer the on-site activities that occur during the day to day activities of a construction company.

Social Science (TB134)
Participation in activities which will provide a background for students following a building career.

Specifications 1A and 1B (TB280)
This subject is intended to be studied in breadth rather than in depth. It is intended to be an introduction to specifications and to give the student an awareness of the importance of specifications. It is also proposed that Specifications 1 be a prerequisite to Specifications 2.

Specifications, Drawing Interpretations and Co-ordination (TB419)
Study of the interrelationship of contract documents (including drawings, specifications and related architect’s instructions) and the documentation of matters arising therefrom.

Statutory Control of Buildings (TB437)
Administration and law. Regulatory control and inspection procedure.

Structural Design Drafting 1A and 1B (TB307)
Usual prerequisites for this subject are passes in Structural Drafting and Structural Practices. The subject is concerned with design drafting practice in a variety of realistic situations.

Structural Design Drafting 2A and 2B (TB407)
Further work in extension of Structural Design Drafting 1A and 1B, Structural Design Drafting 2C and 2D (TB507).

Structural Drafting 1A and 1B (TB195)
Usual prerequisite for this subject is a pass in Leaving Technical Drawing A. Course includes practical drafting and lectures on use of steel sections, splicing, connections, standard drawing practice. Structural terms, reinforced concrete, timber.

Structural Drafting 2A and 2B (TB295)
Usual prerequisite is a pass in Structural Drafting 1H. Project drafting work and necessary theory in structural features, external features multi-storey buildings, large industrial building, composite type building, concrete projects, detailing from an engineering specification.

Structural Mechanics 1A and 1B (TB197)
Review of statics, external forces acting on rigid bodies, principles of equilibrium, internal forces within rigid bodies. Load-deformation characteristics of materials. Structural joints and connections. Laboratory work.

Structural Mechanics 2A and 2B (TB297)
Extends structural mechanics 1A and 1B and deals with more complicated structures.

Structural Mechanics 3A and 3B (TB397)
Further extension of Structural Mechanics 1A and 1B, 2A and 2B.

Structural Practices 1A and 1B (TB196)
Designed to give an appreciation of surveying theory and practice and an introduction to the construction and structural consideration of industrial type buildings.

Structural Practices 2A and 2B (TB296)
Extends Structural Practices 1H and also includes industrial building roof design and multi-storey building construction.

Survey Cartographic Drafting 1H (TB132)
Introduction to modern survey instrumentation. Topographical, hydrographic, underground geodetic and cadastral surveys. Introduction to town planning. Drafting and examination of field notes.

Survey 1H Parts 1 and 2 (TB144, TB250)
Details of this subject have not as yet been determined.

Technical Reports (building) (TB222)
Summaries, comprehension, records used in industry, types of reports (written and oral). Logical argument and the use of the spoken word. Use of library material. Uses of visual aids in reports.

Water Service Design (TP480)
To develop skill in the design and drafting of water supply reticulation services, flushing services and fire services.
business studies division

- Staff ......................................... TC26
- Business courses .......................... TC26
- Subject details ............................. TC32
- Kew High Evening School Department . . . TC27, 36
Business Studies Division
Head
P.C. Quail, BEc, DipEd

Business Studies Department
Head
To be appointed

Academic staff
K. Allen, BCom, DipEd
Maria Aronfeld, DipAcc, DipEd, AASA
R.W. Conn, BBus, DipEd, AASA
C.P. Davies, BEc, DipEd
June M. Harrison, BA
Janet Mullen, TTTCC
Ruth C. Murray, DipSecPrac, TTTCC
Ann Negri, BA(Hons), TTTCC
Gayle S. Newport, BCom, DipEd
A.H. Parks, BCom, DipEd, AASA(Prov)
Gwen L. Scott, DipCommPrac, TTTCC
Gail R. Williams, BEc, DipEd, AASA(Prov)
Lynette D. Wynton, AssocDipPSP

Divisional Secretary
Jennifer L. Simpson, CertBus (Secretarial)

Computer Centre
Supervisor
Lee S. Collier, BSc, DipEd
Kew High, Evening School Principal
J. Berry, BSc, DipEd

Business certificate courses

The following certificate courses are offered by the Business Studies Department:

Accounting
Book-keeper/Typist
Office Administration
Personnel
Production
Sales and Marketing
Secretarial
Supply
Work Study

Students may complete the Accounting Certificate or Book-keeper/typist Certificate or the Secretarial Certificate on a full-time day basis over 2 years.

Students pursuing other certificate courses may attend for one full year in common subjects followed by 2 years part-time evening studies in specialised subjects.

All of the above courses are also offered on a part-time evening basis involving 4-5 years study.

Specialist areas

In addition to the above areas of study a wide range of specialist units may be incorporated by attending other technical colleges for a few subjects. These include:

- Advertising
- Materials handling
- Banking
- Packaging
- Book trade
- Public relations
- Building societies
- Real estate
- Clothing
- Records administration
- Credit management
- Safety
- Customs procedures
- Timber
- Hospital procedures
- Transport
- Insurance — general
- Travel
- Insurance — life
- Tourism
- Law

Any students interested in these specialist areas should also enquire for advice regarding a plan of study.

Entrance requirements

The usual entrance requirement is Leaving standard of education (year eleven), but mature-age students may be granted admission to the course without this qualification.

Career potential

The general aim of the course is to provide a variety of sub-professional courses which are designed to suit the needs of potential section of department supervisors, senior clerical staff, industrial supervisors, sales supervisors, accounting staff and other supporting staff with specialist areas of responsibility.
Higher qualifications
These courses are recognised for the purpose of admission to membership of a number of professional institutes.

Applications for exemptions

CBS units passed at other Colleges
If a Victorian Certificate of Business Studies unit has been passed at an institution other than Swinburne it is not necessary to apply for an exemption. The unit will count towards a Certificate regardless of where it was studied. When applying for your Certificate simply provide the awarding college (the college where you passed the last unit) with result statements from the colleges where you studied the other units.

Subjects other than CBS units
(a) Where less than twelve units are applied for: these are granted by Swinburne and the application forms are available from student records. The head of the business studies department should be consulted if the student requires advice.
(b) Where more than twelve units are applied for: these applications can only be granted by the Curriculum Board of the State Council for Technical Education. Application forms are available from and must be submitted to the head of the business studies department.

Practical experience
Students cannot be granted an exemption solely on the basis of practical experience.

Specialist units
Students will not be granted exemptions for all the specialist units in a particular course. They are required to pass at least two Certificate of Business Studies specialist units.

General rules for granting exemptions
1. Credit will not be given for subjects which are below Australian university entrance standard, i.e. the equivalent of Higher School Certificate.
2. Credit will be given only if there is a substantial overlap of topics, except where:
   (a) A person has passed a general education subject and seeks exemption in an unrelated general education subject: e.g. HSC Politics would give an exemption in Australian Social Structures. No more than one of this type of exemption will be granted.
   (b) If alternative subjects provide a suitable basis for study in an area of specialisation then exemptions may be granted for introductory specialist units even though the content of the alternative subject does not overlap.

Provision of additional information
If the alternative subject is not part of a well-known course such as HSC it may be necessary to provide details on the:
(a) subject matter covered by the syllabus
(b) length of the course and
(c) assessment methods used.

Sighting of original documents
Photocopied documents supporting applications must be marked 'original sighted' by an officer of the college, therefore it is suggested that applications be submitted in person to Student Records so that original documents are not left at the college.

Early application
It is advisable to apply for exemptions as soon as possible after enrolling. This will allow you to select subjects at re-enrolment knowing exactly which units are needed to complete the course; it also avoids problems caused by possible changes in the rules for granting exemptions.

Approval time
Applications are checked by heads of departments before being recommended to the Business Studies Division Board which meets monthly. Exemptions for Middle-Level English and Business Mathematics must be recommended by the heads of Humanities and Mathematics and Science respectively. After approval, letters of notification are prepared and rechecked, therefore students should expect this process to take approximately 2 months.

Further information
Additional details about these certificate courses are available from:
Mr P.C. Quail,
Head of the Business Studies Division,
Telephone 819 8249 or 819 8358

Kew High — Evening School Department
Head Mr J. Berry
Telephone 859 8063

Educational evening classes offered by Kew High School, come under the administrative control of Swinburne Technical College. A wide range of HSC (year twelve), year eleven and general interest subjects are available. These are listed after the business studies subject information, at the end of this section.

Business Studies
Units of the Certificate of Business Studies are divided into three groups:

Group 1 Business Orientation — general units common to all certificates, e.g. Behavioural Studies 1A, Business Mathematics 1A.

Group 2 Business Practice — specialist units pertaining to individual courses, e.g. Personnel 1A for the Personnel Certificate.

Group 3 Middle-management practices, e.g. Middle-management Practices A.

823306 Certificate of Business Studies —
Accounting

Career potential
The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate —
(1) support staff for professional officers and higher level management, including department supervisors, senior clerical staff and staff with important specialist areas of responsibility. e.g. assistant accountants.

(2) smaller operators who need to be proficient in a variety of technical or business tasks as well as management decision-making.

Prerequisites

Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course structure

Compulsory units

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
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<tbody>
<tr>
<td>TH126</td>
<td>Middle-level English 1A</td>
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<tr>
<td>TH127</td>
<td>Middle-level English 1B</td>
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<tr>
<td>TS101</td>
<td>Accounting 1 (Bookkeeping to trial balance)</td>
</tr>
<tr>
<td>TS102</td>
<td>Accounting 2 (Preparation of financial reports)</td>
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<tr>
<td>TS103</td>
<td>Accounting 3 (Accounting systems)</td>
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<tr>
<td>TS204</td>
<td>Accounting 4 (Partnership and company accounting)</td>
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<tr>
<td>TS205</td>
<td>Accounting 5 (Financial management)</td>
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<tr>
<td>TS210</td>
<td>Data Processing 1 (This subject has a value of two units)</td>
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Plus three of the following units

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<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>TS206</td>
<td>Accounting 6 (Costing elements)</td>
</tr>
<tr>
<td>TS207</td>
<td>Accounting 7 (Costing systems)</td>
</tr>
<tr>
<td>TS208</td>
<td>Accounting 8 (Internal control &amp; auditing)</td>
</tr>
<tr>
<td>TS209</td>
<td>Accounting 9 (Budgeting procedures)</td>
</tr>
<tr>
<td>TS210</td>
<td>Accounting 10 (Accounting Theory)</td>
</tr>
<tr>
<td>TS211</td>
<td>Accounting 11 (Introduction to taxation)</td>
</tr>
<tr>
<td>TS212</td>
<td>Accounting 12 (Income tax law and practice)</td>
</tr>
<tr>
<td>TS213</td>
<td>Accounting 13 (Government Finance and Accounting Part 1)</td>
</tr>
<tr>
<td>TS214</td>
<td>Accounting 14 (Government Finance and Accounting Part 2)</td>
</tr>
</tbody>
</table>

Plus four of the following units

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM110</td>
<td>Business Mathematics 1A</td>
</tr>
<tr>
<td>TM111</td>
<td>Business Mathematics 1B</td>
</tr>
<tr>
<td>TS238</td>
<td>Introduction to Economics 1A</td>
</tr>
<tr>
<td>TS239</td>
<td>Introduction to Economics 1B</td>
</tr>
<tr>
<td>TS243</td>
<td>Introduction to Law 1A</td>
</tr>
<tr>
<td>TS244</td>
<td>Introduction to Law 1B</td>
</tr>
<tr>
<td>TS215</td>
<td>Behavioural Studies 1A</td>
</tr>
<tr>
<td>TS216</td>
<td>Behavioural Studies 1B</td>
</tr>
</tbody>
</table>

Four Elective units

Any of the above units not already selected. Any other Certificate of Business Studies units except Accounting Principles, and some units offered by other colleges but not offered by Swinburne e.g. Small Business Procedures 1A, 1B.

Note Twenty units are required for the Certificate, the groupings shown above must be observed.

Duration of course

This course is offered on either a two-year full-time or a four-year part-time studies basis.

Membership of associations

Students completing the course are academically qualified for admission as members of the Institute of Affiliate Accountants.

Students who complete the course including Accounting 11 and Accounting 12 are academically qualified for registration as tax agents.

**82339G Certificate of Business Studies — Book-keeper/Typist**

Career potential

The general aim of this certificate course is to provide a middle-level vocational course designed for students who wish to become book-keeping/typists rather than secretaries.

The course provides an excellent background in accounting while a high degree of typewriting skill is achieved. After completion of the course students will have developed skills suitable for employment in accounting firms, legal firms, accounting departments of large firms and other professional offices.

Prerequisites

Students are eligible to enter this course of study if they have completed satisfactorily an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course structure

Compulsory units

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH126</td>
<td>Middle-level English 1A</td>
</tr>
<tr>
<td>TH127</td>
<td>Middle-level English 1B</td>
</tr>
<tr>
<td>TS101</td>
<td>Accounting 1 (Bookkeeping to trial balance)</td>
</tr>
<tr>
<td>TS102</td>
<td>Accounting 2 (Preparation of financial reports)</td>
</tr>
<tr>
<td>TS103</td>
<td>Accounting 3 (Accounting systems)</td>
</tr>
<tr>
<td>TS204</td>
<td>Accounting 4 (Partnership and company accounting)</td>
</tr>
<tr>
<td>TS205</td>
<td>Accounting 5 (Financial management)</td>
</tr>
<tr>
<td>TS210</td>
<td>Data Processing 1 (This subject has a value of two units)</td>
</tr>
</tbody>
</table>

Plus four units from the following

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH226</td>
<td>English C</td>
</tr>
<tr>
<td>TS215</td>
<td>Behavioural Studies 1A</td>
</tr>
<tr>
<td>TS216</td>
<td>Behavioural Studies 1B</td>
</tr>
<tr>
<td>TS238</td>
<td>Introduction to Economics 1A</td>
</tr>
<tr>
<td>TS239</td>
<td>Introduction to Economics 1B</td>
</tr>
<tr>
<td>TS243</td>
<td>Introduction to Law 1A</td>
</tr>
<tr>
<td>TS244</td>
<td>Introduction to Law 1B</td>
</tr>
<tr>
<td>TS128</td>
<td>Industry and Society</td>
</tr>
<tr>
<td>TM110</td>
<td>Business Mathematics 1A</td>
</tr>
<tr>
<td>TM111</td>
<td>Business Mathematics 1B</td>
</tr>
</tbody>
</table>

Five elective units: Any other Certificate of Business Studies units not already selected, except Accounting Principles.

Note Twenty units are required for the Certificate. The groupings shown above must be observed.

Duration of course

This course is offered on a two year full-time basis only.

**82338G Certificate of Business Studies — Office Administration**

Career potential

The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate —
(1) support staff for professional officers and higher level management, including department supervisors, senior clerical staff and staff with important specialist areas of responsibility. e.g. office supervisors.

(2) smaller operators who need to be proficient in a variety of technical or business tasks as well as management decision-making.

Prequisites
Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course structure

Compulsory units

TH126 Middle-level English 1A
TH127 Middle-level English 1B
TM110 Business Mathematics 1A
TS117 Office Practices 1A
TS118 Office Practices 1B
TS101 Accounting 1 (Book-keeping to trial balance)
TS102 Accounting 2 (Preparation of financial reports)
TS224 Middle-management Practices A
TS225 Middle-management Practices B
TS324 Middle-management Practices C
TS325 Middle-management Practices D

Plus two units from Group 2 Business Studies units. These include the following subjects, others may be taken if desired:

TS103 Accounting 3 (Accounting systems)
TS204 Accounting 4 (Partnership and company accounting)
TS205 Accounting 5 (Financial Management)
TS160 Salesmanship A
TS161 Salesmanship B
TS170 Supply Procedures 1A
TS171 Supply Procedures 1B
TS120 Data Processing 1 (This subject has a value of two units)

Plus seven elective units from

Any certificate of Business Studies units not already selected.

Note: Twenty units are required for the Certificate. The groupings shown above must be observed.

Duration of course
This course is offered on a part-time evening basis or the first half of the course can be completed in one year on a full-time basis with the second half on a part-time evening basis.

Membership of associations
Students who are undertaking this course are eligible to apply for student membership of the Institute of Personnel Management of Australia. Students who complete the course successfully and are employed in the personnel area may apply for full membership.

82332G Certificate of Business Studies — Personnel

Career potential
The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate —

(1) support staff for professional officers and higher-level management, including department supervisors, senior clerical staff and staff with important specialist areas of responsibility. e.g. personnel officers.

823346 Certificate of Business Studies — Production

Career potential
The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate —

(1) support staff for professional officers and higher-level management, including department supervisors, senior clerical staff and staff with important specialist areas of responsibility. e.g. production managers.
(2) smaller operators who need to be proficient in a variety of technical or business tasks as well as management decision-making.

Prerequisites

Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course structure

Compulsory units

TH126 Middle-level English 1A
TH127 Middle-level English 1B
TM110 Business Mathematics 1A
TM111 Business Mathematics 1B
TS128 Industry and Society
TS129 Introduction to Business — Service Organisations
TS215 Behavioural Studies 1A
TS216 Behavioural Studies 1B
TS150 Production Techniques 1A
TS151 Production Techniques 1B
TS250 Production Techniques 2A
TS251 Production Techniques 2B
TS170 Supply Procedures 1A
TS171 Supply Procedures 1B
TS270 Supply Procedures 2A
TS271 Supply Procedures 2B

Plus two units from group two other than those already selected.

Two elective units

Any other Certificate of Business Studies unit.

Note Twenty units are required for the Certificate. The groupings shown above must be observed.

Duration of course

This course is offered on a part-time evening studies basis or the first half of the course can be completed in one year on a full-time basis with the second half of the course on a part-time evening basis.

Membership of associations

Students completing the course are required to complete four additional subjects to be academically qualified for admission to the Australian Marketing Institute at Associate Diploma level.

Students completing the course are academically qualified for admission as members of the Australian and New Zealand Marketing Association and as Associate members of the Australian Institute of Management.

82335G Certificate of Business Studies — Sales and Marketing

Career potential

The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate —

(1) support staff for professional officers and higher level management, including department supervisors, senior clerical staff with important specialist areas of responsibility, i.e. sales supervisors, sales managers.

(2) smaller operators who need to be proficient in a variety of technical or business tasks as well as management decision-making.

Prerequisites

Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course detail

Compulsory units

TH126 Middle-level English 1A
TH127 Middle-level English 1B
TM110 Business Mathematics 1A
TM111 Business Mathematics 1B
TS238 Introduction to Economics 1A
TS239 Introduction to Economics 1B
TS243 Introduction to Law 1A
TS244 Introduction to Law 1B
TS215 Behavioural Studies 1A
TS216 Behavioural Studies 1B
TS160 Salesmanship A (Previously Sales 1A)
TS161 Salesmanship B (Previously Sales 1B)
TS260 Sales Management A (Previously Sales 2A)
TS261 Sales Management B (Previously Sales 2B)
TS227 Marketing Principles A (Previously Marketing Principles and Practice A)
TS228 Marketing Principles B (Previously Marketing Principles and Practice B)
TS101 Accounting 1 (Bookkeeping to trial balance)
TS102 Accounting 2 (Preparation of financial reports)

Two elective units

Any other Certificate of Business Studies units.

Note Twenty units are required for the Certificate. The groupings shown above must be observed.

Duration of the course

This course is offered on a part-time evening studies basis or the first half of the course can be completed in one year on a full-time basis with the second half of the course on a part-time evening basis.

Membership of associations

Students completing the course are required to complete four additional subjects to be academically qualified for admission to the Australian Marketing Institute at Associate Diploma level.

Students completing the course are academically qualified for admission as members of the Australian and New Zealand Marketing Association and as Associate members of the Australian Institute of Management.

82337G Certificate of Business Studies — Secretarial

Career potential

The general aim of this certificate course is to provide a middle-level vocational course designed for students who wish to become secretaries to middle-level management.

Students are admitted with or without a background of stenographic skills, additional time being allocated within the course for the development of these.

Prerequisites

Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.
Course detail

Compulsory units

TH126  Middle-level English 1A
TH127  Middle-level English 1B
TM110  Business Mathematics 1A
TM111  Business Mathematics 1B
TH243  Introduction to Law 1A
TH244  Introduction to Law 1B
TS170  Supply Procedures 1A

Also eight units from the following

TH226  English C (This subject has a value of two units)
TS215  Behavioural Studies 1A
TS216  Behavioural Studies 1B
TS238  Introduction to Economics 1A
TS239  Introduction to Economics 1B
TS243  Introduction to Law 1A
TS244  Introduction to Law 1B
TS248  Industry and Society
TS129  Introduction to Business/Service Organisations
TM110  Business Mathematics 1A
TM111  Business Mathematics 1B

Four elective units

Any other certificate of Business Studies units including any of the above not already selected.

Note Twenty units are required for the Certificate. The groupings shown above must be observed.

Duration of Course

This course is offered on a two year full-time basis only.

8233G Certificate of Business Studies — Supply

Career potential

The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate—

(1) support staff for professional officers and higher level management, including department supervisors, senior clerical staff and staff with important specialist areas of responsibility, i.e. purchasing and supply officers.

(2) smaller operators who need to be proficient in a variety of technical or business tasks as well as management decision-making.

Prerequisites

Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course detail

Compulsory units

TH126  Middle-level English 1A
TH127  Middle-level English 1B
TM110  Business Mathematics 1A
TM111  Business Mathematics 1B
TH243  Introduction to Law 1A
TH244  Introduction to Law 1B
TS170  Supply Procedures 1A

Plus one of the following units

TS224  Middle-management Practices A
TS225  Middle-management Practices B

Plus four of the following units

TS129  Introduction to Business — Service Organisations
TS214  Supply Procedures 1B
TS270  Supply Procedures 2A
TS271  Supply Procedures 2B

Four elective units

Any of the units above not already selected. Any other approved business studies units.

Note Twenty units are required for the Certificate. The groupings shown above must be observed.

Duration of the course

This course is offered on a part-time evening studies basis or the first half of the course can be completed in one year on a full time basis with the second half of the course on a part-time basis.

Membership of associations

Students completing this course are academically qualified for admission as Associate members of the Institute of Purchasing and Supply.

82336G Certificate of Business Studies — Work Study

Career potential

The general aim of this certificate course is to provide a range of middle-level vocational courses designed to educate—

(1) support staff for professional officers and higher level management, including department supervisors, senior clerical staff and staff with important specialist areas of responsibility, e.g. work study practitioners.

(2) smaller operators who need to be proficient in a variety of technical or business tasks as well as management decision-making.

Prerequisites

Students are eligible to enter this course of study if they have satisfactorily completed an approved course at Leaving level or an approved equivalent course or are considered to be sufficiently mature and experienced enough to undertake the course successfully.

Course detail

Compulsory units

TH126  Middle-level English 1A
TH127  Middle-level English 1B
TM110  Business Mathematics 1A
TM111  Business Mathematics 1B
TS129  Introduction to Business — Service Organisations
TF184  Work Methods Improvement 1A
TF185  Work Methods Improvement 1B
TF182  Work Measurement 1A
TF183  Work Measurement 1B
TF284  Work Methods Improvement 2A
TF285  Work Methods Improvement 2B
TF286  Work Methods Improvement 2C
Business subject details

Accounting (TS009)

Full year accounting course for students with limited or no prior knowledge of book-keeping or accounting.
Topics covered include: basic concepts and terminology; the accounting equation; recording methods; balance day adjustments; final reports; accounting procedure for control; accounting for multiple ownership and analysis and interpretation of final reports.

Accounting 1 (TS101) (Previously Accounting 1A)

Book-keeping to Trial Balance - Forms of business ownership and types of business activities. Basic outline of accounting conventions. Requirements for business records and basic business documents to maintain records. Complete manual book-keeping process for sole trader service and trading businesses (using physical inventory method only), including bank reconciliation statements, imprest petty cash system, and subsidiary ledgers for debtors and creditors.

Accounting 3 (TS103) (Previously Accounting 1B)

Relevance of and necessity for flow charting and coding of data within accounting systems. Essential features of equipment used to maintain systems using either manual, semi-automatic or electronic equipment. Essential features of control and recording for the following systems using either manual, semi-automatic or electronic equipment - stock, payroll, debtors, creditors, cash receipts and payments and fixed assets.

Accounting 2 (TS102) (Previously Accounting 1C)

Preparation of financial reports. Diagram of the entire book keeping process from source documents including balance day adjustments to final reports. Balance day adjusting entries in the general journal and general ledger for incorporation in final reports. Adjusted trial balance entries to close the revenue and expense accounts to trading and profit and loss accounts and transfer net profit and loss to proprietorship accounts.

Classified revenue statement and balance sheet from trial balance and adjustments for a sole proprietor in both a service or trading organisation. Reversing entries. Final accounting reports for a sole proprietor, using a single entry system of book keeping, in both a trading and service organisation. Preparation of suitably classified manufacturing statements, and incorporating the cost of production in the revenue statement for a manufacturing organisation; (Sole proprietorship only). Revenue statements showing departmental profit and final profit and loss for a sole proprietor. The recording involved in the setting up and maintenance of records between head office and a maximum of two branches with goods transferred at cost. Consolidated reports of head office and one branch incorporating the allocation of expenses.

Records and accounting reports for non-trading organisations.

Accounting 4 (TS204) (Previously Accounting 2A)

Partnership & Company Accounting. Essential differences between partnership and company forms of business ownership. Reasons for converting an existing business into a partnership or company. Formation of partnerships and companies and basic contents of documents involved. Journal and general ledger entries for; the formation of a partnership and the admission of a partner to an existing business. Journal and general ledger entries in a company’s books for; the formation of a company, the issue of shares to the public by a public company, the acquisition of the assets and liabilities of another business and the settlement of the purchase consideration with the previous proprietor(s).

Statutory and other registers and records relating to the
shares of a company. Profit and loss appropriation statement and a balance sheet of a partnership. Legal obligations of reporting, preparation of a profit and loss statement (including appropriation of a profit) and a balance sheet for a company in accordance with the Ninth Schedule of the Companies Act and professional standards.

Accounting 5 (TS205) (Previously Accounting 2B)

Accounting 6 (TS206) (Previously Accounting 2C)

Accounting 7 (TS207) (Previously Accounting 2D)

Accounting 8 (TS208) (Previously Accounting 2E and 2F)

Accounting 9 (TS209) (Previously Accounting 2G)
Budgeting procedures, preparation of budgets for the annual profit plan. The course concentrates on operating and financial budgets for manufacturers but also deals with retail and service businesses. The control function of budgets is emphasised with the preparation of performance reports at all stages of the budgeting process.

Accounting 10 — Accounting Theory
The main object of this unit is to provide the student with an appreciation of the role of accounting in society; the history of accounting; professional accounting bodies; accounting postulates, principles, doctrines and conventions and accounting standards.

In addition the course involves the study of the problems associated with historical cost accounting, and a number of methods of accounting for changing price levels including current purchasing power accounting, current value accounting, relative price change accounting, and COCOA.

The unit also covers alternative accounting methods for leases, company taxation and incorporate investments.

Accounting 11 (TS211) (Previously Accounting 2H)
Introduction to taxation, basic income tax procedures, group tax, payroll tax and sales tax, preparation of taxation returns for wage or salary earners, sole traders, use of appropriate Acts to aid this work.

Accounting 12 (TS212) (Previously Accounting 2I)
Income tax, calculation of taxable income for sole proprietors, partnerships, companies, trust and superannuation funds; the tax agent. Recognition of problems that require specialist advice. A pass in this unit provides an academic qualification for registration as a taxation agent.

Accounting 13 — Government Finance and Accounting Part 1
This unit is the first of two government accounting units which covers the history of general revenue collection; Commonwealth/State financial relations; the preparation, presentation and supporting documentation for the Government Master Budget; role and powers of the Auditor-General; the composition, powers, duties and procedures of the Public Accounts Committee and Executive Council; and financial control through accounting techniques, Audit Acts and Treasury regulations.

Accounting 14 — Government Finance and Accounting Part 2
Accounting for trading organisations and non-trade service organisations; the funds system of accounting; departmental budgets; principles of government accounting including sources of revenue, expenditure constraints, recording methods and documents; final reports for trading and non-trading public utilities and the statutory requirements for the reports.

Accounting Principles (TS109)
To enable the student to gain an insight into some of the tools, techniques and principles used in accounting. Topics include, accounting records and reports, balance day adjustments, types of business ownership and organisations, evaluation of accounting reports, break-even analysis and accounting terminology.

Advanced Business Typewriting 1A (TS180)
To enable the student, given material in various forms (e.g., manuscript, typescript, etc.) and material involving a range of requirements (e.g., carbon copies, notations etc.) to type accurate copies of various business communications (e.g., business letters, memorandums, business documents etc.) of normal syllabic intensity (1.35-1.44) at an average speed of 35 w.p.m. for at least 10 minutes on a specific task.

Advanced Business Typewriting 1B (TS181)
To enable the student, given material in various forms (e.g., manuscript, typescript etc.) and material involving a range of requirements (e.g., carbon copies, notations, etc.) to type accurate copies of various business communications (e.g., business letters, memorandums, business documents including payroll records and stencils — ink, spirit masters and offset paper masters), of normal syllabic intensity (1.35-1.44) at an average speed of 40 w.p.m. for at least 10 minutes on a specific task.

Advanced Business Typewriting 11A (TS280)
To enable the student, given material in various forms (e.g., manuscript, unarranged material, annotated notes etc.) and material involving a range of requirements (e.g., carbon copies, continuation sheets, etc.) to type accurate copies of various business communications (e.g., business letters, reports, financial statements etc.) of difficult syllabic intensity (over 1.45) at an average speed of 45 w.p.m. for at least 10 minutes on a specific task. To plan and make decisions relating to the most difficult typing tasks likely to be required in a business organisation.
Advanced Business Typewriting 11B (TS281)

To enable the student, given material in various forms (e.g. manuscript, unarranged material, annotated notes etc.) and material involving a range of requirements (e.g. carbon copies, continuation sheets etc.) to type accurate copies of various business communications (e.g. business letters, reports, financial statements including two-page balance sheets, reports containing formulae, foreign languages and footnotes, functional and flow-charts etc.) of difficult syllabic intensity (over 1.45) at an average speed of 50 w.p.m. for at least 10 minutes on a specific task.

Australian Social Structures (TS108)

The general purpose of this course is to add to our understanding of the society we live in. Special emphasis is placed upon the working environment. Areas of special study include: aborigines, unemployment, alternate living styles, the work ethic, organised labour, business attitudes and expectations, income distribution and the lucky country syndrome, world poverty, sexual culture, women in the workforce, job satisfaction.

Behavioural Studies 1A & 1B (TS215, 216)

Becoming aware of one's potentialities, interpersonal relationships, conflicts, difficult problem solving, sociology and psychology, limitations in handling certain situations and problems.

Business Mathematics 1A (TM110)

Coping with situations involving use of business mathematics, more specialised mathematics applicable to other subjects, acquiring skills to cope with statistical analysis.

Business Mathematics 1B (TM111)

Statistical processes used in business operations, related business and statistical vocabulary, solving business problems using statistical processes, using formulas and interpreting results.

Data Processing 1 (TS120)

Modern data processing techniques for the provision of information to management. Problems that exist in the operations of business systems, and methods to overcome these problems. How advanced business equipment operates. Data processing systems using manual, semi-automated and fully automated procedures. Program writing to solve simple problems. Specific areas covered include the preparation of suitable documentation for programs, system flow charts, the selection of appropriate input or output devices given particular problems and how they should be introduced.

Data Processing 2 (TS220)

Preparation of modern data processing systems, analysis of systems, and implementation of new systems.

Data Processing 3 (TS221)

Programming, using COBOL language.

English C

The course includes: training in library procedures and in the efficient use of library facilities for thorough and proper investigation of special topics; a detailed study of the techniques of report writing, including the search for and collation of information, its organisation and presentation in oral and written form; letter, memo and minute writing; acquaintance with the rules and procedures for the conduct of meetings.

Industrial Relations A (TS240)

The role and functions of the shop steward. Relationship between shop steward and union officials. The relationship between the shop steward and company personnel – supervisors, managers, etc. Employee and union-oriented rules (award, non-award; written, unwritten). Appreciation of written rules governing employee/management relationships at work. Functions of, and knowledge of, main management and union rules.

Industrial Relations B (TS241)

How awards are formulated and interpreted. Similarities and differences between collective bargaining, arbitration and conciliation. Intervention techniques prior to and during negotiations. Role of conciliation and arbitration commissioners. Conciliation and Arbitration Act. Structure and functions of State Wages Board. Functions of various employers organisations in the industrial relations area. Functions of government departments and the acts they administer in regard to industrial relations.

Industrial Relations C (Personnel 2B) (TS231)

The structure and function of the Australian Trade Union Movement. Employer organisations and the Conciliation and Arbitration Commission, the functions of government departments related to industrial relations, study experiments to improve the industrial environment.

Industrial Relations 1A & 1B (TS452)

A study of inter-relationship of management and the work force in the building industry.

Industry and Society (TS128)

The work ethic and the nature of work, the social responsibility for employers, growth of industrial enterprises and economic growth, primary, secondary and tertiary industry, consumerism, pricing, trade unions/employer organisations, population growth, the environment, the influence of government on industry and society.

Introduction to Business A — Service Organisations (Formerly Principles of Organisations) (TS129)

What is business? What does it do? Forms of ownership, non-profit organisations, internal organisation structure, functions of management, personal skills of managers, policy decision-making and documentation, general management tasks, basic business functions — financing, purchasing, staffing production, sales and marketing; operating techniques and controls of above.

Introduction to Economics 1A (TS238)


Introduction to Economics 1B (TS239)

Four out of the following six topics to be studied. Economic role of government, economic measurement, economic systems, international trade, the finance marker and the level of economic activity, the labour market.

Introduction to Law 1A (TS243)

Semester unit. Origins and operation of law in Australia. Use of law in personal, civic and business affairs; complexity of law.

Introduction to Law 1B (TS244)

Continued study of law, knowing when professional aid should be sought, legal position to employees, property and public, legal aspects of different types of business ownership.

Middle-management Practice A (Planning) (TS224)

Management as an integrated process, planning — nature of the planning process; activities, forecasting objective, policies and procedures, programs and schedules, budgeting, application.

Middle-management Practice B (Organisation) (TS225)

Department organisation, analysis, designing/re-designing a departmental organisation structure, factors affecting organisation specialisation, values and problems; alternative
structures, authority distribution, organisation charting, manpower requirements planning, job documentation, corporate organisation structure and relationship.

Middle-management Practice C (Staffing) (TS234)

This subject examines the main elements involved in the assessment of present and future manpower needs through: recruitment, selection, training and development appraisal, retirement, retrenchment, separations.

Middle-management Practice D (Leadership) (TS235)

This subject enables the student to develop leadership skills, identify the framework within which decision-making is practical, communicate effectively and to understand the problems which arise in the communications process. Use committees to solve problems effectively, motivate people within an organisational framework and become aware of various leadership styles and their application.

Marketing Principles A (TS227)

The meaning of marketing in our Australian society; marketing philosophies and organisation; the marketing environment; market research; segmentation of markets and consumer behaviour.

Marketing Principles B (TS228)

The planning of product, price, place and promotion strategies; development of the strategic plan; marketing decision-making and the social implications.

Materials Handling 1A & 1B (TS247) & (TS248)

Outlines the role and purpose of materials handling in the organisation of a business. Specific areas of study are: factors affecting costs, materials layout, flow processes, report writing, Acts and regulations, materials handling equipment.

Middle-level English 1A (TH126)

A general course in basic communication skills for a variety of purposes. The emphasis is upon competence in written and spoken expression, reading and research, and critical evaluation of the language of argument, literature, film and drama.

Middle Level English 1B (TH127)

The consolidation and application of communication skills in business and other organisational contexts: business writing (letters, memos, minutes, reports); speaking and listening (interviews, meetings, dictation); reading, research and critical interpretation of factual material (reports, newspaper and journal articles).

Office Administration 1A (TS117)

The organisation required in an office; supervision of office staff, use of specific clerical aids and office machines; development of communication procedures.

Office Administration 1B (TS118)

Processing of documents; effective document design and control; filing systems and office layout.

Personnel 1A (TS130)

Recruitment, selection and employment — responsibility of various parties, correct sequence of events in filling a vacancy, techniques and procedures involved.

Personnel 1B (TS131)

Understanding, interpreting and administering the active component of manual worker awards. Identifying and handling non-award matters related to wages. Application of site and other agreements to wage administration, especially where such agreements may interact with or supersede awards. Knowledge of approaches to wage-setting — fixed rate programs, development and maintenance of salary systems, white collar employees — award, non-award. How to determine up-to-date salary ‘market’ information. Application of Labour and Industry Act to non-award situations.

Fringe benefits — advantages and disadvantages. Application of EDP to salary and wage system.

Personnel 2A (TS230)

Safety and employee services — safety programs, health hazards and corrective action welfare, range and evaluation of employee services.

Personnel 2B (TS231)

This unit has been re-named ‘Industrial Relations C’. See details under that title.

Personnel 2C (TS232)

Manpower planning and development, main variable for personnel inventory; future staffing requirements, training programs, performance appraisal.

Personnel 2D (TS233)

The personnel function — historical development of personnel, understanding of personnel function of administrative practices; need for personnel specialist.

Production Techniques 1A (TS130)

Introduces manufacturing industries and sub-systems. Types of production organisations. Processes and controls applied in quantitative and graphical form enabling the conversion of market requirements into saleable inventory.

Production Techniques 1B (TS151)

Advancement in detail on 1A. Examining in detail manufacturing planning. Various scheduling and estimating techniques including effects of change.

Production Techniques 2A (TS250)

More sophisticated examination of the production management roles in organisation, policies, forecasting estimating and control to achieve economic operation of the company.

Production Techniques 2B (TS251)

Examines the practical methods of project management through the use of network planning, efficiency controls and problem solving techniques.

Salesmanship A (TS160)

Salesmanship: the role of the salesman; knowledge required to sell; an understanding of buyer psychology; selling and merchandising techniques; time usage and sales planning.

Salesmanship B (TS161)

Salesmanship: how to plan and conduct a sales presentation; opening the sale; use of sales aids; selling the benefits; overcoming objections; closing the sale and after sales service.

Sales Management A (TS160)

Sales Management: responsibilities and duties of the sales manager; sales forecasting and budgets; marketing and sales territory organisation; sales force planning; merchandising and sales promotion.

Sales Management B (TS261)

Sales Management: how to establish and manage a sales team; recruitment and selection; sales training; methods of control and motivation; sales appraisal systems and staff development.

Secretarial Practice (TS165)

Understanding role of secretary as an assistant to management, apply secretarial procedures, promote good human relations, skills of shorthand and typing, basis for more advanced studies.

Secretarial Projects A (TS265)

To enable students to receive an integrated course of training so that they can complete the duties of a secretary to intermediate level of management in regard to stenography, typing and general secretarial practice. To receive sufficient shorthand and typewriting practice to achieve a speed of 120 w.p.m. shorthand and 50 w.p.m. typing.
Secretarial Projects B (TS266)
To enable students to receive an integrated course of training so that they can complete the non-stenographic duties and responsibilities of a secretary to intermediate level of management, this subject is concerned mainly with secretarial office tasks and assignments. To have sufficient typewriting practice to achieve a speed of 50 w.p.m, in typing.

Shorthand (TS190)
Development of knowledge and skill in shorthand (Pitman's) as a preparation for other secretarial subjects to be taken later.

Supply Procedures 1A (TS170)
Basic principles in performing supply and purchasing function, procedures for operation and control of purchasing function.

Supply Procedures 1B (TS171)
Continuation of Supply 1A.

Supply Procedures 2A (TS270)
Principles and practice to perform supply and purchasing function, purchasing overseas.

Supply Procedures 2B (TS271)
Complete procedures for inventory control, functions related to materials management.

Work Methods Improvement 1A, 1B (TF184, 185)

Work Methods Improvement 2A, 2B (TF284, TF285)

Work Methods Improvement 2C, 2D (TF286, TF287)

Work Measurement 1A, 1B (TF182, TF183)

Work Measurement 2A, 2B (TF282, TF283)
Frequency studies. Interference to production. General data system. Statistical work sampling. Non-repetitive work measurement. Master clerical data. EPS resources contributing to capacity. Filing systems.

Work Measurement 3 (TF382)
Wage payment plans. Labour budgets and controls. Complete techniques project.

Kew High — Evening School Department
Subjects available

<table>
<thead>
<tr>
<th>HSC — Group 1</th>
<th>Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Literature</td>
<td>Asian History</td>
</tr>
<tr>
<td>French</td>
<td>Australian History</td>
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<tr>
<td>Applied Mathematics</td>
<td>Eighteenth Century</td>
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<tr>
<td>Pure Mathematics</td>
<td>History</td>
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<tr>
<td>General Mathematics</td>
<td>Accounting</td>
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<tr>
<td>Computer Science</td>
<td>Art</td>
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<tr>
<td>Biology</td>
<td>Legal Studies</td>
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<tr>
<td>Chemistry</td>
<td>Economics</td>
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<tr>
<td>Physics</td>
<td>Politics</td>
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<tr>
<td>Human Development</td>
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<tr>
<td>and Society</td>
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</tr>
</tbody>
</table>

HSC — Group 2

| Media Studies       | Applied Science                 |
| Drama               | Shorthand                       |
| Pre-HSC Workshops   | Typing                          |
| and Year 11         | Computer Studies                |

Further information
Additional details about evening classes are available from:
Mr J Berry
Principal
Kew High Evening School
Burke Road
EAST KEW 3102
Telephone: 859 8063
Staff .......................................................... TC38
Electrical and electronics courses .......................... TC39
Machines and materials courses ............................ TC43
Special courses ................................................ TC51
Subject details ................................................ TC52
Engineering Division

Head
M.M. Katz, BEng(Mech), BEd, DipMechEng, CertElecEng, TTIC, ARMIT, MIEAust, MAIRAH

Electrical and Electronics Department

Head
F.L. Smyth, TTIC, TechCert(Electronics), SEC A Grade Licence

Academic staff

J.L. Alarcon, BE(Elec/Comm), BE(Electronics), GradIEAust
M.M. Blonder, DipEng(Electronics), DipEd
A. Bolton, BAppSci, GradIREE, TechCert(Telecom)
R.M. Edwards, TTIC, SEC A Grade Licence, TechCert(Electronics)
B.T. Flanagan, TTIC, TechCert(Electronics)
F.A. Gaunt, TTIC, SEC A Grade Licence, TechCert(Electronics)
H. Hoenen, TTIC, Higher TechCert(Power), TechCert(Electronics), SEC A Grade Licence
F. Hutchison, TTIC, TechCert(Electronics), SEC A Grade Licence
B. Johnston, SEC A Grade Licence
D. Kottek, BE(Elec), DipEd, GradIEAust, MACS
D.V. McMahon, TTIC, SEC A Grade Licence
D.R. Mealy, BE(Elec)
J. Phillips, TechCert(Electronics), SEC A Grade Licence
W.H. Pratt, TTIC, SEC A Grade Licence, TechCert(Electronics)
G.H. Sutherland, DipEE
R.G. Warren, TTIC, TechCert(Electronics)
R.D. Wright, BA(Maths), Cert(Elec/Comm)

Machines and Materials Department

Head
G.N. Williams, TTIC

Academic staff

D. Amato, BEng(Mech), DipEd, GradIEAust
R.W. Barker, TechCert, TTIC
K. Battersby, TTIC
P. Bentley, DipProdEng
R.W. Berwick, TTIC
J.F. Brown, TTIC
K.J. Carmody, DipMechE, DipEd, MIEAust
M. Curvill, TechCert(MechDesign)
G. Dzioba, TTIC
J.M. Franklin, TTIC
D.J. Gaylard, TTIC
E.F. Hayes, MechEngCert, TTechIC
L.J. McLaughlan, TechCert, SMS, ME
F.S. McLucas, TTIC
J. Myles, TechCert, TTIC
E.G. Oliver, TTIC
K. O'Neill, TTIC
F. Sanstrom
S.D. Scott-Branagan, TTIC
R.S. Somerville, TTIC
A.J. Stapley, PhD, DipEd
P. Tomat, Cert. (Toolmaking)
Electrical and Electronic courses

The following courses are offered by the Electrical and Electronics Department:

Apprenticeship course (Electrical Mechanics)
A part-time day apprenticeship course of three years' duration designed to meet the requirements of the Industrial Training Commission of Victoria, the State Electricity Commission of Victoria and the Education Department of Victoria.
Minimum entry standards are laid down by the Industrial Training Commission of Victoria and are presently, year nine with passes in relevant subjects or the equivalent.
The course provides the necessary training to prepare an apprentice to pass electrical trade theory and practice at a level approved by the State Electricity Commission of Victoria for issue of the relevant 'B' Grade or 'A' Grade licence.
Note: Only persons licensed by the State Electricity Commission of Victoria may carry out electrical wiring work.

Post-trade course
8371E Electrical Contracting, Estimating and Supervision

Electrical technician courses
The courses offered are:
83510E Technician — Electrical (Electronics)
83511E Technician — Electrical (Drafting)
83512E Technician — Electrical (Power)
83513E Technician — Electrical (Motor Control)
The electrical technician courses provide valuable training in specialised fields for apprentices and tradesmen who wish to further their studies.
Apprentices who are taking a technician course concurrently with their trade training may be required to attend evening classes in addition to daytime trade training. Exemptions are granted for relevant subjects at year eleven level.
Tradesmen who undertake a technician course will be required, as a general rule, to attend classes on two evenings per week unless exemptions are granted for relevant subjects at year eleven level.
83570E Industrial Electronics Certificate course
A certificate is issued to all students who successfully pass all subjects in the three years of the industrial electronics course. The industrial electronics course may be studied at technician level.
An electrical tradesman can qualify for an electrical technician certificate by completing the outstanding subjects as listed under the electrical technician courses.

Certificate of Technology courses
Electronics — This course is designed for personnel working in the field of telecommunications. Enquiries are invited for admission to the course.

Electrical, and electrical drafting — these courses provide adequate training for persons working as aides to professional engineers whose interests are in the field of electrical power and its distribution.
The following Certificate of Technology courses offered provide the necessary academic training for the positions of technical officer, engineering assistant or engineering technician within the public service and private industry.
The training given during the course enables the student to supply technical support to the professional engineer, either with or without direct supervision and be able to relate to the trades personnel in the practical areas.
The students could be involved in any of the following areas in their employment: design development, installation, commissioning, operations or maintenance of plant or equipment associated with the electrical/electronics industry.
The courses offered are:
83520G Certificate of Technology (Electrical) — Power
83530G Certificate of Technology (Electronic), full-time
83531G Certificate of Technology (Electronic), part-time
83550G Certificate of Technology (Electrical) — Design Drafting
Each of the above courses is offered on either a full- or part-time basis.
To gain the certificate of technology qualification it is necessary for students to complete all subjects of the course and to have a minimum of two years of approved full-time work experience.

Membership of associations
Students completing the course are academically qualified for admission as graduate members of the Australian Institute of Engineering Associates.

Full-time study
These courses require two years full-time attendance over a period of three years.

Part-time study
The courses extend over a minimum of four years part-time day release or evening attendance.

Entrance requirements
Students must have year eleven standard in
English
Mathematics A
Mathematics B
Physics or a satisfactory result in Technician Science (A)
Technical Drawing (Graphics) for the Design Drafting course (not essential),
or approved equivalents — refer to the head of the department.
Mature-age students without the above qualifications are invited to discuss this with the head of the department.

**Exemptions**
Should be referred to the head of the department with suitable written evidence to support the claim.

**Enquiries**
Mr F. L. Smyth, 819 8493.

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**Apprenticeship course**

**83501D**  
**Apprenticeship: Electrical Mechanics**

**Entrance standard**
Satisfactory completion of year nine in a technical school, or an equivalent course, with passes in relevant subjects.

<table>
<thead>
<tr>
<th>Course structure</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>1st year</strong></td>
<td></td>
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<tr>
<td>TE001 Module 1 Electrical Wiring</td>
<td>)</td>
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<tr>
<td>TE002 Module 2 Electrical Wiring</td>
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<td>TE003 Module 3 Electrical Wiring</td>
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<td>TE004 Module 4 Electrical Wiring</td>
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<td>TE005 Module 5 Electrical Wiring</td>
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<tr>
<td>TE006 Module 6 Electrical Wiring</td>
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<tr>
<td>TE007 Module 7 Electrical Fitting</td>
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<tr>
<td>TE008 Module 8 Electrical Fitting</td>
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</tbody>
</table>

| **2nd year**     |       |
| TE009 Module 9 Electrical Wiring | ) |
| TE010 Module 10 Electrical Wiring | ) |
| TE011 Module 11 Electrical Wiring | ) |
| TE012 Module 12 Electrical Wiring | ) |
| TE013 Module 13 Electrical Wiring | 8 |
| TE014 Module 14 Electrical Wiring | ) |
| TE015 Module 15 Electrical Fitting | ) |
| TE016 Module 16 Electrical Fitting | ) |

| **3rd year**     |       |
| TE017 Module C51 Electrical Wiring | ) |
| TE018 Module C52 Electrical Wiring | ) |
| TE019 Module C53 Electrical Wiring | ) |
| TE020 Module C54 Electrical Wiring | ) |
| TE021 Module C55 Electrical Wiring | 8 |
| TE022 Module C56 Electrical Wiring | ) |
| TE023 Module C57 Electrical Wiring | ) |
| TE024 Module C58 Electrical Wiring | ) |

<table>
<thead>
<tr>
<th>External examinations (Education Department)</th>
<th>Required modules completed</th>
<th>Equivalent SEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject examined</td>
<td></td>
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<tr>
<td>TE301 Elec. Wiring Theory 3</td>
<td>to C54</td>
<td>'B' Gr. Th.</td>
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<tr>
<td>TE302 Elec. Wiring Prac. 2and 3</td>
<td>to C54</td>
<td>'B' Gr. Pr.</td>
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<tr>
<td>TE401 Elec. Wiring Theory 4</td>
<td>to C58</td>
<td>'A' Gr. Th.</td>
</tr>
<tr>
<td>TE402 Elec. Wiring Prac. 4</td>
<td>to C58</td>
<td>'A' Gr. Pr.</td>
</tr>
</tbody>
</table>

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**Post-trade course**

**83571E**  
**Electrical Contracting, Estimating and Supervision**

**Career potential**
Qualified electrical mechanics are employed by electrical contracting firms for the purpose of estimating the cost of an electrical installation.

There is a demand for electrical estimators employed by major electrical contracting firms. Many self-employed 'A' Grade Electrical Contractors find it necessary to do this course.

**Entrance requirements**
The prerequisite for enrolment is that the person is an 'A' Grade Electrical Mechanic or an electrical apprentice.
Course structure
The topics covered in this one year, four hours per week course, are as follows:

Costing procedures
Pricing
Specifications
Labour correction factors

Time study
Progress reports

Time sheets
Pricing of domestic, commercial and industrial jobs

Supervision procedures

Course structure

<table>
<thead>
<tr>
<th>Hours</th>
<th>Week</th>
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<td>2</td>
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<td>4</td>
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</table>

83512E Technician — Electrical (Power)

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<thead>
<tr>
<th>Hours</th>
<th>Week</th>
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<td>2</td>
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83513E Technician-Electrical (Motor Control)

<table>
<thead>
<tr>
<th>Hours</th>
<th>Week</th>
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<td>2</td>
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83570E Industrial Electronics Certificate course

Entrance standard
Satisfactory completion of two years of an electrical technician course or three years of an electrical trade course or an acceptable standard in any other approved course of study.

Course structure

<table>
<thead>
<tr>
<th>Hours</th>
<th>Week</th>
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</table>

Swinburne Technical College
Certificate of Technology courses

83520G Certificate of Technology (Electrical) — Power
835506 Certificate of Technology (Electrical) — Design Drafting

Course structure
To complete the academic portion of the above it is necessary to complete the core subjects listed and a minimum of 11 units of the electives listed, of which at least 4 units each, must be at Stage 3 and Stage 4.

<table>
<thead>
<tr>
<th>Core subjects (19 units)</th>
</tr>
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<tbody>
<tr>
<td><strong>Stage</strong></td>
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<td>or</td>
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</tbody>
</table>

Elective Subjects (all 2 units except those marked * which are 1 unit)

<table>
<thead>
<tr>
<th>Elective Subjects (17 units)</th>
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<tbody>
<tr>
<td><strong>Stage</strong></td>
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<tr>
<td>†being phased out</td>
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</tbody>
</table>

If a student is particularly interested in obtaining employment in the electrical drafting and design area, there are elective subjects which should be undertaken, i.e., Electrical Design 2, Electrical Drafting 2.
Machines and Materials courses

The following courses are offered by the Machines and Materials Department:

Apprenticeship courses
A part-time day apprenticeship course of three years duration, designed to meet the requirements of the Industrial Training Commission of Victoria. Students who have attended secondary technical schools may obtain exemptions from some modules depending on the standard reached at year ten or year eleven. Intake tests may be necessary to ensure exemption when an apprentice commences the apprenticeship course.

To qualify for proficiency pay, an apprentice must at the first attempt obtain a pass in all eight modules studied for that year of the course and obtain an average of at least 70 per cent for the eight modules.

To qualify for the certificate of proficiency, an apprentice must attain the standard shown below:
- Fitting and turning, turning and machining: a pass in basic modules 1 to 20 and any four alternative modules.

Technician courses
These courses provide training in the mechanical and production fields. Several courses are available within each field, and they provide valuable training for apprentices and tradesmen who wish to further their studies.

Apprentices, who are taking a technician course concurrently with their trade training, will be required to attend evening classes in addition to daytime trade training. Tradesmen who undertake a technician course will be required, as a general rule, to attend classes on two evenings per week. Some subjects are available in the day-time for students who can arrange release from work. The usual duration of a technician course is four years.

Certificate of Technology and Higher Technician courses
Mechanical Courses are based on a core of basic mechanical subjects and a wide range of elective subjects, which provide for the diverse needs of aides to professional mechanical engineers.

Production
Three streams are available in the field of production engineering. Jig and tool design, quality control and work study, are areas covered in these streams.

Design Drafting
Production (jig and tool), Mechanical

Students who are employed in drawing offices and possess the necessary qualifications may enter these courses. Three courses are available.

Post-apprentice and special courses

Fitting and Machining
This is an evening course in basic machine shop practice to provide engineering draftsmen, tradesmen’s assistants and others with the opportunity to complement their own areas of occupation.

It also provides younger students seeking apprenticeships, an insight into the type of work they would be engaged upon.

Toolmaking (Certificate)
Toolmaking is a post-apprenticeship (fitting and machining) course designed to provide advanced training for tradesmen. Classes are available during day and evening.

This course involves three years’ study and includes practical training in jig boring, tool and gauge manufacture and thread grinding. A certificate is awarded on completion of the course.

Welding
The welding courses cover the syllabus prescribed by the Education Department of Victoria to give instruction in all branches of oxy-acetylene and electric arc welding.

An education department certificate is granted to students who pass the final examination in grade three with 50% in theory and practice. With a pass mark of 65% in both theory and practice, a certificate from the Department of Labour and Industry (Boiler Inspection Branch) for the welding of pressure vessels may be obtained by the applicant, subject to satisfactory evidence of suitable industrial experience.

Courses incorporate:
- Welding of ferrous and non-ferrous metals, flame cutting and gouging, all-positional welding of plate pipe, rolled and hollow steel section, use of all types of electrodes, weld testing.
- For arc welding, courses are available for instruction in pressure pipe and stainless steel pressure plate to DLI standards. The welding section of this department is an approved school of instruction in welding of all phases for the purpose of the Boiler Code SAA CBI Part V.

Courses include:
- Oxy-acetylene cutting, welding of cast irons, all-positional welding, flame gouging — hand and machine, template work, marking and cutting of pipe and pipe templates, welding of non-ferrous metals, safety precautions, general information as required by a welder.

Day classes in welding are conducted as required for diploma students, technicians and second year metal fabrication apprentices.

Enquiries Mr R. Barker, 819 8122
Head Mr G. Williams, 819 8504.
Apprenticeship courses

83601D  Apprenticeship, Fitting and Machining

Career potential
A part-time day apprenticeship course of three years’ duration, or an accelerated course of 16 hours per week first year and 8 hours per week second year, designed to meet the requirements of the Industrial Training Commission of Victoria.

Entrance requirements
Students who have attended secondary technical schools may obtain exemptions from some modules depending on the standard reached at year ten or eleven. Intake tests may be necessary to ensure exemption when an apprentice commences the apprenticeship course.

To qualify for proficiency pay, an apprentice must at the first attempt obtain a pass in all eight modules studied for that year of the course and obtain an average of at least 70 per cent for the eight modules.

To qualify for the certificate of proficiency, an apprentice must attain the standard shown below:

Fitting and turning, turning and machining: a pass in basic modules 1 to 20 and any four alternative modules.

Course structure
Modular training
A module consists of the theory and practice together with the related knowledge required to perform a specified group of trade skills.

Eight hours each week for three years or 16 hours per week first year and 8 hours per week second year.

Course detail
- TF001/ Modules 1-15 – Theory, Practice and Related Studies
- TF016 Module 16 – Heat Treatment
- TF017/ Modules 17-19 – Theory, Practice and Related Studies
- TF019 Related Studies
- TF020 Module 20 – Revision and Craft exam
- TF021 Module A51 – General Fitting
- TF022 Module A52 – General Fitting
- TF023 Module A53 – General Fitting
- TF024 Module A54 – General Fitting
- TF025 Module B51 – Welding
- TF026 Module B52 – Welding
- TF027 Module B53 – Welding
- TF028 Module B54 – Welding
- TF045 Module F51 – Gear Cutting
- TF046 Module F52 – Gear Cutting
- TF047 Module F53 – Gear Cutting
- TF048 Module F54 – Gear Cutting
- TF053 Module H51 – Tool and Gauge Making
- TF054 Module H52 – Tool and Gauge Making
- TF055 Module H53 – Tool and Gauge Making
- TF056 Module H54 – Tool and Gauge Making
- TF089 Module C51 – Construction Equipment
- TF090 Module C52 – Construction Equipment
- TF091 Module C53 – Construction Equipment
- TF092 Module C54 – Construction Equipment

83603D  Boilermaking and Structural Steel Fabrication

General
This is an apprenticeship course. The first and second years only are conducted at Swinburne Technical College at present. Attendance is either one full day or two full days per week (8am-5pm).

Entrance requirements
All students must be indentured and registered as an apprentice with the Industrial Training Commission of Victoria. The normal prerequisite qualification for admission to this course is completion of year nine with passes in mathematics, science and drawing/graphic communication.

Course structure
The subjects taken are Theory, Drawing and Practice.

Each year of study consists of eight modules, which are made up of the three subjects.

<table>
<thead>
<tr>
<th>Course detail</th>
<th>Hours</th>
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<tbody>
<tr>
<td>TF601 Module 1 – Theory and Practice</td>
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<tr>
<td>TF602 Module 2 – Theory and Practice</td>
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<tr>
<td>TF603 Module 3 – Theory and Practice</td>
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<tr>
<td>TF604 Module 4 – Theory and Practice</td>
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<td>TF605 Module 5 – Theory and Practice</td>
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<td>TF606 Module 6 – Theory and Practice</td>
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<tr>
<td>TF607 Module 7 – Related Instruction</td>
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<td>TF608 Module 8 – Related Instruction</td>
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<td>TF609 Module 9 – Theory and Practice</td>
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<td>TF610 Module 10 – Theory and Practice</td>
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<td>TF611 Module 11 – Related Instruction</td>
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<td>TF612 Module 12 – Theory and Practice</td>
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<td>TF614 Module 14 – Theory and Practice</td>
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<tr>
<td>TF615 Module 15 – Related Instruction</td>
<td>1</td>
</tr>
<tr>
<td>TF616 Module 16 – Related Instruction</td>
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</tbody>
</table>

Technician courses

Entrance standard
These courses are available to apprentices who are prepared to undertake more study than is provided in the normal trade course. Students are usually required to complete English, Mathematics, Science and Technician Drawing at Leaving technical level at an early stage of the course. Minimum entry is satisfactory completion of a suitable year ten course.

Career potential
Technician courses are essentially extensions of apprenticeship training designed so that more able apprentices or tradesmen may undertake advanced trade training in order to equip themselves for positions such as detail draftsmen, technical assistants or to qualify for entrance to higher courses such as the Certificate of Technology.

Entrance requirements
To gain admission to a course an applicant must:
(a) be doing an apprenticeship course or be a qualified tradesman
(b) have approved prerequisite qualifications.

Minimum entry level is satisfactory completion of a suitable year ten course and the technician course is
designed to take four years on this basis. However for students with a higher entry level and for apprentices released for additional hours by their employers this time is reduced.

### 83610E Technician — Mechanical Refrigeration and Air-conditioning

**Course structure (for students with approved year 10 English, Mathematics & Science)**

Eight (8) basic units:

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Hours week</th>
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<tbody>
<tr>
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<tr>
<td>TM130</td>
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<tr>
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### 83611E Technician — Mechanical (Fluid Power)

**Course structure (for students with approved year 10 English, Mathematics & Science)**

Eight (8) basic units:

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### 83612E Technician — Mechanical (Thermal Plant)

**Course structure**

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<tr>
<td>TH240</td>
<td>English 2T</td>
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### 83613E Technician — Mechanical (Drafting)

**Course structure (for students with approved year 10 English, Mathematics & Science)**

Eight (8) basic units:

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<th>Subject</th>
<th>Hours week</th>
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### 83614E Technician — Production (Jig & Tool Drafting)

**Course structure (for students with approved year 10 English, Mathematics & Science)**

Eight (8) basic units:

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<th>Subject</th>
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<tr>
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Related background studies:

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Specialist practices:

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<th>Subject</th>
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<tbody>
<tr>
<td>TF359</td>
<td>Jig and Tool Drafting 1T</td>
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<tr>
<td>TF459</td>
<td>Jig and Tool Drafting 2T</td>
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<tr>
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### 83615E Technician — Production (Heat Treatment)

**Course structure (for students with approved year 10 English, Mathematics & Science)**

Eight (8) basic units:

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<thead>
<tr>
<th>Basic units</th>
<th>Code</th>
<th>Subject</th>
<th>Hours week</th>
</tr>
</thead>
<tbody>
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<td>TH140</td>
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<tr>
<td>TM130</td>
<td>Mathematics 1T</td>
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<td>TM170</td>
<td>Science 1T</td>
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</tr>
<tr>
<td>TM126</td>
<td>Technician Drawing T</td>
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<td>TH240</td>
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<td>TM230</td>
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<td>TM270</td>
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</tr>
<tr>
<td>TF227</td>
<td>Metalurgy 1T</td>
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<td></td>
</tr>
</tbody>
</table>

TC45
## Certificate of Technology courses

### 836206 Certificate of Technology — Mechanical

**Career potential**

Mechanical engineering at the certificate level involves trained people in the manufacture and construction of equipment in such diverse fields as earth moving and construction, special large-scale kitchens, general and special purpose mechanical and production plants.

People with a Certificate of Technology — Mechanical, are employed as works engineers i.e. engineers who maintain manufacturing equipment in order to ensure the smooth running of methods of production. They could also be employed in the area of development of new ideas and products.

**Entrance requirements**

The standard entry requirements for admission to the course are:

(a) Satisfactory completion of a year eleven course, including passes in English, Mathematics, Science and Technical Drawing/Engineering Graphics, to a standard approved by the College.

(b) Experience and maturity, sufficient to undertake the course.

Note As the entrance requirements are flexible, prospective students who do not fit exactly into the categories as shown should not be deterred from applying.

Students should be prepared to devote four years of part-time study to complete the course, although it is possible to complete two years (stages) of part-time study in one year of full-time study.

**Course structure**

The course consists of 30 units taken from the area below. Each area specifies the number of units to be taken. Each unit consists of two to three hours per week of study for a semester (three hours applies where practical work is involved).

**Membership of associations**

Students completing the course are academically qualified for admission as graduate members of the Australian Institute of Engineering Associates.

**General studies**

(Minimum of six units including units of communication and report writing).

<table>
<thead>
<tr>
<th>Basic units</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH115</td>
<td>Communications and Report Writing 2</td>
</tr>
<tr>
<td>TM220</td>
<td>Mathematics 2A and 2B (2H)</td>
</tr>
<tr>
<td>TM160</td>
<td>Physics 1A and 1B (1H)</td>
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<tr>
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<td>TS216</td>
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**Advanced**

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### 83617E Technician — Production (Method Study)

**Course structure** (for students with approved year 10 English, Mathematics & Science)

Eight (8) basic units:

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<th>Basic units</th>
<th>Hours</th>
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<tbody>
<tr>
<td>TH115</td>
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<tr>
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<td>TF318 Metallography 1T</td>
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**Specialist practices**

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**Basic practices**

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**Advanced specially**

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**Certificate of Technology courses**

### 83616E Technician — Production (Engineering, Inspection and Metrology)

**Course structure** (for students with approved year 10 English, Mathematics and Science)

Eight (8) basic units:

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**Basic practices**

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**Advanced specially**

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<th>Hours</th>
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</tr>
<tr>
<td>TF338</td>
<td>Instrumentation 1A and 2A</td>
<td>2</td>
</tr>
<tr>
<td>TE133</td>
<td>Electrical Drafting 1A/1B</td>
<td>2</td>
</tr>
<tr>
<td>TE234</td>
<td>Properties of Electrical Materials 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TB195</td>
<td>Structural Drafting 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TB197</td>
<td>Structural Mechanics 1A and 2A</td>
<td>2</td>
</tr>
<tr>
<td>TB196</td>
<td>Structural Practices 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TB408</td>
<td>Foundations 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF182</td>
<td>Work Measurement 1A</td>
<td>1</td>
</tr>
<tr>
<td>TF183</td>
<td>Work Measurement 1B</td>
<td>1</td>
</tr>
</tbody>
</table>

Advanced Units

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE210</td>
<td>Applied Electricity 2H</td>
<td>2</td>
</tr>
<tr>
<td>TE219</td>
<td>Circuit Theory 2H</td>
<td>2</td>
</tr>
<tr>
<td>TE260</td>
<td>Electrical Drafting 2H</td>
<td>2</td>
</tr>
<tr>
<td>TF420</td>
<td>Metrology 2A and 2B (2T)</td>
<td>2</td>
</tr>
<tr>
<td>TE233</td>
<td>Electrical Drafting 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TB295</td>
<td>Structural Drafting 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TB297</td>
<td>Structural Mechanics 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TB296</td>
<td>Structural Practices 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TF260</td>
<td>Jig &amp; Tool Drafting 2A and 2B</td>
<td>2</td>
</tr>
</tbody>
</table>

Basic practices

As required, but must include the following 12 units:
- Applied Mechanics 1A and 1B, 2A and 2B, 3A and 3B,
- Materials and Processes 1A and 2A, Drafting 1A and 1B,
- 2A/2B, 2A/2B.

Advanced practices

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF258</td>
<td>Mechanical Drafting 2AK and 2BK (internally assessed)</td>
<td>2</td>
</tr>
<tr>
<td>TF221</td>
<td>Applied Mechanics 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TF328</td>
<td>Applied Mechanics 3A and 3B</td>
<td>2</td>
</tr>
<tr>
<td>TF427</td>
<td>Applied Heat 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TF330</td>
<td>Materials and Processes 2A</td>
<td>1</td>
</tr>
<tr>
<td>TF478</td>
<td>Fluid Power 2A and 2B</td>
<td>2</td>
</tr>
</tbody>
</table>

Specialist practices

(as required)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF458</td>
<td>Mechanical Design 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF459</td>
<td>Machines and Mechanisms 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF479</td>
<td>Mechanics of Fluids and Fluid Machinery 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF448</td>
<td>Refrigeration and Air-conditioning 1AM and 1BM</td>
<td>2</td>
</tr>
<tr>
<td>TS431</td>
<td>Supervision 1A</td>
<td>1</td>
</tr>
<tr>
<td>TS432</td>
<td>Supervision 1B</td>
<td>1</td>
</tr>
</tbody>
</table>

Advanced Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF457</td>
<td>Mechanical Design 2A and 2B, 2C and 2D</td>
<td>4</td>
</tr>
</tbody>
</table>

836506 Certificate of Technology — Mechanical (Design Drafting)

Career potential

Mechanical design at the certificate level involves trained people in the design of equipment in such diverse fields as earth moving and road construction, equipment, special large scale kitchen equipment and general purpose mechanical and production plant.

People with a Certificate of Technology — Mechanical (Design Drafting), are employed as design draftsmen, chief draftsmen and project engineers.

Entrance requirements

The standard entry requirements for admission to the course are:

(a) Satisfactory completion of a year eleven course, including passes in English, Mathematics, Science and Technical Drawing/Engineering Graphics to a standard approved by the College.

(b) Experience and maturity, sufficient to undertake the course.

Note As the entry requirements are flexible, prospective students who do not fit exactly into the categories as shown should not be deterred from applying.

Students should be prepared to devote four years of part-time study to complete the course, although it is possible to complete two years (stages) of part-time study in one year of full-time study.

Membership of associations

Students completing the course are academically qualified for admission as graduate members of the Australian Institute of Engineering Associates.

Course structure

Area of study

General

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH115</td>
<td>Communication and Report Writing</td>
<td>2</td>
</tr>
<tr>
<td>TM220</td>
<td>Mathematics 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TM160</td>
<td>Physics 1A and 1B</td>
<td>2</td>
</tr>
</tbody>
</table>

Related background studies

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE110</td>
<td>Applied Electricity 1A and 1B</td>
<td>2</td>
</tr>
</tbody>
</table>

Basic practices

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF121</td>
<td>Applied Mechanics 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF327</td>
<td>Applied Heat 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF230</td>
<td>Materials and Processes 1A</td>
<td>1</td>
</tr>
<tr>
<td>TF308</td>
<td>Engineering Practices 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF378</td>
<td>Fluid Power 1A and 1B</td>
<td>2</td>
</tr>
</tbody>
</table>

Advanced practices

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF259</td>
<td>Mechanical Design 2AE and 2BE</td>
<td>2</td>
</tr>
<tr>
<td>TF327</td>
<td>Applied Heat 1A and 1B</td>
<td>2</td>
</tr>
</tbody>
</table>

Specialist practices

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF458</td>
<td>Mechanical Design 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF457</td>
<td>Mechanical Design 2A and 2B, 2C and 2D</td>
<td>4</td>
</tr>
</tbody>
</table>

Total 30

836226 Certificate of Technology — Production (Work Study)

Career potential

The work study certificate course is designed specifically to develop the special skills needed to become a work study officer.

Particular attention is given to work measurement, methods improvement, production planning, tooling and inspection methods; the ways and means of increasing manufacturing productivity, of making maximum use of staff and equipment, of guarding against accidents and of observing the law of the land especially if the manufacturing process involves noxious materials, obnoxious effluents and other safety
hazards. Some time is also devoted to behavioural sciences, communication and report writing, the basic principles of organisation and on the business side of things, an introduction to economics and data processing. The certificate course has a bias towards engineering to meet the requirements of industry, but areas of special interest to the student can be incorporated. It is also considered to be a sound basis for more advanced courses leading to higher qualifications in several fields.

**Entrance requirements**

The standard entry requirements for admission to the course are:

(a) Satisfactory completion of a trade technical course.

(b) Satisfactory completion of an approved course at year eleven level which has included English, Social Studies and Mathematics.

(c) Evidence of sufficient managerial potential to warrant undertaking further education.

**Note** Students should be prepared to devote four years of part-time study to complete the course.

Students completing the course are academically qualified for admission as graduate members of the Australian Institute of Industrial Engineers.

**Course structure**

The course consists of 22 core units and a minimum of eight elective units of which four must be from engineering practice and related studies.

**Core units**

<table>
<thead>
<tr>
<th>Basic Unit Code</th>
<th>Unit Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM110</td>
<td>Mathematics 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TM160</td>
<td>Physics 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TM115</td>
<td>Communication</td>
<td>2</td>
</tr>
<tr>
<td>TS215</td>
<td>Behavioural Studies 1A</td>
<td>1</td>
</tr>
<tr>
<td>TS216</td>
<td>Behavioural Studies 1B</td>
<td>1</td>
</tr>
<tr>
<td>TF184</td>
<td>Work Methods Improvement 1A</td>
<td>1</td>
</tr>
<tr>
<td>TF185</td>
<td>Work Methods Improvement 1B</td>
<td>1</td>
</tr>
<tr>
<td>TF182</td>
<td>Work Measurement 1A</td>
<td>1</td>
</tr>
<tr>
<td>TF183</td>
<td>Work Measurement 1B</td>
<td>1</td>
</tr>
<tr>
<td>TF370</td>
<td>Tooling and Inspection Methods</td>
<td>2</td>
</tr>
</tbody>
</table>

**Advanced**

<table>
<thead>
<tr>
<th>Unit Code</th>
<th>Unit Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF284</td>
<td>Work Methods Improvement 2A</td>
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</tr>
<tr>
<td>TF285</td>
<td>Work Methods Improvement 2B</td>
<td>1</td>
</tr>
<tr>
<td>TF286</td>
<td>Work Methods Improvement 2C</td>
<td>1</td>
</tr>
<tr>
<td>TF287</td>
<td>Work Methods Improvement 2D</td>
<td>1</td>
</tr>
<tr>
<td>TF282</td>
<td>Work Measurement 2A</td>
<td>1</td>
</tr>
<tr>
<td>TF283</td>
<td>Work Measurement 2B</td>
<td>1</td>
</tr>
<tr>
<td>TF382</td>
<td>Work Measurement 3</td>
<td>2</td>
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</tbody>
</table>

**Elective units**

<table>
<thead>
<tr>
<th>Unit Code</th>
<th>Unit Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF230</td>
<td>Materials and Processes 1A</td>
<td>1</td>
</tr>
<tr>
<td>TF121</td>
<td>Applied Mechanics 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF327</td>
<td>Applied Heat 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TF417</td>
<td>Production Processes and Development 1A and 1B</td>
<td>2</td>
</tr>
<tr>
<td>TS128</td>
<td>Industry and Society</td>
<td>1</td>
</tr>
<tr>
<td>TS129</td>
<td>Introduction to Business/Service Organisations</td>
<td>1</td>
</tr>
<tr>
<td>TS238</td>
<td>Introduction to Economics 1A</td>
<td>1</td>
</tr>
<tr>
<td>TS239</td>
<td>Introduction to Economics 1B</td>
<td>1</td>
</tr>
<tr>
<td>TS243</td>
<td>Introduction to Law 1A</td>
<td>1</td>
</tr>
<tr>
<td>TS244</td>
<td>Introduction to Law 1B</td>
<td>1</td>
</tr>
<tr>
<td>TS120</td>
<td>Data Processing</td>
<td>2</td>
</tr>
<tr>
<td>TS150</td>
<td>Production Techniques</td>
<td>1</td>
</tr>
<tr>
<td>TS151</td>
<td>Production Techniques 1B</td>
<td>1</td>
</tr>
<tr>
<td>TF330</td>
<td>Materials and Processes 2A</td>
<td>1</td>
</tr>
<tr>
<td>TF221</td>
<td>Applied Mechanics 2A and 2B</td>
<td>2</td>
</tr>
<tr>
<td>TF427</td>
<td>Applied Heat 2A and 2B</td>
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</tr>
<tr>
<td>TF450</td>
<td>Production Processes and Development 2A and 2B</td>
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<tr>
<td>TS250</td>
<td>Production Techniques 2A</td>
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</tr>
<tr>
<td>TS251</td>
<td>Production Techniques 2B</td>
<td>1</td>
</tr>
</tbody>
</table>

**836516 Certificate of Technology — Production (Tooling Design)**

Career potential

This course supersedes the Higher Technician Certificate Jig and Tool Design Drafting and is available only at Swinburne. The course has been designed to suit the requirements of industry in the areas of Jig and Tool Design, Press Tool Design and Moulding Tool Design.

Tooling design covers a very broad range of skills, as illustrated by the breakdown into three specialist areas of study. The Jig and Tool designer is mainly concerned with the 'making' equipment used in mass production to improve the quality and accuracy of the article and at the same time improve the rate of production.

The Press Tool designer is concerned with the dies used to manufacture such diverse articles as body panels for cars, refrigerators etc. or those required to stamp coins.

The Moulding Tool designer is concerned with the design of moulds used to manufacture anything from car and truck tyres, plastic body panels for electrical equipment such as drills for the handyman, right through to the moulding of nylon gears for slot cars.

**Entrance requirements**

Prerequisites for students entering the course are as follows:

(1) Standard prerequisite academic qualifications are passes in Leaving Technical English, General Mathematics (Technician), Technician Science A, Engineering Graphics (Unit 2) and Engineering Workshop Practice (Unit 2), or approved equivalent, or higher qualifications.

(2) To gain admission to the third and fourth years of the course an applicant must:

- (a) have completed the first and second years of the course.
- (b) be employed in a drawing office.
- (c) have had satisfactory engineering workshop experience. This may be the completion of the workshop practice modules of the fitting and machining apprenticeship course, or completion of Machine Shop Practice 1H and 2H from the Higher Technician Certificate in Jig and Tool Design, or approved works-based training.

Note Where Principals vary the prerequisite academic qualifications, students admitted without having reached the required standard in Engineering...
Graphics or Workshop Practice, will be required to undertake a preliminary course of study in these subjects.

Course structure

Students should be prepared to devote four years of part-time study to complete the course, although it is possible to complete two years (stages) in one year of full-time study.

1st year
- Units
  - Maths 2
  - Applied Mechanics 1 1
  - Mechanical Drafting (Production) 2
  - Communications and Report Writing 2
  - Ergonomics 1

2nd year
- Units
  - Machine Tools and Processes 2
  - Materials and Heat Treatment 2
  - Applied Mechanics 2 1
  - Gauge Drafting 1
  - Jig and Tool Drafting 4

3rd year
- Units
  - Jig and fixture
  - Jig and Fix. Drafting and Design 1 4
  - Metal Cutting 1 2
  - Advanced Machine Tools 2
  - Press tools
  - Press Tool Drafting and Design 1 6
  - Die Drafting 2
  - Moulding tools
  - Moulding Drafting and Design 1 4
  - Die-casting and Forging 4

4th year
- Units
  - Jig and Fix. Drafting and Design 2 and Metal Cutting 2 4
  - Press Tool Drafting and Design 2 and Special Processes 4
  - Moulding Drafting and Design 2 4

Total course — 30 units

836216 Higher Technician Certificate — Production (Quality Control)

Career potential

This course is unique to Swinburne Technical College.

In our highly technical and scientific world, just about everything we come in contact with in our everyday life is manufactured to a specified level of acceptance, whether it is on a 'one-off', batch or an assembly line basis.

The work of the quality controller is to ascertain that the manufacturing process is controlled to such an extent that the goods produced have reached a suitable degree of accuracy or acceptance; thus maintaining the levels of interchangeability, quality and safety, so vital to our manufacturing industries.

The far-reaching effect of tasks performed by quality controllers:

(a) protects the consumer against the purchase of faulty manufactured goods,

(b) maintains and promotes the company’s image and reputation.

The field of application of quality control techniques can be as varied as from the clothing industry to the manufacture of car tyres; from infinitely precise measuring equipment to huge crushing machines.

Career opportunities are equally as varied.

Entrance requirements

The standard entrance requirements for admission to the course are —

(a) Satisfactory completion of a year eleven course, including passes in English, Mathematics, Science and Technical Drawing/Engineering Graphics, to a standard approved by the College.

(b) Experience and maturity sufficient to undertake the course and to be employed in some function of quality control.

Prospective students who do not fit exactly into category (a) as shown should not be deterred from applying as the course is designed to enable students from the various fields involved in quality control to complete the certificate.

Course structure

First year
- Hours
  - TF120 Mathematics 1A and 1B 2
  - TF160 Physics 1A and 1B 2
  - TH115 Communication 2
  - TF218 *Metrology 1T 2
  - TF215 *Machine Shop Practice 3A and 3B 4
  - TF359 *Jig and Tool Drafting 1T 2

Second year
- Hours
  - TM220 Mathematics 2A and 2B 2
  - TF439 Method Study 2
  - TF417 *Production Processes and Development 1 3
  - TF230 *Materials and Processes 1A 3

  (for semester 1)
  - TF216 *Machine Shop Practice 4A and 4B 4

Third year
- Hours
  - TF321 Metrology and Inspection 1A and 1B 3
  - TF338 Instrumentation H (Production) 3
  - TF331 Mechanical Properties 2

Fourth year
- Hours
  - TF461 Organisation and Management of Inspection 1A and 1B 3
  - TF421 Statistical Analysis 1A and 1B
    plus one approved elective 4

  Electives
  - TF440 Production Control 1A and 1B 2
  - TF441 Computer Applications 1A and 1B 2
  - TF442 Reliability 1A and 1B 2
  - TF443 Electronic and Electrical Inspection 1A and 1B 2

*As this course has been designed basically for quality control in metal working industries, suitable in-service training in non-metal working industries may be appropriate alternatives for the subjects marked.

The acceptance of possible alternatives is at the direction of the college and, as a guide to prospective students, the policy is of a flexible nature, rather than an attempt to draw well-defined alternatives, which may benefit only a few.
Post-trade courses

83670E Certificate of Toolmaking — Post-apprenticeship

Career potential
Students who have already completed an apprenticeship course will develop a higher level of ability in the theoretical and practical side of tool and gauge room and developmental work which will enable them to enter more highly skilled and lucrative positions such as foremen and leading hands in a very wide variety of manufacturing industries.

This tool and gaugemaking course is of three years' duration and available both day and evening i.e. one half-day or two evenings per week.

Prerequisites
Completion of a fitting and machining apprenticeship course in the basic 20 modules, plus four alternative modules from certain streams (G, H and I).

Course structure
Area of Study
1st year
TF501 Toolmaking Theory 1
TF502 Toolmaking Practice 1
Unit 1
Principal and basic applications
Precision turning
Precision boring
Vertical spindle milling
Precision grinding
Unit 2
Associated studies, measurement and calculations
Micrometers and indicators
Vernier instruments
Application of toolmaking formulae
Trigonometry
Gauge blocks
Measurement of angles
Straightness and squareness testing
Measurement by optical projection
Unit 3
Workshop and laboratory activities
Turning operations
Positioning of holes
Milling operations
Grinding operations
2nd year
TF503 Toolmaking Theory 2
TF504 Toolmaking Practice 2
Unit 1
Relief turning
Jig boring
Thread grinding
Form tools
Milled type cutters
Lapping
Precision grinding
Unit 2
Calculations
Thread measurement
Surface finish
Measurement of taper and form gauges
Special courses

83660B  Electric and Oxygen-Acetylene Welding — Post-trade

General
The courses have been designed to meet the increasing demand for general instruction in welding processes.

All courses cover both theory and practice.
To complete a course successfully, a student must obtain a pass in all grades of theory and practice and obtain at least 50 per cent of the marks allotted for each grade of welding.

Entrance requirements
There are no prerequisite qualifications for these courses. However, preference will be given to those students who are seeking welding qualifications in connection with their employment.

Certificates
The Victorian Department of Labour and Industry may grant Government Welding Certificates in accordance with Australian Standard 1796-1975, to applicants who have obtained a minimum of 60 per cent of marks for both Theory and Practice in Grade III Electric Welding or Oxy-acetylene Welding examinations. Documentary evidence, satisfactory to the examining authority, of acceptable training and/or industrial experience is necessary.

Course structure
Each course consists of three years part-time study. Both courses are run separately. Time allocations for both theory and practice in each course are identical.

Subject Hours

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF710 Electric Welding Theory 1</td>
<td>2</td>
</tr>
<tr>
<td>TF711 Electric Welding Practice 1</td>
<td>4</td>
</tr>
<tr>
<td>TF810 Electric Welding Theory 2</td>
<td>2</td>
</tr>
<tr>
<td>TF811 Electric Welding Practice 2</td>
<td>4</td>
</tr>
<tr>
<td>TF910 Electric Welding Theory 3</td>
<td>2</td>
</tr>
<tr>
<td>TF911 Electric Welding Practice 3</td>
<td>4</td>
</tr>
<tr>
<td>TF720 Oxy-acetylene Welding Theory 1</td>
<td>2</td>
</tr>
<tr>
<td>TF721 Oxy-acetylene Welding Practice 1</td>
<td>4</td>
</tr>
<tr>
<td>TF820 Oxy-acetylene Welding Theory 2</td>
<td>2</td>
</tr>
<tr>
<td>TF821 Oxy-acetylene Welding Practice 2</td>
<td>4</td>
</tr>
<tr>
<td>TF920 Oxy-acetylene Welding Theory 3</td>
<td>2</td>
</tr>
<tr>
<td>TF921 Oxy-acetylene Welding Practice 3</td>
<td>4</td>
</tr>
</tbody>
</table>

Electric Welding (Special Course)
A short course to enable qualified tradesmen to improve knowledge and skills in order to pass special government welding examinations.
TF415 Electric Welding Special

TF708  Introduction to Welding
A semester course designed to introduce tradesmen and others, working in allied trades to welding skills and to facilitate their entry into general welding courses.

83602R  Fitting and Machining — Other than Apprentices

Career potential
This is an evening course in basic machine shop practice to provide engineering draftsmen and others working in allied trades an opportunity to study subjects parallel with those covered during apprenticeship.
The course is undertaken on a part-time basis of at least five hours per week. Students proceed at their own pace to complete the nineteen basic modules and the module 20 craft examination and four alternative modules.

Prerequisite
Applicants should have some work association with the fitting and machining trade and a genuine desire to become a skilled fitter and machinist.

Course structure
Modules 1-24.
Engineering subject details

Air-conditioning 1T (TF348)
The study of air, temperature, humidity, the gas laws and how to use them. Change of state from liquid to vapour, superheated steam vapours and the use of steam tables. Psychrometry covering humidity, dew point, wet and dry bulb temperatures and measurement of air conditions and instruments used.

Air-conditioning 2T (TF448)
Methods of reducing noise and vibration from equipment and pipe work. Air-conditioning systems and arrangement of equipment. Duct design, external and internal heat loads. Moisture transfer. Air-cooling and spray equipment.

Applied Electricity 1H (TE10)
This course provides the fundamentals for subsequent studies in the certificate courses of Electrical Design Drafting and Electrical Power. The main areas of study are electrical fundamentals, network analysis, magnetism, instruments and measurements, electromagnetism, electrostatics, EMF sources and AC fundamentals.

Applied Electricity 2H (TE210)
Topics include AC fundamentals, complex notation, network theorems, resonance, circuit Q, polyphase systems, circuit transients, complex wave forms and harmonic analysis, AC meters.

Applied Heat 1T & 1A & 1B (TF329)
Emphasis is placed on the qualitative development of the following topics:
Temperature measurement and control, heat and heat transfer, behaviour of gases, properties of steam, boilers and turbines, combustion, IC engines, air compressors.

Applied Heat 2T & 2A & 2B (TF430 & TF427)
Extension of Applied Heat 1H. Steady flow energy equation, power cycles, boiler plant, condensers, turbines, refrigeration, combustion, heat transfer.

Applied Mechanics and Applied Mechanics 1 (TB438 & TB425)

Applied Mechanics 1A & 1B (TF121)

Applied Mechanics 2A & 2B (TF221)

Applied Mechanics 3A & 3B (TF328)

Behavioural Studies 1A and 1B (TS215, 216)
Becoming aware of one’s potentialities, interpersonal relationships, uses and application of psychology, sociology and psychology, limitations in handling certain situations and problems.

Boilermaking

Module 1 (TF601)

Module 2 (TF602)

Module 3 (TF603)
Electric welding machines and generators, accessories, etc. SAA codes. Gases used in the trade. Trade materials, identification, application. LC steel plates and sections, sizes, calculations of mass for fabricated units. Marking-out and fitting. Manufacture of small tools.

Module 4 (TF604)

Module 5 (TF605)
Distortion in welds. Causes, factors, correction methods. Fabrication procedures for rectangular containers, cylindrical storage tanks. Assembly, material requirements, roof construction. Planning, design and fabrication of selected models and projects. Fabrication of unequal diameter pipes and branches.

Module 6 (TF606)
Defects in welds. Fabrication procedures for trusses and roof members as applied to structural members. Related trade mathematics. Fabrication procedures for pipe lines AS and 90°. Electric welding techniques and exercises. Fabrication of small tools. Welding of single and multipass fillet welds.

Module 7 (TF607)

Module 8 (TF608)

Module 9 (TF609)

Module 10 (TF610)
Filler rods and fluxes, types, indentification, applications. Fusion welding and brazing, plate and tube,
Circuit Theory

Module 11 (TF611)

Module 12 (TF612)

Module 13 (TF613)

Module 14 (TF614)
Arc welding processes, submerged arc, TIG, MIG resistance welding processes. Electric welding techniques, fillet welds, butt welds, pipe, rolled steel sections, round/round, angle/channel, joint preparations. Demonstrations of arc welding processes as outlined above. Demonstration and practice in allied gas cutting processes, stack, powder, heating, lancing, underwater, flame cleaning.

Module 15 (TF615)
Plane geometrical constructions. Plotting of cambers, PCD determinations, stud holes. Exercises involving the development of flat and curved. Regular revision of true length lines. Exercises to include tapered square and rectangular hollow units. Dihedral angles. Transition pieces, cylindrical offflakes, segmented bends. Right conical pieces. Intersections of right and oblique cones and cylinders. Spheres and hemispheres.

Module 16 (TF616)
Print reading and technical sketching, exercises in reading of drawings, use of freehand sketches, dimensioning, use of welding symbols. Compiling of material lists. All types and varieties of rolled steel sections to be incorporated in drawing exercises.

Circuit Theory 2H (TE19)
A course of study in AC fundamentals. Topics include — basic AC fundamentals, series circuits, parallel circuits, resonance, AC network analysis, power transformers, polypehase systems, rotating machines and instruments.

Communication (TH15)
The examination of methods of collecting, organising, evaluating and presenting factual information. Oral presentations, report writing, letters, memos and media analysis.

Computer Applications 1A and 1B (TA4411) and (TF441)
The aim is to interpret data from printouts. Topics: fundamental rules in using COBOL and FORTRAN, program development. Application: sales, production control, stock control etc.

Computer Techniques 1A and 1B (TF353)
A basic course in microprocessors considering hardware and software organisation. The areas covered are — organisation of computers, memory types, memory organisation, MPU, operation of MPU with memory, addressing modes, instruction set, binary arithmetic, condition code register, programming techniques, minimal systems, interrupts, the stack, sub-routines, PLA, ACIA, timing, DMA, programming aids, diagnostics.

Control Systems TH (Power) (TE423)
A basic introduction to the concepts of control system theory and practice in electrical technology. Development of analytical techniques necessary for maintenance and minor design procedures of power control systems.

Data Processing 1 (TS120)
Modern data processing techniques, problems that exist in the operation of business systems; types of business equipment manual, semi-automated, and fully automated.

Digital and Logic Control 1H (TE422)
Number systems, truth functions, Boolean algebra, minimisation of Boolean functions, tabular minimisation and multiple — output circuits, codes, sequential logic circuits, pulse — mode circuits, fundamental mode sequential circuits integrated circuits logic applications.

DRAFTING PRACTICE 1T (TF358)
Geometric constructions relative to the interpenetration of pipes, and ducting. Construction of involutes, cycloids and loci of points of mechanisms. Detail drafting relative to dies, forgings and fabricated parts.

DRAFTING PRACTICE 2T (TF456)

Electric Motor-Control 1 (TE150)

Electric Motor-Control 2 (TE250)

Electric Motor Control 1T (TE150)
Compensators for control circuits, control circuits, timing circuits, motor starters, speed controls, protective devices, circuit design.

Electric Motor Control 2T (TE250)
Electro-pneumatics, electro-mechanical devices, crane controls, conveyor systems, generating plants, basic electronics.
Electrical Apparatus & Circuits (TE324)
Electrical components, DC and AC motor starters, automatic starters, Speed control of motors, rectification, alarm systems, generating systems.

Electrical Contracting and Estimating (TE501)

Electrical Design 1 (TE360)
Electrical contracting, electrical installations, lighting, electric motor selection, protection and control; estimating, projects.

Electrical Design 2H (TE460)
Elements of electrical design, conductors, insulation, magnetic circuits, elements of circuitry and systems.

Electrical Drafting 1T (TE227)
Standard symbols, switchboard layouts, electrical control gear, electric motors, dimensioning procedures.

Electrical Drafting 2T (TE325)
Pictorial sketching, circuit drawings (electrical and electronic), structures, installations, office practices.

Electrical Drafting 3T (TE425)
Advanced electrical and electronic circuit drawing, protective circuits, switchboard layouts, Industrial installations, distribution.

Electrical Drafting 1H (TE133)
The aim of the course is to provide an appreciation of drafting convention used in mechanical, electrical and civil engineering and to develop an ability to interpret drawings and extract information from them.

Electrical Drafting 2H (TE133)
Types of electrical diagrams and drawings, electrical drafting symbols, presentation of circuit diagrams, drawing office practices, typical electrical drawings.

Electrical Drafting Principles 2H (TE240)
In general, the syllabus follows that set down for Electrical Drafting 2H; however, it is not intended that either the same quantity or quality of drafting would be achieved by students doing this subject.

Electrical Machines 1H (TE310)
Topics include machine operational principles, rotating machines, windings currents and EMFs, transformers, three-phase induction machines — starting, speed control, braking, single-phase motors, synchronous machines.

Electrical Measurements (TE419)
This subject is intended to provide the student with fundamental knowledge regarding the principles of electrical measurements and of the instruments used and their limitations and accuracy. Topics include standards, errors, analogue meters, digital meters, waveform errors, resistance measurement, AC bridge measurements, interference and screening, temperature measurements, inductance and capacitance measurement, cathode ray oscilloscope, magnetic measurements, instrument transformers, power circuit measurements, oscillographs, instrument selection and specification.

Electrical Mechanics

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>28</td>
<td>(TE028) Elec. Wiring Prac. 4</td>
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Electronic Fundamentals (TE170)
Safety principles, revision of electronic calculations, materials, registers, multimeters, AC and DC power, capacitors, inductors, transformers, semi-conductor principles, semi-conductor diodes, rectification and power supplies, multi-meters, cathode ray oscilloscope.

Electronics A (TE150)
Electronics B (TE161)
(See Industrial Electronics 1T)

A course designed to present an overview of modern electronics practice with emphasis on developing proficiency in measuring techniques and the basic understanding and limitations of test equipment.
Electronics 2H (TE223)
Introductory course dealing with the following topics — diode and zener diode applications, biasing and mid-frequency analysis of bipolar transistor amplifiers, field effect transistor amplifiers and vacuum tube amplifiers.

Electronics 2H (Power) (TE224)
This subject will introduce the student to the characteristics and functions of basic electronic devices — transistors fet’s and valves in basic amplifier circuits, operational amplifiers, thyristors (S.C.R.), rectifiers, logic circuits, wave shaping circuits.

Electronics 3H (TE323)
Classification of amplifiers, feedback amplifiers, operational amplifiers, direct coupled amplifiers, differential amplifiers, frequency response of amplifiers, active filters, power amplifiers, harmonic distortion analysis in amplifiers, power and heat dissipation in amplifiers. Rectification and power supply specification.

Electronics 3H (Power) (TE340)
A course designed for those students specialising in electrical power to gain an understanding in modern electronics practice also. Topics include — power supplies, operational amplifiers, power amplifiers, DC amplifiers, amplifier testing and performance oscillators, thyristors and their application, triggering devices and circuits, timers.

Engineering Practices 1A and 1B (TF308)
This three hour per week, single year subject is a limited but very practical introduction to some of the various aspects of plant and manufacturing engineering. The subject is broken up into 12 hours welding practice, 12 hours surveying practice, and the remainder in the workshop of projects using the lathe, drilling and milling machines, and the shaper or slotter, as well as some initial elementary fitting work.

English 1T (TH140)
Development of ability to read with comprehension and appreciation. Practice in oral and written English. Preparation of clear, concise notes and summaries.

English 2T (TH240)

Ergonomics
This syllabus is concerned with giving students a basic understanding of ergonomics and how it may be applied to all walks of life, to improve overall efficiency, reduce fatigue and to reduce the incidence of accidents. Although this subject will be biased towards production engineering, examples of domestic situations will also be used to stress the wide application of ergonomics.

Fitting and Machining (Apprentices)
Module 1
Module 2
Lathe work. Safety. Operational planning.
Module 3
Module 4
Turning operations. Cutting fluids. Equipment used for setting up. Science and materials.
Module 5
Fitting and Machining — Alternative Modules

General Fitting A51/A52/A53 (Industrial Hydraulics)

- Basic principles of hydraulics, a simple hydraulic system, pumps, directional control valves, actuators, pressure control, filters, seals, pipe lines, trouble-shooting, speed control, reservoirs, miscellaneous components, hydraulic liquids, transmissions, servo mechanisms and trouble-shooting of systems.
- Gas laws, basic principles, a basic system, actuators, directional control valves, air service units, speed control, compressors. Miscellaneous components, air lines, moisture control, circuits, seals, air motors, maintenance, standards, air gauging units and air lubrication of bearings.

Welding B51/B52/B53/B54 (Oxy-acetylene)

- Oxy-acetylene process, personal aspects, care of equipment, safety, pre-weld preparation, welding techniques, hard surfacing, welding of mild steel, welding of thermoplastics, heat treatments, identification of metals, fusion welding of cast irons, bronze weldings, welding of aluminium.

Welding B55/B56/B58 (Electric arc welding)

- Electric arc process, safety, care of equipment, welding procedures, power sources, electrodes, fillet welding, types of welded joints. Faults, effects of heat, iron and steel welding, heat treatment resistance welding, weld testing, pre-heating and post-heating procedures.

Gear Cutting F51, F52, F53, F54


Tool and Gaugemaking H51, H52, H53, H54

- Precision measurement — standards of accuracy, sources of error in workshop measurement, direct versus comparative measurement, gauging, measuring instruments, measuring with precision instruments. Helical milling, tool and cutter grinding. Explanations of toolroom functions, press tool-making, die-making for plastic and die casting, tool and gaugemaking.

Construction Equipment C51/C52/C53 (Industrial Hydraulics)

- Basic principles of hydraulics, a simple hydraulic system, pumps, directional control valves, actuators, pressure control, filters, seals, pipe lines, trouble-shooting, speed control, reservoirs, miscellaneous components, hydraulic liquids, transmissions, servo mechanisms and trouble shooting of systems.

Construction Equipment C54 (Industrial Pneumatics)

- Compressors, miscellaneous components, air lines, moisture control, circuits, seals, air motors, maintenance, standards, air gauging units and air lubrication of bearings.

Fitting and Machining (Other than Apprentices)

Module 1


Module 3

- Theory and practice. Files and filing, chisels and chipping, screw threads, drills and drilling, turning operations, equipment used for setting up and holding plain work on machines, cutting fluids.

Module 5

- Theory and practice: Files and filing, drills and drilling, turning operations, the shaping machine, machine cutting tools.

Module 7

- Theory and practice. Files and filing, drilling, grinding practice, simple screw cutting, the slotting machine and planing machine.

Module 9


Module 11

- Theory and practice: Single start vee and square threads, form turning, turret and capstan lathe.

Module 13

- Theory and practice. Accurate fitting and maintenance of pumps, clutches and bearings, checking a lathe for accuracy, marking out, scrapers and scraping, lubricants.

Module 15

- Theory and practice. Milling operations, the milling machine indexing, tooth forms of milling cutters.

Module 17


Module 19

- Theory and practice. Precision cylindrical grinding, surface grinding.

Module 20

- Theoretical and practical revision of modules 1-19 inclusive. Theoretical (3 hours) and practical examination (five hours) of work covered in modules 1-19.

Modules 21-24 inclusive

Four (4) alternative modules to be chosen from the following areas:


Fluid Power 1T (TF379)

- The emphasis of this course is on the basic scientific principles that describe the behaviour of hydraulic and pneumatic components. Explanation and description of actual equipment performance is at the core of this course.

Fluid Power 2T (TF477)

- Knowledge of hydraulic and pneumatic components is assumed. Emphasis of this course is on the analysis and design of power and logic circuits.

Foundations 1A and 1B (TB408)

Heat Treatment TF414 (special course)

Practical heat treatment involving selection of tool and die steels, carburising steels. Furnaces and furnace equipment. Temperature measurement and recording, quenchants, quenching methods. Heat treatment, operations of annealing, normalising, hardening and tempering, isothermal treatments, surface hardening treatments including carburising, carbonitriding, nitriding and induction heating. Metallography preparation of specimens, micro-examination of both unheat-treated and heat-treated steels. Hardness testing, mechanical testing of steels.

Industrial Electronics 1T (TE326).

Resistors, Capacitors, Inductors, Transformers. AC and DC circuits, Populating growth, the o. Electron theory. Emission.


Industrial Electronics 2T (TE412)


Industrial Electronics 3T (General) (TE413)


Industrial Electronics 3T (digital control) (TE415)


Industry and Society (TS128)

The work ethic and the nature of work, the social responsibility for employers, growth of industrial enterprises and economic growth, primary, secondary and tertiary industry, consumerism, pricing, trade unions/employer organisation, consumer growth, the o. Electron theory. Emission.

Instrumentation I (TE338)

Extension of metrology and machine tools, where principles, construction, calibration and evaluation of more common instrumentation procedures are developed. Emphasis is placed on functional test of electronic equipment. Pneumatic circuit elements. Measurement of basic qualities, measuring circuits, read-out systems, automatic control, equipment evaluation, non-destructive testing methods.

Instrumentation 1T (TF339)

Extension of metrology and machining tools, where principles, construction, calibration and evaluation of more common instrumentation procedures are developed. Emphasis is placed on functional test of electronic equipment. Pneumatic circuit elements. Measurement of basic qualities, measuring circuits, read-out systems, automatic control, equipment evaluation, non-destructive testing methods.

Introduction to Business Service Organisations (TS129)

What is business? What does it do? Forms of ownership, non-profit organisations, international organisation structure, functions of management, personal skills of managers, policy decision-making and documentation, general management tasks, basic business functions — financing, purchasing, staffing production, sales and marketing; operating techniques and controls of above.

Introduction to Economics 1A and 1B (TS238, TS239)

Understanding of meaning and scope of economics, what to produce, how to produce, who shall produce, supply price. Understanding of the Australian economy at work.

Introduction to Law 1A (TS243)

Semester unit. Origins and operation of law in Australia. Use of law in personal, civic and business affairs; complexity of law.

Introduction to Law 1B (TS244)

Continued study of law, knowing when professional aid should be sought, legal position to employees, property and public, legal aspects of different types of business ownership. Jig and Tool Drafting 1T (TF359)

The design and drawing of simple drilling, boring, turning and milling, jigs and fixtures, together with basic design techniques of clamping and location, cover this introductory subject. All drawings are prepared on A2 tracing paper and are drawn to AS1100 drawing standard.

Jig and Tool Drafting 2T (TF459)


Jig and Tool Drafting 2H (TF260)

This subject covers basic jig and tool drawing and design procedures, but concentrates more on the design of cutting tools and gauges and gauging principles. Mechanical elements such as brakes and pneumatics as applied to tooling are also covered. Drawings and sketches are prepared on tracing paper and are drawn to AS1100 drawing standard.

Leaving Technical Drawing A (metal trade technicians) (TF126)

Students usually study Leaving Drawing A. A pass in Fitting and Machining Trade Drawing 2 may be acceptable for certain courses. Projection, arrangement and detail drawings. Methods of fastening, transmission. Dimensioning. Introduction to structural steel framework.

Machine Shop Practice 3A and 3B (TF115)

Multi-start threads, machine grinding, milling, jigs and fixtures.

Machine Shop Practice 4A and 4B (TF216)

Gearing, advanced machining.

Machines and Mechanisms 1A and 1B (TF416)

The subject provides revision of basic applied mechanics and covers gearing (including epicyclic, helical, hypoid and worm applications), couplings, static and dynamic balancing of reciprocating masses, chain drive design, vibrations in machine design, variable speed drives, differential drives and a number of miscellaneous mechanisms.

All topics are covered using practical examples and suitable excursions when applicable.

Materials and Processes 1A (TF230)


Materials and Processes 2A (TF330)

Corrosion and its prevention. Stress corrosion, pitting corrosion, their influence on properties. Designing against corrosion. Surface hardening — carburising and nitriding method. Flame and induction hardening. Shot peening and

Mathematics 1A and 1B (H/T): TM120
Five hours per week, daytime for one semester or two hours per week, evening for two semesters. Assessment consists of class work (30%) and a final examination (70%). This unit deals with the following areas of mathematics: equations and formulae, relations and functions, trigonometry and an introduction to calculus. It is designed as a preparatory mathematics course leading to the mathematics 2H unit.

References

Mathematics 2H (TM220)
Full-time, five hours per week, daytime for one semester. Part-time, two hours per week daytime or evening, for two semesters. Prerequisites: TM120 Mathematics 1H. Assessment consists of one to two examination papers for qualifying students. The subject consists of the following topics for which assignments must be completed. Trigonometry; differentiation from first principles; techniques of differentiation; equation of tangents and normals; graphs of polynomial functions; integration and antidifferentiation; antidifferentiation; complex numbers; small increments and approximations; calculus and rates; mean and root mean square; work; volume of revolution; differential equations; optimisation theory; centre of mass, centroids and second moments of area; parallel and perpendicular axis theorem, centre of pressure. Revision tests are also included throughout the year.

References
No set text is required. Booklets covering the subject are supplied. The following texts are recommended for background reading.

Mathematics 1T (TM130)
Two hours per week daytime or evening, full year. Prerequisites. Year 10 mathematics or equivalent and adult entry. Assessment. Periodic tests and assignments and a final three-hour examination in November. This course teaches basic mathematics of algebra and trigonometry and assumes very limited pre-entry knowledge of those areas. Topics covered are fundamental operation of arithmetic and algebra, transpositions, graphs, trigonometry, factorisation, solution equations both linear and quadratic and logarithms.

References
Supplied notes.
Students enrolled in TM130 usually study Science 1T (TM170) also: these two subjects are time-tabled in a four-hour block.

Mathematics 2T (TM230)
Two hours per week, evening over two semesters. Prerequisites. Mathematics 1T, adult entry, or qualifications deemed equivalent by the Mathematics/Science Head of Department. Assessment; class work (40%) and one final examination (60%). An extension of Mathematics 1T, the topics include: review of basic algebra, advanced units in algebra, graphs of special functions, analysis of experimental data, advanced units in trigonometry, arithmetic and geometric progressions, statistics.

References
Supplied notes; Students enrolled in TM230 usually study Science 2T (TM270) concurrently, the two subjects being time-tabled in a four-hour block.

Mathematics 1E (TM123)
Full-time. Five hours per week (day) over 1 semester. Part-time, two hours per week, (day) over 2 semesters. Prerequisites. Completion of year 11. Assessment consists of two parts
1 Topic tests, one on each topic, contributing to 30% of the final mark.
2 One three-hour exam held in mid-June (or in November) contributing to 70% of the final mark.

Mathematics 1E is a subject service for a number of certificates and qualifications offered. Topics covered are: numbers and the number line, equations and formulae, relations and functions, trigonometry and applications, number systems, complex numbers, Boolean algebra.

References
Supplied notes.
A scientific calculator is also required.

Mathematics 2E (TM223)
Five hours per week over one semester or two hours per week over 2 semesters, both day and evening. Prerequisites: Mathematics 1E, or qualifications deemed equivalent by the Mathematics/Science Head of Department. Assessment. Classwork (30%) and one final examination (70%). An extension of Mathematics 1E (TM123) the topics include complex numbers, limits, differentiation and applications, integration and applications, differential equations, Boolean algebra.

References
Supplied notes.

Mathematics 3H (TM320)
Three hours per week day or evening over two semesters.
Prerequisites. Mathematics 2E or qualifications deemed equivalent by the Mathematics/Science Head of Department. Assessment. Computer assignments (20%), class work in Applied Mathematics (30%), and one final examination (50%). The final stage in mathematics for the COT (Electronics), subject consists of: review of complex numbers, hyperbolic functions, review of differentiation, partial differentiation and applications, review and extension of integration with applications, differential equations, sequences and series, Fourier analysis, Laplace transforms, computer programming, extension of Boolean algebra.

References
Mathematics 1P
Use of calculator, algebraic manipulation, solution of linear, quadratic and simultaneous equations. Logarithms and trigonometry. Calculation of perimeter, area and volume of standard and composite shapes.

Mechanical Design 1A and 1B (TF458)

Mechanical Design 2A, 2B, 2C, 2D (TF457)

Mechanical Properties H (TF331)
Fundamental tests — tensile (room and high temperature), impact (room and sub-zero temperature), compression, shear, torsion, fatigue creep, hardness and cupping. Verification of correct heat treatment. Typical defects and guide in critical survey of castings, forgings, extrusions, rolled products, weldments, plastics and other non-metallic materials. Testing for surface defects. Testing for internal defects. Preparation of work for testing methods employed and interpretation of results. Practical work involving mechanical testing and testing for surface defects, interpreting results.

Mechanical Drafting 1A and 1B (TF180)
This subject is concerned wholly with the development of basic theory and drafting skills relating to the elementary design and drawing of mechanical elements and mechanical power transmission equipment. Specific subjects include bearings, gears, limits and fits, fasteners, ‘V’ belt and chain drives etc. All drafting, comprising both sketching and formal drawing is done on tracing paper and is specifically oriented to industrial drawing office procedure using AS1100 drawing standard. (Leaving Drawing or equivalent is the necessary prerequisite.)

Mechanical Drafting 2AE and 2BE (TF259)
This drafting subject is similar in format and content to Mechanical Drafting 2AK and 2BK. Emphasis is placed on the practical development of assembly and detail drawings to AS1100 drawing standard. The drawings are prepared on A2 tracing paper and cover the field of practical design by drawing mechanical elements and equipment used for mechanical power transmission e.g. gears, couplings, splines, shafts, various types of bearings etc. This subject is assessed by an external drawing examination at the end of the second semester.

Mechanical Drafting 2AK and 2BK (TF258)
This is an continuation of the mechanical drafting subject and follows the same format as 1AK and 1BK, with the additional emphasis placed on drawing power transmission elements, such as gearbox, etc. Both Mechanical Drafting 1AK and 1BK and 2AK and 2BK form a combined two-year subject. This subject is internally assessed.

Mechanical Drafting (Production)
This subject is concerned wholly with the development of basic theory and drafting skills relating to elements used in Production Tooling Design. Specific subjects include, fasteners, springs, limits and fits bearings, both plain and rolling contact bearings, levers.

All drafting, comprising both sketching and formal drawing is done on tracing paper.

Mechanics 1T (TF319)
Vectors, rect-linear and angular motion, acceleration, inertia and momentum. Friction, work power and energy, machines, mechanical advantage, velocity ratio and efficiency. Behaviour of materials under load.

Mechanics 2T (TF419)
Statics, kinematics, dynamics, stress and strain, shells and joints, beams, torsion, hydrostatics and fluids in motion. Laboratory work.

Mechanics of Fluids and Fluid Machinery 1A and 1B (TF479)
The course of study offered introduces the students to basic fluid mechanics principles with the accent on user-oriented studies. The subject is run for three hours per week for the whole year. The syllabus outline is as follows — properties of fluids, perfect and real, hydrostatics of plane submerged surfaces, kinematics as flow visualisation, basic equations of continuity, energy and momentum, flow measurement methods, fixed and moving jets, general momentum theorem, flow in closed conduits, friction factor and other losses, dimensional analysis and similarity, rotodynamic machinery — pumps, fans, fluid coupling, and torque converters.

Metallurgy 1T (TF227)

Method Study (TF439)
History of work study, relationship of methods of study and work management. Benefits of work study to management and employers.

Field of application; procedure in making an investigation; methods of observation, methods study symbols, recording of information on charts. Uses and limitations of process charts, flow process charts, right and left hand charts. Principles of easy movement, workplace layout. Materials handling.

Necessity for work measurement; objectives of work measurements. Techniques for measuring work tasks.

Metrology and Inspection H (TF321)
A more theoretical approach to the fields of metrology and gauging. Emphasis is placed on equipment used, component identification reference to various current standards. Metrology 1T may be considered as a prerequisite.

Metrology 1A and 1B (TF318)

Metrology 2T (TF420)
Length metrology, measurement of angles, straightness and flatness. Optical measurement of screw-threads. Errors in measurement. Surface texture.

Organisation and Management of Inspection (TF461)
This subject deals with quality control through management.

Topics include:
Basic management concepts, sampling schemes, design and development tests and trials, legal obligation, safety, training methods.
Physics 1H (TM160)

Five hours per week (full-time) during the day for one semester or two hours per week (part-time) during the day or evening for two semesters.

Prerequisites. Students must have completed year 11 Physics. Assessment consists of assignments and tests for each individual core topic and assignment and test on one elective assignment and an elective test. This subject deals with a treatment of basic physical principles in topics which have been broken up into cores and electives. The core topics include, systems of units and dimension, vectors, kinematics, dynamic, work-power-energy-momentum and electrostatics. The electives include topics such as: Thermodynamics, electricity, statics, acoustics, fluid mechanics and electro-magnetism. Students are expected to complete each of the core units at a mastery level of 65%.

References

However if further reading is required the texts most suitable are those with the 'basic physics' titles or 'introduction to physics', provided they deal in SI units.

Physics 2H (TM260)

A course designed to introduce students to The methods and techniques of experimental physics and the operation and use of a wide variety of equipment.

It is mainly a practical course. The work is carried out in the fields of — optics, electrical circuits, electronics, electronic measuring equipment and photography. Other activities include student projects and visits to laboratory installations.

Process Heating (TP237)


Production Control H (1A and 1B) (TF440)

Designed to give an understanding of general management and financial controls. Topics include factory organisation, functional control, production control, psychology in industry. Industrial legislation.

Production Processes and Development (2A and 2B) (TF450)

A more theoretical approach to the machining of materials, forming processes, plastics, precision casting, modern processes: Laser beam machining, electron beam welding, numerical control of machine tools. Prerequisites are Trade Technician or Machine Shop 1H and 2H, Fitting and Machining 5 or Toolmaking 1 and Production Processes and Development 1T, H, or approved electives.

Production Processes and Development 1T (TF417)


Production Techniques 1A (TS150)

Appreciation of parts and functions which form production unit. Application of control and planning techniques to typical production problems.

Production Techniques 1B (TS151)

Continuation of 1A.

Production Techniques 2A and 2B (TS250 and TS251)

More sophisticated production management techniques, appreciation of organisational relationships, concept of production in an integrated system.

Properties of Electrical Materials 1A and 1B (TE228)


Properties of Materials (TE234)

Metallography, ferrous alloys, testing of metals, magnetic alloys, non-ferrous metals and alloys, non-metallic materials, joining of metals, processes applied to electrical apparatus, corrosion.

Pulse and Digital Electronics (TE320)

Introduction to pulse and digital techniques. Topics include compensated voltage dividers, low pass and high pass passive filters, clipping, clamping, transistor switching, pulse devices, mos devices, multivibrators, IC timers, comparators and monostable devices, multivibrators, IC timers, comparators and monostable devices, logic gates, logic families, flip flops, MSI and LSI devices, types of display.

Refrigeration 1T (TP439)

The theory of heating and cooling of liquids and vapours. The study of vapour compression cycle using ammonia. R12 and R22 refrigerants. Description of refrigeration equipment and different types of refrigerants. Sizing of refrigeration equipment.

Refrigeration 2T (TP449)

The study of compressors, volumetric efficiency, compressor losses, multi-stage compressors, flooded systems, capacity control, matching components in a VC system; absorption refrigeration and heat transfer. System faults in a simple VC system. Refrigeration piping design. Application of refrigeration for preservation of food and air-conditioning. Refrigeration and Air-Conditioning 1AM and 1BM (TF448)

The course of study provides the student with an appreciation of the principles and practice of refrigeration and air-conditioning. The course amounts to three hours per week for the whole year. The syllabus outlined is as follows — properties of refrigeration, analysis of the vapour compression cycle, some operating characteristics of the whole cycle, descriptive work in the principle components, description and reason for major auxiliary components, descriptive treatment of absorption systems, common fault diagnosis and correction, psychometric properties of the air-water mixture, psychometric processes, heat transfer processes related to building heating and cooling loads, methods of heating, cooling, humidification and dehumidification of spaces, air cleaning methods, ventilation requirements, duct sizing methods.

Reliability H (TF442)

Emphasis is placed on design experiments to ensure reliability. Topics include basic theory (statistics) fundamental concepts of reliability design development and manufacture for reliability. Data collection.

Science 1T (TM170)

Two hours per week, day or evening over two semesters. Prerequisites. Year 10 science or equivalent and adult entry. Assessment: periodic tests and assignments and a final three-hour examination in November. The course is aimed at teaching basic physics in S. I. units, vectors equilibrium, kinematics, Newton’s three laws of motions, work, power, and energy, heat, Ohm’s law, and basic electric circuits.

References

Supplied notes. Students enrolled in TM170 usually study Mathematics 1T (TM130) concurrently, the two subjects being time-tabled in a four-hour block.
Science 2T (TM270)
Two hours per week, evening over two semesters. Prerequisites: Science 2T, adult entry, or qualifications deemed equivalent by the Mathematics/Science Head of Department. Assessment. Class work (40%) and one final examination (60%).
An extension of Science 1T, the topics include: electricity and magnetism, advanced units in electric circuits, fluid statics, fluid dynamics, optics and wave motion, thermodynamics, notational kinematics, notational dynamics.

References
Supplied notes.
Students enrolled in TM270 usually study Mathematics (TM230) concurrently, the two subjects being time-tabled in a four-hour block.

Social Science 1H (TH180)
This subject aims at improving social awareness and cultivating inter-personal relationships. Experience is provided with analysing and solving problems in this area, developing facility and willingness to cope with social change. Learning is through group experience, dialogue, lectures and case studies.

Social Science 2H (TH280)
Attempts to understand the work environment in relation to human needs. Experience is provided with processes that lead to change in the individual and the work environment. Study is of how organisations operate and of the inter-relationship between employer and employee. Methods include visits to industry, syndicate activities, involvement in organisations and case studies.

Social Science 3H (TH380)
Concern is with the role of a supervisor. How does he relate basic knowledge of human behaviour to work relationships? Introduction to basic principles of supervision within organisations. Use is made of structured experiences, syndicate, lectures, simulations, role identification.

Statistical Analysis 1H (TF421)
Basic use of statistics in the field of process control. Topics include basic theory, process control variables and attributes, acceptance sampling, significance testing.

Structural Drafting 1A and 1B (TB195)
Usual prerequisite for this subject is a pass in Leaving Technical Drawing A. Course includes practical drafting and lectures on use of steel sections, splicing, connections, standard drawing practice. Structural terms, reinforced concrete, timber.

Structural Drafting 2A and 2B (TB295)
Usual prerequisite is a pass in Structural Drafting 1H. Project drafting work and necessary theory in structural features, external features, multi-storey buildings, concrete projects, detailing from an engineering specification.

Structural Mechanics 1A and 1B (TB197)
Review of statics, external forces acting on rigid bodies, principles of equilibrium, internal forces within rigid bodies. Load-deformation, characteristics of materials. Structural joints and connections, Laboratory work.

Structural Mechanics 2A and 2B (TB297)

Structural Practices 1A and 1B (TB196)
Designed to give an appreciation of surveying theory and practice and an introduction to the construction and structural consideration of industrial type buildings.

Structural Practices 2A and 2B (TB296)
Extends Structural Practices 1H and also includes industrial building roof design and multi-storey building construction.

Supervision (Electrical) (TE506)

Supervision 1H (1A and 1B) (TS431) (TS432)
The aims of the course are to enable the student
(a) to understand and apply basic principles of supervision within the structure of a business organisation.
(b) to gain a basic understanding of human behaviour and be able to apply this knowledge in a supervisor's position.

Toolmaking (Other than Apprentices)
TF501/2 First year Theory and Practice

TF503/4 Second year Theory and Practice

TF505/6 Third year Theory and Practice
applications in tool and gaugemaking, types of electrodes, electro-chemical machining, jig boring, assembly and inspection of components, tilting rotary table for single and compound angles, Block indexing, Precision cylindrical and surface grinding. Optical measuring methods, monochromatic light, polygons, auto collimator and alignment telescope.

Tooling and Inspection Methods (TF730)
Three important production engineering areas are covered in this subject. Metrology includes measurement. Jig and fixture design covers the basic principles of clamping and location and includes simple sketched designs of drilling, boring and milling jigs and fixtures. Quality control includes the use of statistics to achieve control through batch-sampling techniques and includes probability and sample control charts etc.

Trade Electronics Th. 1 (TE116) Pr. I (TE117) – see 'Industrial Electronics 1T'
Trade Electronics Th. 2 (TE216) Pr. 2 (TE217) – see 'Industrial Electronics 2T'
Trade Electronics Th. 3A (TE313) Pr. 3A (TE314) – see 'Industrial Electronics 3T' (General)'n
Trade Electronics Th. 3C (TE317) Pr. 3C (TE318) – see 'Industrial Electronics 3T (digital control)'

Welding — Oxygen and Acetylene
Electric Welding. Theory I (TF710)

Electric Welding Practice I (TF711)

Electric Welding Theory II (TF810)

Welding procedures: Methods, reasons for, effects of Introduction to mechanical testing, destructive and non-destructive methods. Heat treatment, types, effects, functions, applications. Fixtures and positioners, function, requirements, applications. Flame cutting and allied processes. Appreciation of other welding processes, TIG and MIG, resistance, submerged arc, electro-slag, etc. Welding costs, factors involved, examples.

Electric Welding Practice II (TF811)
Building up worn surfaces. Fillet welds; all welds to gauge size, using a wide selection of electrode types and sizes. Flat and H/V positions up to 12 mm, multiple pass. Vertical up and down, overhead, horizontal positions, up to 100 mm. Joining of RSS to CCS plate in vertical position, single and multiple pass.

Butt welds: Electrode requirements as for fillet welds. Prepared single and double V, flat, vertical up and down, horizontal. Prepared structural sections solid and hollow, flat position. Demonstrations of other welding processes e.g. TIG, MIG, resistance, submerged arc, etc. Operational experience on as many units as possible.

Electric Welding Theory III (TF910)
General knowledge of SAA codes relating to welding. Safety requirements, welding, cutting, general, personal and operational requirements related to various applications. Elementary first aid requirements.

Quality control, inspection and testing of welds, destructive and non-destructive methods, internal and external weld defects and methods of correction.

Alloy steels, corrosion, creep and heat resistant, clad, manganese and cast. Knowledge of composition, properties, weldability, and procedures. Cast iron, types, composition, properties, weldability, applications, welding requirements. Introduction to non-ferrous metals, common types, properties, applications, welding requirements.

Surfaceing, types of wear, electrodes, applications, techniques. The welding of pressure vessels and structures, appreciation, joint types, workmanship, testing as per code.

Outline of special welding processes, electron beam, laser, plasma, friction.

Electric Welding Practice III (TF911)
Fillet welds, all positions, full range of sizes and types, 6mm and smaller. Welding of 1.6mm LCS sheet. Butt welds, square and prepared, all positions 1.6mm and thicker sections. Pad welds. Corner, edge and lap welds. Test plates, preparation, welding, testing in accordance with SAA codes. Fillet and butt welds.

Preparation, setting up and welding of small structures and weldments. Demonstrations of welding and cutting of special steels, ferrous and non-ferrous, with as many processes as possible.

Oxygen-acetylene Welding Theory I (TF720)
General description, safety requirements, personal safety requirements, toxic fumes, hazardous areas. Care and control of plant and equipment. Gases used, properties, storage, use of flashback and backfire, causes. Manifold systems, operation, maintenance.

Definition of common terms.

Oxygen-acetylene Welding Practice I (TF721)
Setting up and operation of equipment. Care and control of equipment. Effects of various types of welding flames. Welding of 3mm LC steel. Forehand and backhand techniques, closed butt, corner, open butt, square, flat, vertical, horizontal.
Welding of 50mm pipe, fixed and rolled. Fillet welds up to 3mm thickness. Pad welds. Butt welds in 10, 12 and 25mm square sections. Fusion welding of grey cast iron. Brazed welding, LC steel and cast iron.

Oxygen-acetylene Welding Theory II (TF820)


Oxygen-acetylene Welding Practice II (TF821)
Prepared butt welds — 5mm plate, flat, vertical overhead and horizontal. Fusion welding of 1.6mm copper sheet. Bronze welding 1.6mm copper and brass sheet. Copper tube and spigot joint. Low temperature brazing. Welding of stainless steel, fusion, 1.6mm sheet. Hardsurfacing applications. Welding of 80mm pipe in vertical position. Repairs to castings, grey cast iron and aluminium. Practical demonstrations, thermoplastics, vapour-flux, powder cutting, welding of die-cutting materials, flame hardening, gouging, machine cutting with templates.

Oxygen-acetylene Welding Theory III (TF920)

Oxygen-acetylene Welding Practice III (TF921)
Fusion butt welds 1.6mm, 3mm, 5mm, 5mm and 6mm LC plate in all positions. Fusion butt welds in 1.6mm aluminium, flat, outside corner. Fusion welds, butt, copper, brass, silicon bronze, stainless steel 1.6mm flat position. Low temperature brazing, fillet and lap joints, stainless steel, copper and aluminium. Bronze welds, fillet lap butt joints, cast iron, restricted access butt joints.

Fusion welds, butt LC steel 80-100mm, nickel break and bend specimens. Fusion welds — 90° branch LC steel 80-100mm fixed and horizontal, visual and macro-inspection. Demonstrations of procedures and techniques when welding stainless steel and non-ferrous metals with TIG welding process.

Work Measurement 1A, 1B (TF182, TF183)

Work Measurement 2A, 2B (TF282, TF283)
Frequency studies. Interference to production. General data system. Statistical work sampling. Non-repetitive work measurement. Master clerical data. EPS resources contributing to capacity. Filing systems.

Work Measurement 3 (TF382)
Wage payment plans. Labour budgets and controls. Complete techniques project.

Work Methods Improvement 1A, 1B (TF184, TF185)

Work Methods Improvement 2A, 2B (TF284, TF285)

Work Methods Improvement 2C, 2D (TF286, TF287)

Work Study 1H (TF337)
— Staff .................................... TC66
— Courses ................................. TC66
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Subject details
— Tertiary Orientation Program .......... TC67
— Applied Science (Science Laboratory) TC70
General Studies Division

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G.A. Harrison, BSc, DipMechE, TTTC

Humanities Department

Head
R. M. Carmichael, BA, TSTC (Acting)

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Patricia Mitchell, BA(Hons), CertEd(Lond)
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D. Pike, BA, DiplEd
D. Plumb, BA, DiplEd
Anne M. Ryan, BA, ACTT
Mary Sharp, BA, DiplEd
K. Wiltshire, BA, STC

Mathematics and Science Department

Head
R. Gullan, BSc(Hons), MEd, MACE

Academic staff
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G. Booth, DiplChemEng, DiplEd
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G. A. Lisowski, PhD, DiplEd
R. Marar, MSc, MEd
J. D. Scott, BAppSc, TSTC
G. Tonkin, ARMIT, TTTC
B. Tyrer, BSc, DiplEd
A. Zammit, BAppSc, DiplEd

General studies courses

The following courses are offered by the General Studies Division:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Type of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>847405</td>
<td>General Studies (Humanities) — full-time</td>
<td></td>
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<tr>
<td>84741J</td>
<td>General Studies (Humanities) — part-time</td>
<td></td>
</tr>
<tr>
<td>848405</td>
<td>Science/Engineering — full-time</td>
<td></td>
</tr>
<tr>
<td>84841J</td>
<td>Science/Engineering — part-time</td>
<td></td>
</tr>
<tr>
<td>84820G</td>
<td>Certificate of Applied Science (Science Laboratory)</td>
<td></td>
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</tbody>
</table>

Tertiary Orientation Program

The Tertiary Orientation Program at Swinburne is designed to meet the needs of students who intend to proceed to tertiary education, in particular to the diploma and degree courses offered by the faculties of arts, art, applied science, business and engineering of Swinburne College of Technology.

The course offers a bridging program to tertiary education for a wide range of students. While the program is based on needs for secondary student transition to tertiary study, it also provides a most suitable preparation for tertiary study for more mature people.

The program is studied in a tertiary environment. First class educational facilities are available; these include library, audio-visual, computer, student amenities and counselling. Experienced teaching staff maintain a close liaison with college staff in the tertiary division.

Course structure

Seventeen subjects are offered. Students usually take five subjects and are required to pass a minimum of four including English, to meet tertiary entrance requirements. A restricted range of subjects is available for part-time day and evening students.

Students who intend to proceed to tertiary science and engineering courses are encouraged to take English, Chemistry, Physics, Mathematics and Concepts of Mathematics.

Before choosing subjects, students, especially part-time, are advised to check the entrance requirements for tertiary courses in which they may be interested.

Various assessment procedures are used. Assessment is regarded as a continuous function and is not based solely on performance in formal examination.

Subjects

- Accounting (TS009)
- Art (TH003)
- Biology (TM004)
- Chemistry (TM005)
- Concepts of Mathematics (TM027)
- Economics (TS008)
- English (TH010)
- History of Western Civilisation (TH015)
- Introduction to Modern Government (TH020)
- Introduction to Italian (TH050)
- Mathematics (Science) (TM026)
- Mathematics (General) (TM030)
- Media Studies (TH032)
- Physics (TM040)
- Study of Ideas — Philosophy (TH045)
- Themes in Australian History (TH001)
Tertiary Orientation Program

subject details

Accounting (TS009)
Full year accounting course for students with limited or no prior knowledge of book-keeping or accounting.
Topics covered include: basic concepts and terminology; the accounting equation; recording methods; balance day adjustments; final reports; accounting procedures for control; accounting for multiple ownership and analysis and interpretation of final reports.

An (TH003)
This subject, in the main is a problem solving course, broken into 2 areas of study:
(a) Theory
(b) Practical
Theory sessions are centered around lectures/tutorials incorporating some historical material and approaches to aesthetics, philosophical argument for 2 hours per week.
Practical sessions concentrate on printing, drawing, and elected media with emphasis on group discussion of completed material for 3 hours per week.

Biology (TM004)
The course investigates, in a practical way, what takes place within the individual organism — with the internal structure, physiology and biochemistry — and with the ways in which the characteristics of the organism are determined and passed from one generation to the next.

Chemistry (TM005)
Three hours of theory and two hours of laboratory work per week.

Prerequisite: Year 11 Chemistry.
Assessment: Tests, assignments, practical work and two major examinations, one at the end of each semester.
The syllabus covers stoichiometry, atomic structure, bonding, periodic classification, thermodynamics, chemical kinetics, chemical equilibria, redox reactions, electrochemistry, organic chemistry, polymer chemistry.

Concepts of Mathematics (TM027)
Four hours per week daytime only.
Prerequisite: Year 11 (Applied Science) standard mathematics.
Assessment consists of 7 topic tests requiring a mastery at the 75% level, a computer assignment, a test in an option topic and a final optional credit examination.

Economics (TS008)
The aim of this course is to introduce students to the economic aspects of human behaviour with emphasis upon the application of theories and principles to economic problems and social issues within the framework of the Australian economy. The underlying theme for this introductory course in economics is the impact of economic activity upon human welfare.
The course may be attempted by students who have not studied economics previously.

English (TH010)
A general course which requires the student to read widely, research topics and form judgements. Developing the skills of comprehending, thinking and writing, form the basis of the course. A wide range of written work is covered including essay, original writing and critical evaluation. Oral communication is emphasised, involving practice in short reports, discussions, debates and interviews. In addition students will be offered a wide choice of electives including extra study in basic English, media, drama, literature, and formation of social attitudes.

History of Western Civilisation (TH015)
A survey of major developments in western civilisation from ancient times to the present. Emphasis is on the study and methodology of history, including an introductory unit on the nature of history. The scope of the course is broad but special emphasis will be placed on the Ancient World (especially Greece and Rome) and Europe in the 19th and 20th centuries particularly the problems facing Western Civilisation this century.

Introduction to Italian (TH050)
This course provides students with an introduction to the Italian language using a study of Italian culture to acquire the basic skills of communicating. Through this technique students will be introduced to linguistic concepts which link the culture and civilisation of Italy to that of the Western world. A brief geographic and historical survey of Italy will conclude with a sociological perspective of the situation of Italian immigrants in Australia.

Introduction to Modern Government (TH020)
The course is designed to allow students to make a study of certain aspects of Australian politics. The emphasis are on political forces, procedures and machinery. Questioning of politics such as — its nature, elements and interaction, comparisons are made with the United States.
Mathematics (Science) (TM026)
Five hours per week for two semesters.
Prerequisite: a pass in Mathematics I and II at Year 11.
Assessment: unit tests, assignments and two major exams, one at the end of each semester.
The course is designed to cover the fundamental mathematical ideas and skills required by students intending to proceed into degree level science and engineering courses. The syllabus covers such areas as algebra, exponentials and logarithms, circular functions, curve sketching, differentiation, complex numbers, integral calculus, vectors, differential equation and kinematics.
References
Other printed notes.

Mathematics (General) (TM030)
Six hours per week, daytime or four hours per week, evening.
Prerequisite: a pass in Year 11 mathematics.
Assessment will be made on a continuous basis. The final grade obtained by each student is based upon performance in ten (approximately) compulsory topic tests plus two assignments. To achieve a credit level pass, students will also be assessed on a final three-hour examination based on the whole year's work.
The course covers fundamental mathematical ideas and skills needed by students who intend pursuing courses in business, social sciences and other tertiary courses such as physical education, nursing and physiotherapy. The syllabus includes sets, functions and relations, linear algebra, matrices, probability, statistics, sequences and series, calculus.
Reference

Media Studies (TH032)
Media Studies involves an introductory study of film, radio and television. The course takes a critical, historical and appreciative appraisal of film, television and radio, with a particular emphasis on these areas in Australia. Other aspects covered in detail are the language, effectiveness and impact of these media. There is a small component of practical film work in the course.

Physics (TM040)
Five hours per week, daytime or four hours per week, evening.
Prerequisite: a pass in Year 11 Physics, or equivalent.
Assessment consists of two end-of-semester examinations, laboratory work and tutorial assignments.
The course is centred around experimental work and three hours a week are spent in the laboratory. The main topics are: geometrical optics; mechanics of straight line, circular and simple harmonic motion; experimental analysis; electrostatics, electromagnetism and electric currents; light; atomic physics. A small project, which may be of a theoretical or practical nature, is usually undertaken towards the end of the year.
References

Study of Ideas (TH045)
There are two separate courses in the Study of Ideas. Students take one course or the other, not both.
Study of Ideas 1 — Introduction to Ideas of Philosophy
In this subject, questions about man are explored. People in society are studied; their rights, freedoms, responsibilities, what they think is 'fair'. Individual attitudes to life and death are explored, and the purpose to human existence.
Whether we are free beings, or whether our lives are determined. The possible values and life-styles there are from which to choose.
Study of Ideas 2 — Introduction to Ideas of Psychology
This is a humanistic study of behaviour. The focus is upon inner feelings and attitudes and how individuals see themselves and others. How can people change? The subject includes a study of theories and psychological models. Freud, Adler, Glasser, Maslow and Rogers explain human behaviour.

Themes in Australian History (TH001)
Covers the period 1750-1939. The topics are planned to explore developments in Australian history and whether they have persisted, changed or become myths. Students have the opportunity to do further research into topics of particular interest to them. Primary material is basic and wider reading encouraged.

Reading, Writing and Study Skills (TH070)
A return to study course with an emphasis on writing skill, efficient reading, comprehension and study skills. Individual assistance is the important ingredient for students new to study.

References
Certificate of Applied Science (Science Laboratory)

Career potential
Many diversified career prospects are available for students undertaking the course. Laboratory personnel may be classified as Technical Assistants, Laboratory Assistants, Laboratory Technicians and Technical Officers. Industrial, educational and governmental laboratories are seeking trained technical staff.

The purpose of this course is to produce graduates who, skilled in modern laboratory techniques and methods, are capable of providing immediate technical support to professional scientists, engineers and teachers.

This certificate course is designed to meet the needs of people who intend to make their career in a laboratory environment.

The course
The course is offered as part-time study, requiring usually, two evenings and one afternoon of attendance weekly over a period of four years. The first two years are common years, with students undertaking Physics, Chemistry, Mathematics and Communications. In the latter two years, students select from a wide range of subjects to meet their own interests or the demands of their work environment.

Generally students obtain a half-day release from their employers who, in return, gain benefit from their employee’s increased awareness and competence in modern technology.

Although the vast majority of students undertake the course on a part-time basis, a full-time study program for the earlier units, can be arranged for students experiencing difficult employment problems.

The training provided, deliberately encompasses a wide range of skills, techniques and processes (as shown in the course details), so that graduates can meet the increasing technological and administrative demands being placed upon them.

In some cases, students involved with this course have been able to further their knowledge by gaining entry to degree and diploma courses in applied science.

Entrance requirements
The usual requirement is that the students are employed in a laboratory and have completed a course of study at the fifth form level. A background of chemistry, mathematics and physics is recommended, but such knowledge will not be assumed.

Applicants with some years of laboratory work experience may, however, be admitted with less than full entry requirements if they can demonstrate their capacity to succeed in the course.

Course structure
Category 1 (Common units)

<table>
<thead>
<tr>
<th>First year</th>
<th>Units</th>
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<tbody>
<tr>
<td>TA108 Chemistry 1</td>
<td>1</td>
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<tr>
<td>TA109 Chemistry Laboratory Techniques 1</td>
<td>1</td>
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<tr>
<td>TA121 Physics 1S</td>
<td>1</td>
</tr>
<tr>
<td>TA122 Physics Laboratory Techniques 1</td>
<td>1</td>
</tr>
<tr>
<td>TA143 Computations</td>
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<table>
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<tr>
<th>Second year</th>
<th>Units</th>
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<tbody>
<tr>
<td>TA208 Chemistry 2S</td>
<td>1</td>
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</tbody>
</table>

| Category 2A (Technicians in industrial, college and governmental laboratories) |
|------------------------|--------|
| TA209 Chemistry Laboratory Techniques 2 | 1 |
| TA221 Physics 2S | 1 |
| TA222 Physics Laboratory Techniques 2 | 1 |
| TH115 Communication | 2 |

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<th>Units</th>
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TA144 Statistics
Plus a minimum of four Instrumental Technique units selected from the following:

| Category 2B (To be taken by school laboratory technicians) |
|--------------------------|--------|
| TA330 Biochemistry 1S | 2 |
| TA345 Principles of Organisation | 2 |
| TA331 Organic Chemistry 1 | 1 |
| TA332 Oil and Polymer Chemistry | 1 |
| TA452 Quality Control | 1 |
| TA459 Physics 3S | 2 |
| TA460 Microbiology 1S | 2 |
| TA450 Introduction to Electronics | 2 |
| TA453 Glassworking | 1 |
| TF230 Materials and Processes 1A | 1 |
| TA401 Biochemistry 2S | 2 |
| TA461 Microbiology 2S | 2 |
| TF330 Materials and Processes 2A | 1 |
| TA441 Computer Applications | 1 |
| TA251 *Bioclogy 2A | 1 |
| TA252 *Bioclogy 2B | 1 |
| TA305 *Educational Aid Techniques 1A | 1 |
| TA306 *Educational Aid Techniques 1B | 1 |
| TA307 *Educational Aid Techniques 1C | 1 |
| TA308 *Educational Aid Techniques 1D | 1 |
| TA310 *Laboratory Workshop Practice 2A | 1 |
| TA311 *Laboratory Workshop Practice 2B | 1 |
| TA470 HProject | 2 |

*These subjects are not recommended for Industrial Laboratory Technicians but will be offered for school Laboratory Technicians when demand warrants.

The project is carried out in the students' place of employment by special arrangement between the employer and the college staff.

Dates for enrolments
Students may enrol for the course during the last week of the previous year (i.e. mid-December), the first three weeks of February of each year and for semester 2 subjects in the last two weeks of June of each year.

Exemptions may be granted to students who have completed equivalent level studies i.e. HSC subjects or subjects offered by other technical colleges.

Entry to degree and diploma studies in Applied Science is possible after completion of this certificate course.

Further information
Course Co-ordinator, Miss J. Johnston 819 8805
General Studies Division Secretary, 819 8159

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848206
Applied Science (Science Laboratory) 
subject details

Biochemistry 1S (TA301) 
Three hours per week for two semesters. 
Assessment is based on assignments, unit tests and practical work. 
A study of conservation and dissipation of energy — types of biological compounds (properties and reactions) — metabolism — catabolic and anabolic — control and integration of metabolic pathways. Demonstrations of equipment — practical work. 
Reference 
Biochemistry 2S (TA401) 
Three hours per week for two semesters. 
Assessment: see teacher in charge. 
Reference 
See teacher in charge. 
Biology 1A (TA151) 
Three hours per week for one semester. 
Biological principles and materials. Awareness of the diversity of living organisms in nature and skills involved in handling of living materials. 
Reference 
Australian Academy of Science, Biological Science: Web of Life. Canberra, Australian Academy of Science, 1979 
Biology 1B (TA152) 
Three hours per week for one semester. 
Assessment: based on written segments submitted throughout the course. 
The course deals with supply and maintenance of a wide variety of organisms required for Secondary Science Programs. The principles of the physiological requirements of living organisms. 
Reference 
See teacher in charge. 
Chemistry 1 (TA108) 
Three hours per week for one semester. 
Assessment: based on assignments and unit tests throughout the course. 
References 
Other class notes. 
Chemistry 2S (TA208) 
Three hours per week for one semester. 
Assessment: Assignments and unit tests throughout the course. 
Includes, at post-HSC level, a study of dissociation, hydrolysis, oxidation and reduction. Introduction to gravimetric and volumetric analyses and elementary organic chemistry. 
References 
Chemistry Laboratory Techniques 1 (TA09) 
Assessment: written reports and laboratory techniques. 
Comprises a combination of lectures, demonstrations and laboratory experiments including handling and storage of chemicals, safety and first aid in laboratory, sampling, care of balances and glassware, analytical procedures. 
Reference 
Chemistry Laboratory Techniques 2 (TA209) 
Assessment: written reports and laboratory techniques. 
Involves safety rules, precautions and techniques involved in gravimetric and volumetric quantitative analyses. Identification of organic compounds. 
References 
Communication and Report Writing. IA and IB (TH115, TH116) 
Two hours per week for two semesters. 
Assessment: based on set tasks including class work and group participation. 
1A (TH115) Communication theory and its application to the collection, organisation and presentation of scientific information. Forms of task documentation: laboratory and project reports, memos and letters. Oral reports and presentations. 
1B (TH116) Research and presentation of analytical reports, job briefs and specifications. Group communications skills: meetings, discussions and interviews. Audio-visual techniques and presentations. 
References 
A class text and printed notes. 
Computations (TA143) 
Two hours per week — evening only, one semester. 
Assessment consists of six unit tests and two assignments. 
This unit begins with revision of basic whole number and decimal arithmetic, ratio, proportion and algebraic equations. This is followed by the study of formulae, scientific notation, indices, logarithms (including bases 10 and e), the use of calculators and flowcharts, basic trigonometric functions, the solution of right-angle triangles and trigonometric graphs. The graphs unit includes experimental techniques with practical data and including linear, semi-log and log paper, monograms, and the solution of graphs, using laboratory and industrial materials. 
References 
Computer Applications (TA441) 
Two hours per week for one semester. 
Assessment is by projects and programming assignments given throughout the course. 
The aim of this course is to provide an introduction to the use of computers in industry. Topics covered include progrann-
ming in BASIC, running packages, and familiarisation with large main frame computers as well as mini computers using batch and interactive techniques. Social implications of computers are also considered.

References
FACOM and DEC Manuals. Penguin.

Electrochemical Methods (TA455)
Three hours per week for two semesters.
Assessment: see teacher in charge.
An outline of the principles of conductivity, polarography, electrolyte position as applied to instrumental methods of analysis. Study of types of cells, electrodes and their uses. Electrolysis.

References
See teacher in charge.

Glassworking (TA453)
Three hours per week (evening).
Assessment will be made on a number of items made during the course.
The unit is completely practical and aims to give students confidence and familiarity in handling, using and repairing laboratory glassware. Students will be expected to complete ten basic exercises with glass tubing and rod working at a bench burner and then to fabricate something of their own choosing using some of the techniques acquired.

Introduction to Electronics (TA450)
Three hours per week for two semesters.
Assessment: written assignments and practical work.
This course is designed for students with a professional or hobby interest wishing to gain a practical knowledge of electronics and electronic equipment. Self-paced learning programs allow students of varying backgrounds to enter the course. Students are expected to undertake a number of constructional projects throughout the year. Class notes will be provided.

Laboratory Workshop Practice 1A and 1B (TA210, TA211)
Three hours per week for one semester.
The course is practical and will be taken for the greater part in appropriate workshops. Topics will include material and their properties, use of hand and power-operated tools, measuring instruments, joining techniques, soldering, glass blowing, technical drawing.

Reference
See teachers in charge.

Laboratory Management (TA212)
Two hours per week for one semester.
Assessment: assignments, design project and unit tests.
Appreciation of design of specific purpose laboratories. Examination of flow patterns for both materials and people. Stock control and ordering procedures. Maintenance of laboratory records. Operation of laboratory stores. Sources of information such as text books, manuals, catalogues, standards. Knowledge of the law regarding certain chemicals and their usage. Laboratory safety.

Reference
Class notes and other printed notes.

Materials and Processes 1A (TF230)
Three hours per week for one semester.
Assessment: practical work and one major test.

Reference

Material and Processes 1B (TF330)
Three hours per week for one semester.
Assessment: Practical work and one major test.

Reference

Methods of Separation (TA330)
Three hours per week for two semesters.
Assessment: technical reports, assignments, unit tests.
The principles, techniques and applications of the separation of the components of a mixture by means of ion exchange, chromatography in its various forms – electrophoresis – solvent extraction. For references used, see teacher in charge.

Microbiology 1S (TA460)
Three hours per week for two semesters.
Assessment: two exams, essays and assignments. Practical work.
Includes a series of lectures, demonstrations and practical work embracing bacteriology, viruses, fungi, protozoa and serology.

Reference
See teacher in charge.

Microbiology 2S (TA461)
Three hours per week for two semesters.
Assessment: see teacher in charge.
Lectures, tutorial, demonstration, practical laboratory techniques on bacteriology, immunology and virology as major topics.

Reference
See teacher in charge.
Microscopy and Scientific Photography (TA457)

Microscopy — Three hours per week for one term (term 1). Assessment: assignments, practical work and a final test.

This unit deals with types of microscopes (Optical Transmission Electron and Scanning Electron Microscopes), their component parts and method of functioning. Wherever possible examples of each type of microscope are used, inspected or demonstrated. This includes special areas of use such as metallurgy and petrology. Films are used as reinforcement to actual experience and practical exercises are performed in the preparation of samples for microscopy.

Reference

Scientific Photography is concerned with a wide spectrum of applied areas. Content of the course: studio lighting practice, macro-photography, preparation of printed circuit boards, photo-chemistry, infra-red applications and thermography, stress analysis and interferometry, holography theory, optics, special purpose materials and equipment, history of the subject, photography aids of scientific research in Antarctica, reprography systems, photo-mechanical processes.

References
Campbell-Drury, A. *Photography Notes*. Melb., Swinburne College Press

Oil and Polymer Chemistry (TA332)

Three hours per week for one semester

Assessment: tests and assignments.

This subject follows the development of the petroleum industry. An extensive account is given of the more important petroleum-derived products, with special reference to oils and polymers and their industrial applications.

References
See teacher in charge.

Optical Methods (TA430)

Three hours per week for two semesters

Assessment: unit tests, assignments and practical work.

A study of the various methods of chemical analysis using a variety of instruments, viz: colorimeters to spectrophotometers, fundamentals of UV/visible, atomic absorption and infra-red spectrometry. Flame photometry, mass spectrometry, nuclear magnetic resonance are also areas covered by lectures and demonstrations.

References

Organic Chemistry 1 (TA331)

Three hours per week for one semester.

Assessment: based on unit tests, assignments and practical work.

Provides a systematic study of organic compounds and their properties and reactions. Examples to favour those which are useful to a subsequent study of oils, polymers and detergents.

References
See teacher in charge.

Physics Laboratory Techniques 1 and 2 (TA122, TA222)

Three hours per week in the second semester of the first two years of the course.

Assessment: laboratory reports, project and laboratory technique.

Taught in the second semester over two years and includes the planning and design of experiments, safety precautions, use of correct units and care of apparatus in the fields of measurement, mechanics, electrical and optical work, heat temperature and properties of matter.

References
See teacher in charge.

Physics 18 (TA121)

Three hours per week for one semester.

Assessment: unit tests and assignments.

Course of theoretical physics at post-Leaving Certificate level including — measurement and dimensions, geometric optics, linear mechanics and rotational dynamics, hydrostatics, heat and temperature, electrostatics.

References
Class notes.

Physics 25 (TA221)

Three hours per week for one semester.

Assessment: unit tests and assignments.

Course of lectures at post-HSC standard includes — wave motion, thermodynamics, electro-magnetism, AC and DC circuits, properties of matter.

References

Physics 38 (TA459)

Three hours per week for one semester.

Assessment: unit tests and assignments.

Combines theory and technique exercises including physical optics, atomic and nuclear physics, acoustics — properties of matter.

Reference

Principles of Organisation (TS452)

Details to be approved

Quality Control (TA452)

Two hours per week for one semester.

Assessment: tests and assignment work.

Statistical methods — correlation, randomness, abbreviation of statistical testing — sign test, run test, rank test. Control charts and defect analysis. Sampling schemes. Process capability. For references used, see teacher in charge.

Radioactive Methods (TA456)

Three hours per week for one semester.

Assessment: assignments, tests and practical work.

Nuclear radiation, dosimetry, Radiation Chemistry. Legal and safety aspects in use of radioactive isotopes. Applications of isotopes in industry and research and chemical procedures. X-ray diffraction and X-ray fluorescence — instrumentation, experimental techniques and applications.

References
Carswell, D.J. *Introduction to Nuclear Chemistry*. Amsterdam, Elsevier, 1967

Other references will be discussed in class.

Statistics (TA144)

Two hours per week — evening only, one semester.

Assessment: consists of two 2-hour exams and two assignments.
This unit deals with basic descriptive statistics including measures of central tendency, frequency tables, measures of dispersion and methods of graphing and probability. Practical issues involved in experimental design and sampling techniques are investigated leading to probability distributions — Normal, Binomial and Poisson — and the definition of continuous and discrete variables. Statistical methods for experiment design and quality control in industry together with hypothesis testing, correlation, confidence intervals for means and standard deviations, \(t\)-, \(F\)-, and \(\chi^2\) tests are used in practical situations.

Reference


Vacuum Techniques (TA458)

Three hours per week for one semester.

Assessment: see teacher in charge.


References

See teacher in charge.

* *Biology 2A (TA251)
* Biology 2B (TA252)
* Educational Aid Techniques 1A (TA305)
* Educational Aid Techniques 1B (TA306)
* Educational Aid Techniques 1C (TA307)
* Educational Aid Techniques 1D (TA308)
* Laboratory Workshop Practice 2A and 2B (TA310, TA311)

*Typing

*These units are to be offered when the number of laboratory technicians increases sufficiently to warrant classes being held.

**Technical Colleges and Schools in the Knox Region**

**Proposed part-time evening classes for 1981**

The following information may help students to choose classes at the most convenient school offering the course in which they are interested. Enquiries concerning any of these classes should be directed to the college or school concerned.

**Blackburn Technical School**

Koonung Road, Blackburn, 3130

Telephone: 878 3777

Part-time Evening Classes 1980

Accounting 1A 1B

Behavioural Studies

Pottery

Woodwork (Hobby)

Supervision 1, 2

Business Procedures

Communication

Introduction to Law

Introduction to Economics

**Boronia Technical School**

Mount View Road, Boronia, 3155

Telephone: 762 4044

Elementary Book-keeping

Cake Decorating

Dressmaking

Hobby Engineering — making of wood-turning lathe

Painting and Chinese Painting

Pottery

Hostess Cookery

Photography

Hobby Woodwork

Computer Services

Creative Embroidery

Hobby Electrical Appreciation

Jewellery and Silversmithing

Typing

Shorthand

Welding

Enquiries should be directed to the Principal.

**Box Hill Technical College**

Dunloe Avenue, Box Hill, 3128

Telephone: 89 0231

Art

Life Drawing

Painting

Photography

Pottery/Ceramics

Architectural Drafting and Building Studies

Architectural Drafting and Design Projects 1

Architectural Drafting and Design Projects 2 & 3

Architectural Graphics

Architectural Photography

Basic Quantities and Estimating

Building Administration and Supervision

Building Construction 1A/1B

Building Construction 2A/2B

Building Construction 3A/3B
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Drafting Principles 1Q
Electrical Engineering 1Q
Environmental Control 1Q
Geology 1H
Management Accounting
Maths 1H
Maths Q
Mechanical Engineering 1Q
Mechanical Handling Equipment 1Q
Physics 1H
Plant Engineering 1Q
Quarry Management and Evaluation
Quarry Techniques
Quarried Materials
Quarry Supervisor (Short Course)
Roads and Railways 1Q
Shot Firing and Blasting
Supervision 1A
Surveying 1H Parts 1 and 2

Humanities
Adult Reading and Writing
Communication and Report Writing
English 1T and 2T
Leaving English for Housewives
Social Science 1H
Supervision 1A, 1B
TOP English

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Bridging Maths (Form 5)
Bridging Physics (Form 5)
Maths 1E, 2E
Maths 1H, 2H, 3H
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Maths for everyday living
Physics 1H
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Mechanical Engineering
Applied Electricity 1H
Applied Heat 1H
Applied Heat 1T
Applied Mechanics 1H, 2H, 3H
Applied Mechanics 1T
Bridging Graphics
Computer Studies
Engineering Practice 1H
Jig and Tool Drafting 1, 2, 3
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Production Processes and Development
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Motor Mechanics
Automatic Transmission
Diesel Mechanics
Owner/Driver Maintenance
Repeat Modules (Apprentice)

Plumbing
Decorative Metalwork
Introduction to Welding
Pipeline Design
Repeat Modules (Prac. and Theory)

Burwood Technical School
Cnr. Middleborough and Eley Roads, Burwood, 3125
Telephone: 288 6711

General (Hobby)
Pottery
Woodwork
Fun and Fitness
Painting for School Children
Photography
Art Metal (Daytime)

General (TAFE)
Typing

Ferntree Gully Technical School
Ferntree Highway, Upper Ferntree Gully, 3156
Telephone: 758 2466

TAFE Courses/Subjects
Building
Building Construction
Carpentry Apprentices
Plumbing Apprentices

Business
Basic Accounting
Certificate of Business Studies (Secretarial)
Shorthand
Typing
Accounting 1 & 2
Introduction to Law
Introduction to Economics

Engineering
Advanced Automotive Mechanics
Automotive Mechanics Apprentices
Electrical Mechanic Apprentices
Fitting and Machining Apprentices

General
Adult Reading Improvement
English, Leaving Technical

Hobby
Artmetal Work
Art (Painting)
Pottery
Welding (Hobby)
Woodwork (Hobby)
Owner-Drivers
Dressmaking and Pattern Drafting
Engineering Workshop (Hobby)
Jordanville Technical School
Vannam Drive, off High Street Road, Ashwood, 3147
Telephone 277 1509, 277 2212

Higher School Certificate Subjects
English Expression
Politics

Art
Pottery: (a) Advanced; (b) Beginners.
Painting:
(a) General, introducing painting to the beginner.
(b) Life class, disciplined drawing and painting for the
more advanced student.

Woodwork
(a) Beginners’ hobby class.
(b) Advanced hobby class.

Fitting and Machining
Engineering Workshop Practices

Business Studies
Shorthand (Pitman),
Typewriting: (a) Beginners; (b) Advanced.

Photography
Beginners

Knox Technical School
345 Boronia Road, Boronia, 3155
Telephone: 762 1055

Owner-driver Motor Mechanics course
English
Pottery
Painting
Typewriting
Shorthand (Pitman)
Gourmet Cookery
Cake Decorating
Dressmaking
Pattern Drafting
Woodwork
Photography
Sheetmetal
Book-keeping
Craft
Maths for Parents

Lilydale Technical School
Nelson Road, Lilydale, 3140
Telephone: 735 1133

Book-keeping
Shorthand
Typewriting
Preparatory Science (Year 10)
General Mathematics (Year 11)
General Science (Year 11)
Mathematics A (Year 11)
Mathematics B (Year 11)
Biology (Year 11)

Asian Cookery
Car Care
Dressmaking
Painting
Pottery
Woodwork

Mitcham Technical School
46 Dunlavin Road, Nunawading, 3131
Telephone: 874 1888.

Car Maintenance
Dressmaking
Pottery
Shorthand
Typewriting
Woodwork
Other classes according to demand

Mooroolbark Technical School
Reay Road, Mooroolbark, 3138
Telephone: 725 4388

General
Pottery
Typewriting
Woodwork — hobby
Welding — hobby
Other classes according to demand

Ringwood Technical School
Heathmont Road, Heathmont, 3135
P.O. Box 358, 3134
Telephone: 870 4555

Evening
Art — General
Pottery and Stoneware
Copperwork and Enamelling
Woodwork Hobbies
Dressmaking
Cake Decorating
Typing
Shorthand
Basic Book-keeping

Swinburne Technical School
505 Burwood Road, Hawthorn, 3122
Telephone: 819 1521

Dressmaking — Hobby class

Syndal Technical School
Lawrence Road, Mt Waverley, 3149
Telephone: 232 6022

English Expression

Year 12
English Literature
Music History & Literature

English

Year 11
Book-keeping
Shorthand (Beginners)
Shorthand (Speed)
Typing
Hobby Classes
Art — Oil Painting
Art — Sketching and Drawing
Art — Metalwork
Pottery and Ceramics
Carpentry — Woodwork Hobby
Owner-driver Machinistshop Hobby
Cookery — Beginners and International
Cooking — Hostess and Entertainment
Cooking — Gourmet and Patisserie
Cooking — Cake Decorating
Dressmaking
General Craft

Templestowe Technical School
Cypress Avenue, Lower Templestowe, 3107
Telephone: 850 6333
A co-educational technical school providing a range of secondary technical courses to year 11 level for boys and girls.

Evening Classes
Shorthand (Theory and Speed)
Typing (Beginners and Advanced)
Dressmaking/Needlecraft
Decorative Metalwork
Chinese Cookery
International Cookery
Cake Decorating
Woodwork
Owner-Driver
Engineering Hobby

Whitehorse Technical College
1000 Whitehorse Road, Box Hill, 3128
Telephone: 89 6245

Certificate Courses
Certificate of Business Studies
Accounting (Full-time/Part-time)
Banking (Part-time)
Intensive Studies — Secretarial
Book-keeper/Typist

Certificate of Technology
Clothing (Full-time)

Certificate of Applied Science
Animal Technician (Full-time)

Certificate of Applied Social Science
Library Technician

Animal Nursing Auxiliary Certificate

Child Care Aide Certificate

Apprenticeships
Floristry Apprenticeship

Specific Vocational Courses (Semester or Short Course)
Business Studies
Accounting Machines
Key Punch
Typing
Shorthand
Small Business Operators

Child Care
Early Childhood Development
Family and Society
Interpersonal Communication Skills

Clothing Studies
Patternmaking
Theatre Costumes
Machinist Training

Library Studies
Anglo-American Cataloguing Rules

Maths/Science
Science for Nurses

Media
Slide/Tape Program
16mm Projectionist

Access
Women's Programs
English as a Second Language

General Interest
Floral Art
Painting and Drawing
Pottery
Photography
China Painting
Garment Making
Textiles and Allied Crafts
Sewing for Men
Cake Decorating
Cookery — Basic, Hostess, International
Cooking for Men
Ladies Keep Fit
Piano Laboratory
Super 8 Film Making
Week-end Workshops
Subjects in a variety of craft areas
### January
- 5 SIT re-opens
- 26 **Australia Day**
- 27 STC course advisers available for consultation

### February
- 2 STC first term commences
- 3 and 4 STC — further enrolment period (except apprenticeship courses)
- 9 STC — all full-time and part-time classes commence, except *part-time* courses in Certificate of Business Studies, Tertiary Orientation Program and Certificate of Applied Science
- 16 STC classes in *part-time* Certificate of Business Studies, Tertiary Orientation Program and Certificate of Applied Science commence
- 23 SIT classes for first year courses in Applied Science, Business and Engineering commence

### March
- 2 SIT classes for first year courses in Arts commence
- 9 **Labour Day**
- 31 STC — last day for enrolment without incurring a late fee ($5.00), excluding apprentices
- 17 **Good Friday**
- 20 **Easter Monday**
- 21 SIT classes resume 8.00 am
- 25 **Anzac Day**

### April
- 3 SIT — last day for amendments to first semester enrolment
- 15 SIT classes cease 9.30 pm for Easter break
- 16 **Good Friday**
- 20 **Easter Monday**
- 21 SIT classes resume

### May
- 8 STC first term ends, classes cease 9.30 pm for vacation
- 18 SIT classes resume
- 25 STC classes resume

### June
- 8 **Queen's Birthday**
- 22 STC mid-year examinations, where appropriate, commence
- 25 SIT examinations commence

### July
- 3 STC mid-year examinations end
- 6 STC second semester commences
- 10 SIT first semester ends
- 20 SIT second semester commences

### August
- 21 STC second term ends, classes cease 9.30 pm for mid-semester break
- 31 SIT classes resume

### September
- 7 STC third term commences
- 11 SIT — last day for amendments to second semester enrolment
- 24 **Show Day**

### October
- 31 SIT and STC — last day for applications for awards

### November
- 3 **Melbourne Cup Day**
- 6 SIT study break for second semester examinations commences
- 9 STC formal classes cease
- 16 SIT examinations commence
- 27 STC end of year examinations end

### December
- 18 STC third term ends
- 19 SIT second semester ends
- 25 **Christmas Day**