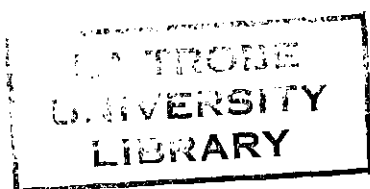


LA TROBE UNIVERSITY HANDBOOK 1975 VOL 2

Schools of
Agriculture,
Behavioural Sciences,
Biological Sciences,
Physical Sciences.



378.9451
L364c
1975 v.2
brf



La Trobe University

Handbook 1975

SCHOOLS OF AGRICULTURE
BEHAVIOURAL SCIENCES
BIOLOGICAL SCIENCES
PHYSICAL SCIENCES

378~~94~~ 31

L364c

1975

v. 2.

LA TROBE
UNIVERSITY
LIBRARY

CONTENTS

PART I INTRODUCTION

The Visitor	1
Members of Council	1
Officers of the University	2
Term Dates, Enquiries	2
Academic Staff and Schools	3
Senior Library Staff	15
Senior Administrative and College Staff	16
Introduction	17
Development	18
University Finances	19
Library	20
Language Centre	21
Computer Centre	21
Bookshop	22
Agora Facilities	22
Careers Advisory Service	23
Counselling Service	23
Health Service	24
Student Housing Service	24
The Colleges	25
Children's Centre	25
Public Transport	26
Sports Union	27
Students Representative Council	27
The Union	29
Commonwealth Tertiary Education Assistance Scheme	30
La Trobe University Research Scholarships	32
Commonwealth Postgraduate Awards	33
Education Department Studentships	34
Student Loans	35

PART II ADMINISTRATIVE PROCEDURES

Entrance to the University (requirements, pre-requisites, how to apply, admissions advice, offer of a place)	37
Enrolment Procedure (new students, continuing students, deferment, reserved place, permission to re-enrol, transfer, complementary course)	39
Variation of Enrolment	41
Withdrawal of Enrolment	41
Residential Address for Official Correspondence	42
Student Card	42
Official Notice Board	43
General Service Fee	43
Examinations (timetable, special consideration — illness or other disability, grades and results)	43
Class Timetable	44
Academic Record	45
Graduation	45

PART III SCHOOL OF AGRICULTURE

Details of Courses	53
Details of Subjects	55
Postgraduate Studies	60

PART IV SCHOOL OF BEHAVIOURAL SCIENCES

Clinical Psychology	61
Degree Structures including Psychology	61
Concurrent Courses in Education	62

PART V SCHOOLS OF BIOLOGICAL AND PHYSICAL SCIENCES

Degree of Bachelor of Science	64
Course Structures for the B Sc Degree	65
Subject Sequences	67
Academic Progress	69
Degree of Bachelor of Behavioural Science	70

PART VI GRADUATE STUDIES 71

PART VII DISCIPLINES

Agriculture	72
Behavioural Biology	72
Biochemistry	72
Biology	76
Botany	78
Chemical Physics	82
Chemistry	84
Economics	97
Education	97
Genetics	98
Geology	101
Mathematics	108
Microbiology	126
Philosophy	127
Physical Sciences	127
Physics	131
Psychology	142
Zoology	145

PART VIII TABLE OF SUBJECTS 150

PART I INTRODUCTION

THE VISITOR

His Excellency the Governor of Victoria, Sir Henry Winneke, KCMG, OBE,
QC, LL.M

MEMBERS OF COUNCIL

(as at 5 October 1974)

The Hon. Mr Justice Smithers *Chancellor*

Mr J.D. Norgard *Deputy Chancellor*

Dr D.M. Myers CMG *Vice-Chancellor*

Mr K.A. Aickin, QC

Mr J.J. Bayly

Professor E.K. Braybrooke

Dr R.W. Cattrall

Professor B.D. Ellis

Dr J.M. Fitzgerald

The Hon. J.W. Galbally QC, MLC

Mr A.J. Gorman

Miss C. Hardy

Dr A.P. Haydon

Mr J. McK. Hilliard

The Hon. W.V. Houghton MLC

Mr E. Lagzdin

Dr P.G. Law, CBE

The Reverend Dr J.D. McCaughey

Mr E.J. Michael

Mr W.G. Philip

Mr P.J. Saulwick

Dr L.W. Shears

Mrs C. Storey

Mr P.N. Thwaites

Mr C.C. Trumble

Professor J.S. Turner

Professor A.B. Wardrop

Mr J.R. Whitecross

Mr M.S. Whiting MLA

Mr M.H. Winneke

Professor H.A. Wolfsohn

OFFICERS OF THE UNIVERSITY

Vice-Chancellor D.M. Myers, CMG, B SC, D SC ENG, SYD, FIEE, FIE AUST, F INST P

Registrar D.D. Neilson, B EC (SYD)

Business Manager J.C. Janicke, BA, DIP ED (MELB)

Chief Librarian D.H. Borchardt, MA (NZ), DUP NZ LIB SCH, ALA (UK), FLAA

TERM DATES – 1975

First Term 9 weeks	10 March	10 May
---------------------------	----------	--------

Second Term 10 weeks	2 June	9 August
-----------------------------	--------	----------

Third Term 7 weeks	1 September	18 October
---------------------------	-------------	------------

Examinations begin 3 November and conclude 23 November 1975

Note

(1) The one-year Diploma in Education course commences on 3 March and Education II (concurrent course) commences on 5 March.

(2) Some departments may require students to attend the University for out-of-term activities as part of the courses offered.

ENQUIRIES

All enquiries should be directed to:

The Registrar,
La Trobe University,
Bundoora,
Victoria, 3083.

Telephone enquiries: 478 3122

Admission enquiries: Extension 2738.

ACADEMIC STAFF AND SCHOOLS

SCHOOL OF AGRICULTURE

<i>Dean</i>	Dr D.D. Leaver
<i>Professor</i>	Reid, R.L. B SC AGR (SYD), PH D (CANTAB), FRSE
<i>Senior Lecturers</i>	Connor, D.J. B AGR SC, PH D (MELB) Foster, W.N.M. MA, D PHIL (OXON), BVM&S, MRCVS Lamp, C.A. M AGR SC (MELB), PH D (TAS) Leaver, D.D. B V SC (SYD), M SC, PH D (MELB) Quilkey, J.J. B EC (SYD)
<i>Lecturers</i>	*Willatt, S.T. B SC (WA), M SC (NSW) <i>Chairman</i> Boston, R.C. M SC, PH D (MELB) Cranwell, P.D. B AGR SC, M AGR SC (MASSEY) Dumsday, R.G. B AGR SC (MELB), PH D (NE) *Luke, R.K.J. B AGR SC (MELB), PH D (ANU) Uren, N.C. B AGR SC, PHD (MELB)
<i>Senior Demonstrator</i>	Towns, Kristin, M. B AGR SC (MELB)
<i>Demonstrator</i>	Luong-Van, T. B AGR SC (MELB), PH D, DIP ED (LATROBE)

SCHOOL OF BEHAVIOURAL SCIENCES

<i>Dean</i>	Professor G. Singer
<i>Psychology</i>	
<i>Professor</i>	Singer, G. MA, PH D (SYD), FAPsS
<i>Senior Lecturers</i>	Francis, R.D. BA, MA (NZ), MA (MELB), DIP CRIM (CANTAB) Ng, K.T. BA, PH D (SYD) <i>Chairman</i>
<i>Lecturers</i>	Coleman, G.J. BA (SYD) Cumming, G.D. B SC (MON), D PHIL (OXON) Gibbs, Marie, E. B SC (MELB), PH D (MON) McKenzie, Beryl E. BA (MELB), PH D (MON) Montgomery, R.B. BA (SYD), PH D (MACQUARIE) Wallace, Meredith BA (SYD), PH D (MACQUARIE)
<i>Senior Demonstrator</i>	Foddy, Margaret L. BA (SASK)
<i>Demonstrator</i>	Thorburn, Kristina S. B SC (NSW)
<i>Social Work</i>	
<i>Professor</i>	Bisno, H. BA (WISCONSIN), M SW (CALIF)

SCHOOL OF BIOLOGICAL SCIENCES

<i>Dean</i>	Professor P.A. Parsons
-------------	------------------------

Biochemistry

<i>Professor</i>	Stone, B.A. B SC (MELB), PH D (LOND) <i>Chairman</i>
<i>Senior Lecturers</i>	Polya, G.M. B SC (TAS), PH D (FLINDERS) Scopes, R.K. BA, PH D (CANTAB)
<i>Lecturers</i>	Hoogenraad, N.J. B AGR SC, PH D (MELB) Phillips, D.R. B SC, PH D (ADEL)
<i>Demonstrators</i>	Cavell, Suzanne M SC (LA TROBE) Stewart, A.A. B SC (ANU)

Botany

<i>Professor</i>	Wardrop, A.B. M SC (TAS), PH D (LEEDS), D SC (MELB), <i>Chairman</i>
<i>Senior Lecturers</i>	Anderson, J.W. B AGR SC, PH D (MELB) Parsons, R.F. B SC (ADEL), PH D (MELB) Staff, I.A. M SC, DIP ED (SYD), PH D (S ILL)
<i>Lecturers</i>	Keane, P.J. B AGR SC (ADEL), PH D (UPNG) Pallaghy, C.K. B SC (MELB), PH D (TAS) Whiffin, T.P. MA (CANTAB), PH D (TEXAS) Williamson, R.E. MA, PH D (CANTAB)
<i>Senior Demonstrators</i>	Phippard, J.H. B PHARM (SYD), M PHARM (QLD) Wong Hee, K. B SC (LA TROBE)

Genetics and Human Variation

<i>Professor</i>	*Parsons, P.A. B AG SC (ADEL), M SC (MELB), PH D (CANTAB) <i>Chairman</i>
<i>Lecturers</i>	Frapp, Yvonne J. B SC AGR (SYD), PH D (BIRM) Graves, Jennifer M. M SC (ADEL), PH D (CALIF) Hay, D.A. MA (ABERDEEN), PH D (BIRM) *Hynes, M.J. B AG SC (ADEL), PH D (FLINDERS) Mac Bean, I.T. B SC (MELB), PH D (LA TROBE) Mac Phee, D.G. B SC, PH D (EDIN) McKenzie, J.A. B SC, PH D (LA TROBE) Murray, N.D. B SC, PH D (SYD) Westerman, M. B SC, PH D (BIRM)
<i>Research Fellows</i>	Imray, F. Paula B SC (MELB) McKechnie, S.W. B SC, PH D (SYD) Mitchell, R.J. BA, DIP ANTHROP (DURHAM)
<i>Senior Demonstrators</i>	Chew, Guat Kin B SC (MELB) Rose, Astrid B SC, DIP ED (MELB) White, N.G. B SC (LA TROBE)
<i>Demonstrator</i>	McCauley, L.A. B SC (WASH), MA (ILL)
Microbiology	
<i>Professor</i>	Waid, J.S. B SC (LOND), B SC, PH D (OXON)

Zoology

Professor

Thornton, I.W.B. B SC, PH D (LEEDS) *Chairman*

Senior Lecturers

Danthanarayana, W. B SC (CEYLON), PH D (LOND), DIC

Marshall, A.T. B SC (LEEDS), PH D (HK), DIC

New, T.R. B SC, PH D (LOND), ARCS, DIC

*Woolley Patricia A. B SC (WA), PH D (ANU)

Wright, A. B SC, PH D (LIV)

Lecturers

Rawlinson, P.A. B SC (MELB)

Warren, Anne A. B SC (SYD), PH D (CANTAB)

Zann, R.A. B SC, DIP ED (NE), PH D (QLD)

Research Fellows

Barnett, J.L. B SC (SHEFF), PH D (MON)

Beattie, T.M. B SC, PH D (TAS)

How, R.A. B SC, PH D (NE)

Humphreys, W.F. B SC (WALES), PH D (ANU)

Senior Demonstrator

McCallum, Frances M.E. MA, B SC (OXON)

Demonstrators

Cooper, K.F. B SC (FLINDERS)

Stahle, P.P. B SC (LA TROBE)

SCHOOL OF EDUCATION

Dean

Professor B. Crittenden

Sub-Dean

Mr S.Oates

Centre for Comparative and International Studies in Education

Professor

Goldman, R.J. BA (MANC), MA (CHIC), MA, PH D (BIRM),
NFF DIP FBPS

Reader

*Lovegrove, M.N. BA (NZ), MA, PH D (AUCK), DIP TEACH
(ATC), ABPS, MIAAP

Senior Lecturers

*Bessant, B. BA, M ED (MELB), PH D (MON)

Price, R.F. B SC, PH D (LOND), MI BIOL *Chairman*

Sheehan, B.A. B COMM, B ED (MELB), MA (LOND)

Exchange Lecturer

Cowen, R. B SC, DIP ED, MA (LOND), DIP ED (DUBLIN)

Lecturers

Burns, Robin BA (SYD), M SC (MON)

Collins, K. B ED (WA), MA (ALBERTA), PH D (MICH)

Kelabora, L. BA, DIP ED (ADEL), B ED, M ED (MON)

Simkin, K. BA, B ED (MELB), MA (TORONTO)

Research Fellow

Newman, R.S. BA, M SC, PH D (CORNELL)

Centre for the Study of Educational Communication and Media

Senior Lecturers

Edgar, Patricia M. BA, B ED (MELB), MA (STAN), PH D
(LA TROBE)

Newton, R.A.C. B COMM (MELB), MA (STAN)

Lecturers

Bertrand, Ina BA, DIP ED (MELB), PH D (LA TROBE)

Drummond, P.A. BA (MON) ATTI (DIP-MERCER HOUSE)

Flaus, J.W. BA (SYD)

Mills, R.I. BA (SYD), MA (ADEL), PH D (WISCONSIN)

Chairman

Lar, Rede BA (MISSOURI), PH D (CALIF)

Tutor

Counihan, M. BA (MON) TSTC

Centre for the Study of Innovation in Education

Reader

Turner, M.L. B SC, B ED (MELB), MA, ED D (CALIF)

Chairman

Lecturers

Mathews, Rivkah BA, B ED, M ED (MELB)

+Szorenyi-Reischl, N. BA (ADEL), MA (MELB)

*Wesson, Gwenneth BA, B ED (MELB)

White, D.C. B SC, B ED (MELB), TPTC, M ED (LA TROBE)

Senior Tutors

Goodman, P.B. BA (MELB), DIP ED (LA TROBE)

Hinkson, J. B COMM (QLD)

Centre for the Study of Teaching and Human Interaction

Reader

Lett, W.R. BA, B ED (MELB), PH D (CALIF) *Chairman*

Visiting Fellow

Conklin, R.C. BA, M ED, PH D (ALBERTA)

Lecturers

*Brown, A.J. BA, B ED (MON), TPTC

Duckers, A. B SC (LOND)

Gasson, I.S.H. DIP PHYS ED (LEEDS), B ED (BR COL),
M SC (WASH), PH D (OHIO)

Hubbard, R.S. BA (STAN), MA, PH D (CLAREMONT)

Neville, B. BA, MA (ADEL)

*Rado, Marta PH D (BUDAPEST), DIP ED (MELB)

Wills, G. BA, TSTC, DIP PSYCH (MELB)

Senior Tutor

Williams, A.J. BA, B ED (MELB)

Centre for the Study of Urban Education

Professor

Craft, M. B SC ECON (LOND), H DIP ED (DUBLIN), ACAD,
DIP ED (LOND), PH D (LIV) *Chairman*

*Principal Research
Fellow*

Townsend, H.E.R. BA (LOND), M ED (MANC)

Senior Lecturers

Claydon, L.F. DIP ED, MA (BRIST), MA (LOND)

Knight, A. B SC, M SC, PH D (OREGON)

Poole, Millicent E. BA, B ED (QLD), MA (NE), PH D
(LA TROBE)

*Toomey, D.M. BA (MANC), DIP ED (LEEDS), MA (KENT)

Lecturer

Lever, Constance BA, MA (LOND)

Senior Tutor

Hampel, B. BA, DIP ED (MELB), ASSOC LOND INST ED

School

Professor

Crittenden, B. BA, MA (SYD), PH D (ILL)

Senior Lecturer

Oates, S. BA, B ED (MELB), TPTC

+ Joint appointment with the Department of Philosophy.

<i>Lecturer</i>	Hodgson, C.P. B SC (DURHAM), M SC (E ANGLIA), DIP ED (DURHAM)
<i>Senior Tutor</i>	Shelley, Nancy BA (MELB), B ED (LA TROBE)
<i>Research Fellow</i>	Marsh, Barbara B SC (MELB)

SCHOOL OF HUMANITIES

<i>Dean</i>	Professor J.A. Salmond
Art History	
<i>Professor</i>	Tomory, P.A. MA (EDIN) <i>Chairman</i>
<i>Senior Lecturer</i>	Gaston, R.W. MA, PH D (LOND)
<i>Lecturers</i>	Ellem, Lucy M. BA (MELB), MA, M PHIL (YALE) McPhee, I.D. BA (SYD), PH D (CINC)
<i>Tutor</i>	Wood, C. BA, DIP ED (MELB)
English	
<i>Professors</i>	de Chickera, E.B. BA (LOND), B LITT (OXON) Marsh, D.R.C. BA, PH D (NATAL) <i>Chairman</i>
<i>Readers</i>	Barnes, R.J. MA (MELB), MA (CANTAB) French, A.L. MA, M LITT (CANTAB)
<i>Senior Lecturers</i>	*Burns, G.J. MA (MELB) Gribble, Jennifer M. MA (MELB), B PHIL (OXON) Kearney, A.M. BA (KEELE), M LITT (LANC) Rawlinson, D.H. MA (CANTAB), AM (STAN) Wiltshire, J.A. BA (CANTAB)
<i>Lecturers</i>	Blake, Ann MA, B LITT (OXON) *Clancy, L.J. BA (MELB), MA (LA TROBE) Frost, Lucile BA (WILSON COLLEGE), AM, PH D (ROCH) Gardiner, N.B. BA (HCNY), MA (ARIZ), PH D (LOND) Hancock, Susan M. MA (CANTUA), MA (OXON) Henry, G.B.M. BA (MELB), MA (SYD) Jones, D.G.H. MA (CANTAB) Richards, M.E.A. MA (AUCK) *Rodriguez, Judith C. BA (QLD), MA (CANTAB) Stanyon, C. BA (KEELE) *Watson, C.J. BA (MELB), PH D (BR COL) *Wightman, Jennifer A. MA (ADEL) Williams, B.J. BA (WA), BA (CANTAB)

French

Professor

Forsyth, E.C. BA, DIP ED (ADEL), DU (PARIS), FAHA
OFFICIER DES PALMES ACADEMIQUES *Chairman*

Senior Lecturers

Hooke, R.L.G. BA (MELB), MA (ESSEX) on secondment
to Language Centre

Paradissis, A.G. BA (LOND), MA, PH D (MELB), MA
(LA TROBE), L EN D (L'AUREORE; SHANGHAI)

Lecturers

*Schutte, Marie-France M ES L (PARIS)

Masterman, Lindis E. BA (MELB), DES (PARIS)

History

Professors

Gregory, J.S. MA (MELB), PH D (LOND) *Chairman*

Joyce, R.B. BA, LL B (SYD), M LITT (CANTAB)

Salmond, J.A. MA (OTAGO), PH D (DUKE)

Readers

Mulligan, Lotte MA (MELB), PH D (ADEL)

Phillipp, June M. MA, PH D (MELB)

Senior Lecturers

Ahmad, Z. BA (CALCUTTA), BA (LOND), B LITT (OXON)

Barrett, J. BA (ADEL), PH D (ANU)

Breen, W.J. BA (MELB), MA, PH D (DUKE)

Haydon, A.P. BA (ADEL), MA, PH D (YALE)

Hirst, J.B. BA, PH D (ADEL)

*Isaac, R.L. BA (CAPETOWN), MA (OXON)

Johanson, D.F.C. BA (MELB), MA (OXON)

*Phillips, W.W. BA (ADEL), PH D (ANU)

*Stremski, R.R. BS (LOYOLA), MS, PH D (WISCONSIN)

*Tyrrell, A.A. MA (EDIN), MA (MCMASTER)

Ward, A.D. MA (NZ), PH D (ANU)

Lecturers

Barta, A.A. MA (OTAGO)

Bull, P. BA (ADEL), PH D (CANTAB)

Carr, B. MA (OXON)

Cashmere, J.J. BA (NSW), DIP ED (SYD), MA (TAS)

Clendinnen, Inga V. MA (MELB)

*Cook, P.S. B EC, BA (ADEL), PH D (ANU)

Disney, A. MA (OXON), DIP ED (MELB), MA, PH D (HARV)

Douglas, Bronwen P. BA (ADEL), PH D (ANU), DTS

Dunning, T.D. MA, PH D (CALIF)

Ellem, W. BA (NE), MA, M PHIL (YALE)

Ferrell, D. MA (UNC), PH D (ANU)

Frost, A.J. MA (QLD), PH D (ROCH)

Graham, J.K. BA (MON)

Hammerton, A.J. BA (SIR G. WMS), PH D (BR COL)

*Huish, D.J. BA (CANTAB), PH D (ANU)

Jeffcott, C.A. BA (NZ), BA (OXON), PH D (ANU)
 Johnson, R.A. BA (MELB)
 Kent, Dale V. BA; DIP ED (MELB), PH D (LOND)
 *Martell, W.H.T. BA, DIP ED (MELB)
 Murray, W.J. BA (ADEL), PH D (ANU)
 Potts, D.J.E. MA (MELB), B ED (LA TROBE)
 Richards, Judith MA (AUCK)
 Rule, P.A. BA (MELB), PH D (ANU)
 Shultz, R.J. BA (IOWA), MA (OMAHA), PH D (ANU)
 Spear, T. BA (WILLIAMS), MA, PH D (WISCONSIN)

Linguistics

Lecturer Miller, G. BA (TAS)

Music

Professor Humble, L.K. DIP MUS (MELB)

Philosophy

Professors Ellis, B.D. B SC, BA (ADEL), B PHIL (OXON) FAHA

*McCloskey, H.J. MA, PH D (MELB) FAHA

Reader Smart, J.J.C. MA (GLAS), B PHIL (OXON), FAHA

Senior Lecturers Hyslop, A. MA (ADEL)

Jackson, F.C. B SC, BA (MELB)

McCullagh, C.B. BA (SYD), MA, PH D (CANTAB)

Mitchell, Dorothy J. MA (MELB), B PHIL (OXON)

Oakley, I.T. BA (MELB), B PHIL (OXON)

Pinkerton, R.J. BA (SYD), B PHIL (OXON) *Chairman*

Richards, T.J. MA (WELL), D PHIL (OXON), FRAS

Lecturers Brady, R.T. B SC (SYD), MA (NE), PH D (ST AND)

Cann, M.R. BA, B MUS, AUA (ADEL)

Farrell, R.J. B SC (NSW), MA (HARV)

Fox, J.F. BA (MELB)

Giles-Peters, A.R. BA (MELB), MA (LA TROBE)

Kroy, M. BA, MA (HEBREW), PH D (TEL AVIV)

Mackie, Alwynne MA, PH D (MELB)

Murphy, C.P. BA (SYD)

*Pargetter, R.J. B SC, MA (MELB), DIP ED (MON)

Phillips, R.G. BA (QLD)

Singer, P.A.D. BA, MA (MELB), B PHIL (OXON)

+Szorenyi-Reischl, N.A. BA (ADEL), MA (MELB)

Thompson, Janna L. BA (MINN), B PHIL (OXON), DIP ED (MON)

+ Joint appointment with School of Education

	von Thun, M. BA, PHD (SYD)
	Watson, I. BA (MELB), MA (McMASTER)
	Young, R.B. B EC, BA, MA (SYD), PH D (FLINDERS)
<i>Instructor</i>	Fox, R.A. LLB, MA (MELB)
<i>Senior Tutor</i>	Fleming, P.J. MA (MELB)
<i>Tutors</i>	Cushan, Anna M. BA (LA TROBE)
	Uniacke, Suzanne M. BA (LA TROBE)

Spanish

<i>Professor</i>	Thompson, R.W. MA (DUBLIN), FAHA <i>Chairman</i>
<i>Lecturers</i>	*Rodriguez, F. L EN L (MANIZ), DIP EN LIT HISPANO-AMERICANO (CARO Y CUERVO)
	Scarfe, F.H.B. MA (OXON), DIP DE ESTUDIOS HISPANICOS (SALAMANCA)
<i>Instructor</i>	Sangiau, J.M.
<i>Senior Tutor</i>	Valiente, M.R. LICDO EN LETRAS (ZARAGOZA)

SCHOOL OF PHYSICAL SCIENCES

<i>Dean</i>	Professor R.J. Magee
-------------	----------------------

Communication Engineering

<i>Professor</i>	Hooper, D.E. B EE, M E (MELB)
------------------	-------------------------------

Inorganic and Analytical Chemistry

<i>Professor</i>	Magee, R.J. B SC, M SC (QUB), PH D, D SC (EDIN), FICI, FRIC, FRSH, FRACI, <i>Chairman</i>
<i>Senior Lecturers</i>	Cardwell, T.J. B SC, PH D (QUB), ARIC, ARACI
	Cattrall, R.W. B SC, PH D (ADEL), FRACI
	*O'Connor, M.J. B SC (ADEL), PH D (MON), ARACI
<i>Lecturers</i>	Hill, J.O. B SC (LOND), PH D (SURREY), ARACI
	Wedd, A.G. B SC, PH D (TAS)
<i>Research Fellows</i>	Grant, M.W. BA, PH D (CANTAB), ARACI
	Slater, S.J.E. B SC (NSW), PH D (LA TROBE), ARACI
<i>Senior Demonstrators</i>	Krankovits, Emilia M. B SC (BUDAPEST), M SC (LA TROBE), ARACI
	Tariq, S.A. M SC (PANJAB), PH D (SOTON) ARACI

Organic Chemistry

<i>Professor</i>	*Topsom, R.D. M SC (NZ), PH D (LOND), FRIC, FRACI, FNZIC <i>Chairman</i>
<i>Senior Lecturers</i>	Davis, M. BA, PH D (CANTAB), FRACI
	Deady, L.W. M SC, PH D (CANTUA), MNZIC

	Ternai, B. B SC, DIP CHEM ENG (BUDAPEST), M SC (MELB), PH D (E ANGLIA), ARACI
<i>Lecturers</i>	Brownlee, R.T.C. BA (CANTAB), M SC, PH D (E ANGLIA), ARACI
	Broxton, T.J. B SC, PH D (WA)
	Reiss, J.A. B SC, PH D (ADEL), ARACI
<i>Research Fellow</i>	Wilson, R.B. B SC, PH D (MON)
Physical Chemistry	
<i>Professor</i>	Morrison, J.D. PH D, D SC (GLAS), FAA, FRACI <i>Chairman</i>
<i>Senior Lecturer</i>	*Arthur, N.L. B SC, PH D (ADEL), ARACI
<i>Lecturers</i>	Christie, J.R. B SC, PH D (ANU)
	Mackay, Maureen F. B SC (SYD), PH D (MELB)
	Nyberg, G.L. B SC (WA), PH D (CANTAB)
	Peel, J.B. B SC, B ED (MELB), PH D (MON), ARACI
<i>Senior Research Fellow</i>	Smith, J.F. M SC (LA TROBE), ARMIT
<i>Research Fellow</i>	Traeger J.C. B SC (MELB), PH D (LA TROBE)
Geology	
<i>Professor</i>	White, A.J.R. B SC (ADEL), PH D (LOND) <i>Chairman</i>
<i>Lecturers</i>	Gray, C.M. B SC (ADEL), PH D (ANU)
	Kwak, T.A.P. B SC, M SC (BR COL), PH D (McMASTER)
	Price, R.C. B SC (ANU), PH D (OTAGO)
<i>Demonstrator</i>	Christie, D.M. B SC (ANU)
Applied Mathematics	
<i>Professor</i>	Eliezer, C.J. M A, PH D (CANTAB), M SC, D SC (LOND) BAR-AT-LAW (MIDDLE TEMPLE), FIMA <i>Chairman</i>
<i>Senior Lecturers</i>	Andrew, A.L. M SC (NZ), M SC (ANU), PH D (LA TROBE)
	Cohen, H.A. B SC (SYD), PH D (ANU)
	Johnston, R. B SC (GLAS)
	Ross, D.K. MA (MELB), PH D (MANC), FIMA
	Roy, S.K. M SC, PH D (PATNA), FIMA, F INST P
	+Woodhouse, D. MA, D PHIL (OXON), M SC (E AF), MLMS, MACS
<i>Tutor</i>	Robb, P. B SC (LA TROBE), BA (MELB) seconded from Preston Institute of Technology
+ Joint appointment with the Department of Pure Mathematics	
Mathematical Statistics	
<i>Professor</i>	Brockwell, P.J. B EE, BA, MA (MELB), PH D (ANU) <i>Chairman</i>

<i>Senior Lecturers</i>	Becker, N.G. M SC (MELB), PH D (SHEFF) Staudte, R.G. BA, B SC (BROWN), M SC, PH D (ILL)
<i>Lecturer</i>	*Basawa, I.V. MA (KARNATAK), PH D (SHEFF)
<i>Tutor</i>	Moignard, Katherine V. BA (MELB)
Pure Mathematics	
<i>Professor</i>	Mond, B. BA (YESHIVA), MA (BUCKNELL), PH D (CINC) <i>Chairman</i>
<i>Senior Lecturers</i>	Jones, A.R. MA, PH D (MELB) *Pearson, K.R. BA, PH D (ADEL) +Woodhouse, D. MA, D PHIL (OXON), M SC (E AF), MLMS, MACS
<i>Lecturers</i>	Davis, G.E. B SC, PH D (MON) Elton, G.C. M SC (NZ), PH D (ANU) Strantzen, J.B. B SC (MELB)
<i>Senior Tutor</i>	Gray, A.R. BA (MON)
<i>Tutor</i>	Fox, C.D. B SC (MON), PH D (ANU)
+ Joint appointment with department of Applied Mathematics	
Physics	
<i>Chairman</i>	Professor D. Elwyn Davies
DIVISION OF ELECTRON PHYSICS	
<i>Professor</i>	Davies, D. Elwyn B SC, PH D (WALES), F INST P, FAIP <i>Head</i>
<i>Senior Lecturers</i>	Jenkin, J.G. B SC (ADEL), PH D (ANU), AAIP Leckey, R.C.G. B SC, PH D (QUB), M INST P *Lee, A.R. B SC (HK), PH D (LOND), M INST P Liesegang, J. B SC (QLD), D PHIL (OXON), FAIP
<i>Lecturers</i>	Miller, R.B. B SC, PH D (NE) Riley, J.D. B SC, B ENG (SYD), PH D (OXON)
DIVISION OF THEORETICAL AND SPACE PHYSICS	
<i>Professor</i>	Cole, K.D. M SC, DIP ED, D SC (QLD), FAIP, F INST P <i>Head</i>
<i>Honorary Reader</i>	Armstrong, E.B. B SC, PH D (QUB)
<i>Senior Lecturers</i>	Butcher, E.C. B SC, PH D (EXETER), M INST P Dyson, P.L. B SC, PH D (MELB) Essex, Elizabeth A. B SC, PH D (NE) McLaughlin, I.L. B SC, PH D (ADEL)
<i>Lecturer</i>	*Kalotas, T.M. BE, M SC (NSW), D PHIL (SUS)
<i>Research Fellow</i>	Hammer, P.R. B SC, PH D (MELB)

SCHOOL OF SOCIAL SCIENCES

<i>Dean</i>	Professor E.K. Braybrooke
Economics	
<i>Professors</i>	Burley, S.P. B SC, PH D (ADEL), MA, PH D (PRIN) Davidson, F.G. MA (CANTAB) Whitehead, D.H. MA (OXON) <i>Chairman</i>
<i>Visiting Professor</i>	Dasgupta, A.K. BA (CALCUTTA), BA, PH D (CANTAB)
<i>Senior Lecturers</i>	Anderson, J.L. BA (NE) Burley, H.T. B EC (ADEL), MA, PH D (CANTAB) Csapo, L. MA, PH D (BUDAPEST) Horrigan, W. MA (WALES) *Schneider, M. BA (ADEL), M SC (CANTAB) Scorgie, M.E. B COMM (MELB) Stent, W.R. B AGR SC (MELB), DTA (TRIN), DIP AGR EC (OXON) Thomas, K.D. BA (ADEL), M EC (CALIF)
<i>Lecturers</i>	Dahlman, C.J. FIL KAND (STOCKHOLM), C PHIL (CALIF) Hazari, B.R. BA, MA (DELHI), AM, PH D (HARV) Huynh, F.H.C. B COMM (WA), M EC (MON), PH D (MICH STATE) Kiefer, D.M. BS (CARNEGIE INST TECH), MA, PH D (MICH) Langley, P.C. B SC (HULL), MA (CARLETON) *O'Brien, G.C. B SC (QLD), M SC (NE), PH D (ANU) Weston, Caryl R. B COMM (MELB), B JURIS, LLB, PH D (MON)
<i>Visiting Lecturers</i>	Elsum, D.L. B ENG, B COMM (MELB), M SC, PH D (GEORGIA INST TECH) Paterson, Helen B COMM, DIP ED (MELB), AASA Subocz, V. M COMM (MELB), PH D (LOND), AASA
<i>Instructors</i>	Sparkes, R.J. B EC (LA TROBE) Wiltshire, Zaiga M EC (SYD)
<i>Senior Tutors</i>	MacDonald, A.B. MA (GLAS) Sgro, P. B EC (LA TROBE) Watkins, J.D. B EC (MON)
Legal Studies	
<i>Professor</i>	Braybrooke, E.K. LL M (NZ), LL M (COLUMBIA) Barrister and Solicitor of the Supreme Courts of NZ and WA <i>Chairman</i>
<i>Senior Lecturer</i>	Bayne, P.J. LL B (MELB), J D (CHICAGO)

<i>Lecturers</i>	<p>Creed, D.M. BA, LL B (ANU) Barrister of the Supreme Court of NSW</p> <p>Douglas, R.N. BA, LL B (MELB), M PHIL (YALE)</p> <p>+FitzGerald, J.M. LL B (MELB), LL M, MA, PH D (NORTHWESTERN)</p> <p>Petersen, Kerry A. LL B (MELB) Barrister and Solicitor of the Supreme Court of Victoria</p> <p>Willis, J.E. BA, LL B, DIP ED (MELB) Barrister and Solicitor of the Supreme Court of Victoria</p>
<i>Senior Tutors</i>	<p>Bird, Greta M. LL B (MELB) Barrister and Solicitor of the Supreme Court of Victoria</p> <p>Boer, B.W. BA, LL B (MELB) Barrister and Solicitor of the Supreme Court of Victoria</p> <p>Fristacky, Jackie M. BA, LL B (MELB) Barrister and Solicitor of the Supreme Court of Victoria</p> <p>+Joint appointment with the Department of Sociology.</p>
Politics	
<i>Professors</i>	<p>Martin, R.M. MA (NZ), PH D (ANU)</p> <p>Wolfsohn, H.A. BA (MELB) <i>Chairman</i></p>
<i>Reader</i>	Rydon, C. Joan BA, DIP ED (SYD), PH D (MELB)
<i>Senior Lecturers</i>	<p>*Glezer, L. BA (MELB)</p> <p>Miller, J. MA (CANTAB)</p>
<i>Lecturers</i>	<p>Camilleri, J. BA (MELB), MA (MON), PH D (LOND)</p> <p>Chiddick, J.P. BA, B PHIL (OXON), M SC (LOND)</p> <p>James, M.H. BA, PH D (DURHAM)</p> <p>Manne, R. BA (MELB), B PHIL (OXON)</p> <p>Plehwe, R. BA, LL B (TAS), PH D (DUKE)</p> <p>Polis, T. BA (MELB)</p> <p>Rubenstein, C.L. MA (MELB), PH D (COLUMBIA)</p> <p>*Schehtman, J. BA (JERUSALEM)</p>
<i>Senior Tutors</i>	<p>Butman, G. B EC (MON)</p> <p>Garland, P. BA (MELB)</p> <p>Henderson, G.J. BA, LL B (MELB)</p> <p>McCoppin, G. Brigid BA (MELB)</p>
Sociology	
<i>Professors</i>	<p>Bell, R.R. BA (MICHIGAN), MA (INDIANA)</p> <p>Veliz, C. B SC (FLOR), PH D (LOND), <i>Chairman</i></p>
<i>Reader</i>	Edgar, D.E. BA, M ED (MELB), PH D (STAN)
<i>Senior Lecturers</i>	<p>*Balmer, C.J. BA (TAS), ED D (FLOR)</p> <p>Cubbon, H.A. MA (CANTAB), PH D (MELB)</p> <p>Dempsey, K.C. BA (SYD), DIP ED, PH D (NE)</p>

	Hickman, D.C. BA, B ED (MELB), PH D (ANU)
	Ireland, R.H. BA (MELB), PH D (HARV)
	Mulligan, D.G. MA (NZ), PH D (LOND)
	Rose, G. MA (OXON), MA (CANTAB)
	*Schutte, H. DIPL HDL (COLOGNE), DR SC POL (KIEL)
	*Trahair, R.C.S. BA, PH D (MELB)
<i>Lecturers</i>	Carroll, J.B. BA (MELB), MA, PH D (CANTAB)
	Donaldson, Beryl A. BA, B ED (MELB), MA (TORONTO)
	+ FitzGerald, J.M. LL B (MELB), LL M, MA, PH D (NORTH-WESTERN)
	Harvey, Susan D. BA (WA), DIP SOC STUD (SYD), MA (ANU)
	Kilmartin, L.A. BA (QLD), MA (ANU)
	Kitaoji, H. BA (INTERNATIONAL CHRISTIAN), MA (TEXAS)
	Otto, Rosemarie BA, DIP SOC STUD (MELB)
	Pelz, W. BA (LOND), PH D (BRISTOL)
	Richards, Marilyn G. BA (ADEL), MA (LA TROBE)
	Richmond, Catherine M.G. BA (MELB), MA (ANU)
	Sugimoto, Y. BA (KYOTO), PH D (PITTSBURGH)
	Ternowetsky, G.W. BA (WINNIPEG), MA (CALGARY)
	Wearing, Rosemary J. BA (ADEL), MA, PH D (ILL)
<i>Senior Tutor</i>	Kelly, Elizabeth BA, DIP SOC STUD (MELB)
<i>Research Assistant</i>	Marsh, G. BA (LA TROBE)
+ Joint appointment with legal studies.	
* On leave for part of 1975, please contact relevant department for details.	

SENIOR LIBRARY STAFF

<i>Chief Librarian</i>	Borchardt, D.H. MA (NZ), DIP NZ LIB SCH, ALA (UK) FLAA
<i>Readers Services</i>	
<i>Assoc. Librarian</i>	Scrivener, J.E. BA, DIP ED (TAS), ALA (UK) ALAA
<i>Senior Reference Librarian</i>	Choate, C.R. BA (WYOM), MS IN LS (COLOMBIA), ALAA
<i>Reference Librarian</i>	Hyslop, Margot J. BA (MELB), ALAA
<i>Lending Librarian</i>	Quinn, E.G. BA (QUB), ALAA
<i>Selection</i>	
<i>Senior Librarian</i>	Barraclough, H.C. BA (MELB), MA (CALIF), ALAA
<i>Serials</i>	
<i>Librarian-in-Charge</i>	Longley, Pamela R. BA (TAS), ALAA
<i>Documents Librarian</i>	Miller, Ann E. BA (MELB), ALAA
<i>Systems Librarian</i>	

Technical Services

<i>Assoc. Librarian</i>	Stecher, G. BA (MELB), BLS (MCGILL), ALAA
<i>Senior Librarian</i>	*McKinlay, J.W. BA (TAS), ALAA
<i>Librarians</i>	Hoffman, Helen K. BA (MELB), ALAA
	Horecek, J.I. BA (MELB), MA (LOND), ALAA

SENIOR ADMINISTRATIVE AND COLLEGE STAFF

<i>Vice-Chancellor</i>	Myers, D.M. CMG, B SC, D SC ENG, SYD, FIEE, FIE AUST, F INST P
<i>Registrar</i>	Neilson, D.D. B EC (SYD)
<i>Deputy Registrar</i>	Griffith, D.A.C. TD, B SC (ENG) (LOND), AFAIM
<i>Assistant Registrar</i>	Kellock, M.D. BA (MELB)
<i>Staff Officer</i>	Tolhurst, N.M. BA (LA TROBE)
<i>Business Manager</i>	Janicke, J.C. BA, DIP ED (MELB)
<i>Deputy Business Manager</i>	Christie, R.C. B EC (CIVIL), B COMM (MELB)
<i>Deputy Business Manager (Physical Planning)</i>	Russell, T.C.C. ARIBA, ARAIA

Chisholm College

<i>Head</i>	Morrison, Professor J.D. PH D, D SC (GLAS), FAA, FRACI
<i>Bursar</i>	McVeity, M.C. AMIREE, AFAIM

Glenn College

<i>President</i>	Oates, S. BA, B ED (MELB), TPTC
<i>Secretary</i>	Bodey, N.H.

Menzies College

<i>Chairman</i>	Collins, K.G. B ED (WA), MA (ALBERTA), PH D (MICH)
<i>Manager</i>	Star, J.C.

Computer Centre

<i>Manager</i>	Edwards, J.A. BA (KEELE)
----------------	--------------------------

Language Centre

<i>Senior Lecturer</i>	Hooke, R.L.G. BA (MELB), MA (ESSEX) <i>Chairman</i>
------------------------	---

University Advisory Services

Health Service

<i>Physician-in-Charge</i>	Semmens, K. MB, BS (MELB), DTMH (LOND)
----------------------------	--

Counselling Service

<i>Counsellor</i>	Bailey, C.F. B ECON (SYD), DIP PSYCH (MELB)
-------------------	---

Careers Advisory Service

<i>Adviser</i>	Waterhouse, J.L. B COMM (MELB)
----------------	--------------------------------

INTRODUCTION

La Trobe University, which admitted its first students in March 1967, is the youngest of the three Victorian universities and, at present, the smallest in terms of student enrolments. Its 500-acre site at Bundoora, nine miles north of the City of Melbourne, was however selected with a view to its capacity to provide the space necessary for the eventual development of a large institution. To meet the State's urgent need for increased university places it was necessary to plan for a rapid growth in student enrolments in the first few years of the University's existence. From an initial enrolment of 552 in 1967, total enrolments rose to 4,304 in 1972 and are expected to reach approximately 7,500 by 1975.

The University was established when the Parliament of Victoria passed the La Trobe University Act No.7189 of 1964. The provisions of the Act were based principally on recommendations made by a committee appointed by the government in May 1964 under the chairmanship of Mr J.R.A. (now Sir Archibald) Glenn.

The University is named after Charles Joseph La Trobe (1801-1875), who was appointed as first Lieutenant-Governor of the new Colony of Victoria in 1851.

For the first two years responsibility for the planning of the new institution rested with an Interim Council. The first Council of the University took office in December 1966 and elected as Chancellor Sir Archibald Glenn who retained this office until July 1972 when he was succeeded by the Hon. Mr Justice Smithers. The University was formally opened by His Excellency the Governor of Victoria, Major-General Sir Rohan Delacombe, at a ceremony on 8 March 1967 during which Sir Archibald Glenn was installed as Chancellor by the then Premier of Victoria, Sir Henry Bolte.

The Council, which is the governing authority of the University, has 31 members including the Chancellor, the Vice-Chancellor, the deputy chairman of the Academic Board, the president of the Students' Representative Council and the Director General of Education. Of the remaining 26 members, nine are appointed by the Governor in Council, seven are co-opted by Council itself, four are elected by the Academic Board, and three are elected by students. The senior academic body, the Academic Board, has the principal responsibility of considering matters of academic policy and of making recommendations to Council where appropriate. These considerations are normally based on the advice which the Board receives from its various standing committees and from the boards of studies of the several Schools, which are the academic units into which the University is divided.

There are at present seven Schools. Of these, four (Biological Sciences, Humanities, Physical Sciences and Social Sciences) were established before the University opened in 1967. Since then two professionally oriented Schools have been added — the School of Agriculture in 1968 and the School of Education in 1970.

The department of psychology offered its first courses in 1972 and is now incorporated in the School of Behavioural Sciences which was established in 1973.

In 1974 enrolments in the seven Schools were as follows:

	Bachelor degree	Higher degree	Diploma in Education	Other	Total
Agriculture	213	23	—	3	239
Biological Sciences	473	43	—	8	524
Education	384	61	396	23	864
Humanities	1961	70	—	47	2078
Physical Sciences	511	90	—	19	620
Social Sciences	1778	98	—	40	1916
Behavioural Sciences	222	14	—	9	245
Total	5542	399	396	149	6486

The University held the first ceremony for the conferring of degrees in December 1969 when 144 graduands received their testamurs from the Chancellor and a further 28 were admitted to degrees *in absentia*. In subsequent years it has been necessary to hold two ceremonies annually for the conferring of degrees and diplomas on increasing numbers of graduands.

The staff of the University has steadily increased since 1967 to meet the needs of the growing body of students. In 1974 there were 405 full-time and 219 part-time staff directly engaged in teaching and research.

DEVELOPMENT

Commencing in 1965 with Glenn College and the first stage of the library, the University's building program up to the end of 1974 has resulted in the completion of over 100,000 square metres of building floor area.

During this time, facilities have been added to provide permanent homes for six Schools (Humanities, Education, Social Sciences, Biological Sciences, Physical Sciences and Agriculture), administration and union buildings.

Building projects completed in 1974 include four new squash courts, extensions to Menzies College, extensions to Chisholm College, physical sciences IV, biological sciences II, humanities education complex stage I, extensions to biological sciences I, extensions to the maintenance and services

depot and the third stage development of the staff and student flats at the Waterdale Road site.

Projects under the 1973/75 triennium program to be completed and occupied early in 1975 are — physical sciences II, social sciences II and staff club.

UNIVERSITY FINANCES

Most of the funds for the capital development of the University are made available by the Australian Government with additional finance being obtained from loans. Capital funds available to the University in the 1973-75 triennium are \$15,681,000.

The University was granted the sum of \$14,414,000 for recurrent expenditure in 1975. This amount is provided by the Australian Government.

While the University receives most of its funds from government grants, it nevertheless welcomes donations, bequests and loans both for general purposes and for such special purposes as the bursary fund, the students' loan fund, student housing, research into particular areas, the establishment of fellowships and scholarships and the purchase of major items of equipment.

Gifts, bequests and loans may take the form of money, land, investments, works of art, books or other property. Under existing legislation gifts of funds to the University are allowable income tax deductions, and bequests are not subject to Victorian probate duty or Federal estate duty.

A donor may make a gift or bequest without conditions, leaving the Council of the University to apply it to the best advantage of the University, or the donor may lay down conditions or specify the objects to which the gift or bequest is to be applied. The University will strictly carry out the donor's wishes. In the case of a substantial gift the University will perpetuate the donor's name.

The University will welcome short or long term loans of suitable works of art, books and scientific or other equipment for display or use. The University will insure items lent and will look to their preservation and safety.

Intending benefactors are invited to discuss the terms and conditions with the Vice-Chancellor or the Business Manager to ensure that the gifts are applied to the general or special purposes most suited to the wishes of the benefactor and the needs of the University.

A suitable form of bequest is:

*I give to La Trobe University the sum of
dollars free of all duties to be applied for the purposes of the University
either in such manner as the Council thereof may determine or in the
following manner*

*and I direct that the receipt of the Business Manager of the University
shall be a sufficient discharge to my trustee(s) for payment of that sum.*

When the manner of application is precisely specified, it is suggested that the Council be empowered to apply the gift or bequest from time to time in any manner which in the opinion of the Council is similar to or a satisfactory substitute for the specified manner.

LIBRARY

The collections and services of the library are being developed to support the teaching and research programs of the University. During the early stage in its growth emphasis has been placed on the provision of books and periodicals directly relating to the subjects being taught. In 1975 the holdings will be approximately 220,000 volumes of books and periodicals, and some 25,000 volumes will be added during the year.

The library building, which is located on the northern side of the Agora in the centre of the academic buildings, is designed to house up to 300,000 volumes and 1,600 readers. The main entry to the building is from the concourse on the second level, and on this floor most service functions are located – the public catalogues, the reference collection and reference service point, the loans desk, the reserve book collection, the microform collection and reading equipment, and offices and workrooms for the library staff. Level three houses the general collection and the main reading area, including 32 lockable carrels for the use of research students. Level one houses the serials collection with its associated display and reading areas, the serials and government documents workroom, the research collection (which includes government documents) and its reading area, and the special collections room.

A fuller description of the library and of the services it offers to students is contained in the *Library Guide*. The rules governing use of the library are set out in the University's Regulation 20.2(1) *Use of the Library*. Copies of the Guide and the regulations are available at the loans desk.

The librarians of the reference section give individual assistance to students when requested and in co-operation with the Schools give courses of instruction in library use and subject bibliography.

LANGUAGE CENTRE

Director

Mr Robert Hooke

Secretary

Mrs Margaret McCue

The language centre was established at the beginning of 1974 and aims to provide students and staff with any help relating to language matters. Courses are offered in a variety of foreign languages (these however, not being undergraduate courses), in English for overseas students, in reading improvement and in remedial English for Australian students who are having trouble with English expression. The centre also provides courses in Modern Greek and Indonesian in co-operation with the School of Education, these forming part of certain Bachelor of Education units. Translation of documents is also handled by the centre.

In addition the centre runs many courses for people outside the University community — these include evening language courses, English for overseas students sponsored through the Colombo Plan, and a variety of *ad hoc* language courses for members of Australian Government departments.

The language centre is housed on the fourth floor of the humanities building and welcomes any enquiries relating to language matters.

COMPUTER CENTRE

Manager

Mr John Edwards

Secretary

Miss Diana Sanci

The University computer centre which is situated in the north-west annexe of the south building is equipped with a DEC-System 10 computer. This is a versatile machine which provides simultaneously multi-program batch processing, real-time capabilities, and sophisticated timesharing for up to 40 remote users. A K110 processor with 196,000 words of memory combine with disc, drum and magnetic tape peripherals to make this machine currently the most powerful DEC computer in Australia.

As well as providing services for the administrative, research and teaching functions of the University, the computer centre has a major interest in interactive graphics and a PDP15 with a VT15 graphics system forms an important part of the computer network. Computer applications in the library sphere are at present being studied, and eventually many library services will be on-line to the main computer through a PDP-11.

Card punch facilities are available to cater for the requirements of batch-oriented jobs.

Service courses in programming are conducted by the centre for academic departments. Additional courses for staff and students can be arranged by contacting the secretary of the computer centre.

THE LA TROBE UNIVERSITY BOOKSHOP

The La Trobe University Bookshop is owned by the University, and is controlled by a board of management representing various interests within the University, including students.

The shop, located on the eastern side of the Agora, is open between 8.30 am and 5.30 pm Monday to Friday all the year, and till 8 pm on Thursdays during March.

It stocks all textbooks used in the many courses offered at La Trobe, as well as a good range of general books, fiction and non-fiction, and children's books. A special feature is the large selection of paperbacks and reference books. A variety of stationery, records, cassette tapes and magazines is also available.

The bookshop aims to serve the University community, but its services are available to all, inside and outside the University, who wish to make use of them. A carefully controlled credit system is available for those who wish to pay for their purchases on a monthly basis. Special orders may be placed for books not normally held in stock. A mail-order service is provided for those who find it difficult to shop personally.

The bookshop staff are always pleased to answer any enquiries about the bookshop facilities.

AGORA FACILITIES

A central feature of the campus is a shopping/recreational centre known as the Agora. The Agora is administered by the University's commercial management committee, to which members are appointed from various sections of the University community, including students.

The following facilities are provided in the Agora:

Books, records, prints, stationery	— La Trobe University Bookshop
Savings and trading banks facilities	— The Bank of New South Wales
	— The State Savings Bank of Victoria
Saving and borrowing facilities	— La Trobe University Staff Credit Co-operative Limited
Travel arrangements	— AUS Travel Service
Student staff housing	— La Trobe University Housing Company Limited, Housing Office
Service for prospective teachers	— Secondary Teachers College
Food, drinks, light refreshments	— The Union Coffee Shop
	— Qol Whole Foods Pty Ltd
	— Mrs Nemec's Delicatessen and Grocery

Pharmaceutical supplies	— Milne's Pharmacy
Hairdresser, tobacconist	— Renato of Venice
Drycleaning, Post Office	— Heidelberg Dry Cleaners Pty Ltd
Leathergoods, handcrafts etc.	— Mr P. Davies

The Union is responsible for the regulation of commercial activities on campus.

CAREERS ADVISORY SERVICE

<i>Advisers</i>	Mr John Waterhouse Mr John Goodwin
<i>Administrative Assistant</i>	Mrs Gail Birchall

The careers advisory service is located in the north-east annex of the south building.

Students are encouraged to make full use of its facilities which include a part-time and vacation employment service, an extensive careers library, and the opportunity to discuss career plans with an experienced adviser.

Choice of career, and appropriate preparation usually covers a span of some years, from schooldays, through university and in many cases beyond graduation. Careers advisers are happy to give help and advise at any stage of this process.

UNIVERSITY COUNSELLING SERVICE

<i>Counsellors</i>	Mr C.F. Bailey Mr Terry O'Neill Ms Pat Strong
<i>Secretary</i>	Ms Kathy Goode

The function of the counselling service is to offer help either individually or in groups, to students who are having such difficulties as defining their vocational goals, settling down to effective study, adjusting to life at university, or dealing with their personal problems.

The service is available with (or in urgent cases without) an appointment to staff or students of the University and to those who are interested in becoming students. Appointments can be made in person or by telephoning extension 2956, 2957 or 2958. The counselling unit is located immediately above the telephone exchange on the first floor of the north-east annex of the south building.

UNIVERSITY HEALTH SERVICE

<i>Physician in charge</i>	Dr K. Semmens
<i>Assistant Physician</i>	
<i>Part-time Physicians</i>	Dr Ruth Williams Dr Jenny Garner
<i>Nursing Sisters</i>	Miss Sue Shields Miss Wendy Judd
<i>Secretary/Receptionist</i>	

The University health service is located on level one of the north-east annex to the south building.

For students and staff the health service provides the opportunity to discuss medical problems, vaccination before overseas travel, insurance medical examinations, and first-aid care in case of accident or medical emergency on campus. Treatment for illness may be provided, or the patient may be referred to a more appropriate place for further care. Immunization against tetanus, poliomyelitis, etc., is available.

Sports injuries may be treated initially in the sports pavilion by honorary sports medicine physicians but subsequent treatment is obtained either from private physicians or from the health service. An orthopaedic surgeon may be consulted in an honorary capacity during his weekly visit to the health service. Physiotherapists attend daily, their charges being reimbursed by the Sports Union insurance company.

For students, the University health service hopes to be of use particularly where ill-health or worry is interfering with studies, and where the stresses of undergraduate life are having an effect on a student's health. It is open during normal University hours. No charges are made. Consultation by appointment. Minor conditions may be seen without appointment in casualty department between 9.30 and 12.30 pm, and 2.30 and 5 pm.

STUDENT HOUSING SERVICE

<i>Student Housing Officer</i>	Mrs Betty Collings
<i>Secretary</i>	Mrs Patricia Robinson

The student housing service is provided to assist students in finding accommodation other than in colleges, and to advise on any relevant problems such as types available, costs, suitable areas, transport, etc.

Offers of accommodation for students are visited wherever possible to ensure reasonable domestic and study facilities, and a permanent listing of available places is kept throughout the year. These vary from furnished rooms (from \$12 a week) to private board (from \$20 a week), or varying arrangements between the two, to suit a particular student's needs.

There is also a limited number of University flats available to students. These are two, three, four and five-bedroom furnished flats mostly on campus and cost approximately \$12 a week per student. General information about other flats and houses for rental in the area is provided.

Country students should allow sufficient time to locate suitable places (possibly an overnight stay in Melbourne) and private transport is invaluable when doing so.

Enquiries should be directed to the Student Accommodation Office, La Trobe University, Bundoora, 3083. Telephone 478 3122.

THE COLLEGES

The three colleges of the University each provide a number of study bedrooms for residential students. Glenn College, which has been in operation since the opening of the University in 1967, and Menzies College which opened the following year, also provide common dining, social and recreational facilities. In Chisholm College, which opened in 1972, study bedrooms are arranged in groups of 8 to 12, each group having its own kitchen and dining area where residents may prepare and eat their meals. No central catering is provided in this college and the residence fee covers the cost of room only.

Application for College Residence

In addition to the application to enrol at the University, a separate application is required for residential accommodation in either Glenn College, Menzies College or Chisholm College. Further information and application forms may be obtained by writing to the Student Accommodation Office, La Trobe University, Bundoora, Victoria 3083.

CHILDREN'S CENTRE

La Trobe University children's centre accepts children in the age range six weeks to five years for all day or part day care. There are 35 places for children under three and a half and 25 places in the kindergarten for preschool children. The kindergarten provides the usual program for two sessions a day but children can be left for the whole day.

The younger children have some organised activities along play group lines. Staff are well qualified so the centre provides care of children which is stimulating to the child's development in a happy and relaxed atmosphere.

Fees for 1974 were:

	Hour	Day	Week
Staff	\$1.00	\$4.50	\$20.00
Students	.90	4.00	17.00

	Morning Sessions	Afternoon Sessions
Staff	\$11.00	\$9.00
Students	9.00	8.00

PUBLIC TRANSPORT

Copies of bus timetables and fare concession application forms are available at the student administration branch. Buses leave the campus from the south building. For information on tram, train and bus services in the metropolitan area, ring the transport information centre on 630141. For services in the country, ring 630202.

BUS ROUTES TO THE UNIVERSITY

(*Indicates a connection with the rail and tram routes mentioned below):

Melbourne and Metropolitan Tramways Board Route

City – Russell Street (terminus at Bourke Street), Rathdowne Street (Exhibition Buildings), North Carlton, North Fitzroy, Clifton Hill, Dennis*, Northcote, Fairfield, Ivanhoe, West Heidelberg, La Trobe University.

Ivanhoe Bus Company Route

Deepdene (Burke Road tram terminus), Ivanhoe railway station*, Heidelberg Repatriation Hospital, West Heidelberg, La Trobe University.

Dyson's Bus Service Routes

(1) Regent railway station* or Northland, East Preston tram terminus*, La Trobe University, Janefield.

(2) Regent railway station* or Northland, East Preston tram terminus*, La Trobe University, Greensborough railway station*.

(3) Regent railway station* or Northland, East Preston tram terminus*, La Trobe University, Watsonia railway station*, North Watsonia.

The majority of Dyson's services do not enter the campus.

Mees' Bus Lines Route

East Rosanna (corner of Graham and Warren roads), Macleod railway station*, La Trobe University. One bus only to La Trobe University arriving at 8.45 am.

RAIL

(1) Princes Bridge to Heidelberg and Hurstbridge railway line. Bus services depart from Ivanhoe, Macleod, Watsonia and Greensborough railway stations for La Trobe University.

(2) Princes Bridge to Reservoir and Epping railway line. Buses link Regent railway station with La Trobe University.

TRAM

Bourke Street to East Preston tram line. Buses link the East Preston tram terminus with La Trobe University.

SPORTS UNION

The La Trobe University Sports Union was established in 1967 to assist and co-ordinate the establishment and administration of the various sporting clubs. The Sports Union Council consists of a delegate from each club. The Sports Union executive committee, elected from Sports Union Council members, administers, through the executive secretary, the Sports Union. Its offices are located in the indoor sports centre which is to the north east of Glenn College.

Facilities are available for recreational and competitive sporting activities. A sports pavilion and playing fields, tennis courts and an indoor sports centre have been established. Six squash courts are available and an indoor field house, 80 feet by 100 feet is suitable for a wide range of activities. The indoor sports centre is open from 8 am to 11 pm on week days, 9 am to 1 pm on Saturdays and 9 am to 1 pm on Sundays.

Various recreational activities are available and enquiries should be made at the office.

Staff may join the Sports Union upon application. All members are covered by accident insurance whilst participating in authorised activity.

A wide variety of sporting clubs are functioning and the following are available to members of the Sports Union: aikido, athletics, Australian rules football, badminton, baseball, basketball (mens international rules), basketball (womens international rules), boxing, canoeing, cricket, equestrian, fencing, golf, hockey (mens), hockey (womens), judo, karate, lacrosse, lawn tennis, mountaineering, netball, rowing, rugby, skiing, sky-diving, soccer, softball, squash, sub-aqua surf-riding, swimming, table tennis, tae kwon do, volleyball, weightlifting and yachting. Clubs enter teams in inter-varsity, intra-varsity and local competitions. The Sports Union also provides recreational sessions for those wishing to take part in a variety of activities on a 'drop-in-and-have-a-go' basis.

STUDENTS REPRESENTATIVE COUNCIL

The SRC consists of 19 members elected by and from all students (full-time, part-time, postgraduate and undergraduate) and exists to 'represent the students of the University on all matters affecting their interests',

The staff consists of an administrative secretary/accountant, two administrative assistants and two typists. Offices are situated in the union building.

A general election is held annually within the first four weeks of second term. The majority of the 19 SRC members are elected by the SRC to hold portfolios. They are at present: president, vice-president, treasurer, assistant treasurer, secretary, race relations officer and chairpeople of the following committees: academic affairs, activities, AUS, education, AUS F7, AUS other, clubs and societies, environment, public affairs, publications, student welfare, women's affairs.

The SRC has in the past promoted the social, cultural and intellectual life of the University through such activities as balls, forums and guest speakers, by the organization of orientation, by supporting more than 50 clubs and societies and by publishing a newspaper, *Rabelais*, and a weekly newsletter, *SRC News*.

The present SRC is continuing to promote all of the above, but as well, hopes to be able to help in unravelling some of the inconsistencies of our society by attempting to raise consciousness both on the University campus and outside in the community. The SRC is available to all students and it trusts that anyone who is having hassles will use the SRC for support.

The SRC hopes that students will involve themselves with areas of interest other than academic performance so that they will graduate from this University with a realisation of the present social situation and not merely with the piece of paper termed a 'degree'.

The SRC is affiliated with the Australian Union of Students.

Clubs and Societies

Extra-curricula activities comprise an important part of a student's university experience and to accommodate these interests, students have formed clubs and registered with the SRC as an affiliated club. Clubs and societies are able to offer their members facilities to enjoy and further their activities.

The following clubs and societies are registered with the SRC and may be contacted through the SRC office in the Union:

African freedom group, Agape, agriculture students, anarchists, anti-foreign bases action committee, apathy league, arts co-op, Asian students association, association for the international exchange of students in economics and commerce, association of tobacco chewers and body painters, ballroom dancing, chemical society, chess club, China society, christian union, commune, communist club, conservation society, contemporary dance group, democratic club, draft resisters union, drama group, ecological society, film production

group, folk club, four wheel drive, French arts group, geological society, hellenic club, historical association, horseless carriage society, Italian society, Jewish students society, labour club, liberal club, literary society, marijuana action group, Mataungan film makers, M.F. 15 Janefield project, moat theatre, moderate student alliance, motorcycle association, music society, Papua New Guinea society, philosophy society, photographic society, physics society, prisoners' action group, progressive experimental, student theatre, progressive film group, psychological society, radical feminists, radical students movement, returned school leavers, revolutionary communists club, self soarers association, sociology society, social responsibility in science, spartacists club, strawberry, vegetarian society, womens action abortion group, Yoga society.

Rabelais

Rabelais is the student newspaper which is financed by the SRC. The editorial structure in 1974 consisted of a board of editors and occasional help from whomever was interested.

Rabelais is based principally upon the contributing of articles by students and is therefore the voice of the student body reflecting student interests. As the students have been concerned with opening up the University and breaking down the ivory towers, hence *Rabelais* is, to a large degree, externally oriented in content.

As a link in the chain of alternative media, *Rabelais* is now being sent interstate and overseas.

THE UNION

The term *Union* goes back to Cambridge and Oxford where groups of students united to form debating clubs or debating unions. Facilities such as lounges, coffee rooms, toilets, naturally were necessary. Modern unions are designed as social, cultural and recreational centres within universities.

La Trobe University's Union is a student-staff union. All students are automatically members. Staff may join voluntarily. The Union provides catering services in the dining room, grill room and snack bar of the union building, and in the union coffee shop located in the Agora. Between 12.00 midday and 12.00 midnight in the union building members can drink their own liquor as there is a BYO permit.

Union services to members include a listening library, billiards, table tennis, cards, chess and television. Rooms are available free to members to hold meetings or functions. Showers, changing rooms, towels, shavers, hair dryers and typewriters are available and your printing needs are organised. There is a daily news sheet, *Ratsheet*, which carries your advertisements.

An activities committee organises cultural activities and entertainment of a wide variety. Each term it runs workshops covering areas such as stained glass to motor mechanics. Be involved, or just for information visit the activities office.

Contact-enquiries: For all information, enquiries and help do use the contact service. It is run jointly by the SRC and Union, and is serviced by student volunteers and permanent staff.

Negotiations are continuing for a liquor licence, a Union-run petrol station on campus, extensions to the present building and extensions to the Union coffee shop in the Agora.

The Union Board is responsible for Union policy. The president and eight Board members are elected by all the members at the end of first term each year. University Council appoints two members to the Board.

Any personal enquiries about the Union should be made to the contact-enquiries office (next to the dining room). Correspondence should be addressed to the secretary-manager, Mr Arthur Hayes.

COMMONWEALTH TERTIARY EDUCATION ASSISTANCE SCHEME

The Tertiary Allowances Scheme (TAS), first introduced in 1974, has been renamed the Tertiary Education Assistance Scheme (TEAS). TEAS provides means-tested living and other allowances to full-time, non-bonded Australian students admitted to or continuing approved university courses.

ELIGIBILITY

Open to *full-time* students who are Australian citizens, permanent residents of Australia, who have been granted permanent entry permits or who have applied for and are likely to be granted permanent resident status, and, who, in addition

- (1) are entering an approved university course to commence a first tertiary qualification, or
- (2) have satisfactorily completed in two years of part-time study the workload required of a full-time student in one year of study, or
- (3) have attempted one full-time year of an approved course for a first qualification provided they have passed at least half of the normal full-time workload in the year in which study was undertaken, or
- (4) have passed at least half of the normal full-time workload in the second or later years of the course.

A student whose total progress in his course falls more than half a year's work behind the point that a student undertaking the prescribed workload successfully should have reached, is not eligible for assistance.

Benefits normally will be limited to the minimum number of years of any approved course. Students transferring to another course of their own accord will be ineligible for benefits until attaining a similar state in the new course.

Students who have completed a first degree or who plan to undertake a special course may be eligible under certain circumstances.

Approved university courses include undergraduate and postgraduate Bachelor-degree courses, postgraduate diplomas, approved combined Bachelor-degree courses and Master's qualifying courses.

BENEFITS

Means-tested Living Allowance

Allowances will be paid on a graduated scale, the maximum allowance being \$1,000 a year for students living at home and \$1,600 a year for students living away from home under approved circumstances.

The maximum allowance is payable where the family's adjusted income is \$6,300 a year or less and some allowance is payable on a reducing scale for family incomes above \$6,300. For married and qualified, single independent students (including orphans and wards of the State), the means test is applied to the student's income and, where applicable, the spouse's income.

Incidentals Allowances

All students qualifying for a living allowance will receive \$100 to cover the general service fee, books and equipment.

Dependents' Allowance

A married student qualifying for a living allowance may receive an allowance of \$10 a week for a dependent spouse and \$6 a week for each dependent child.

Travel Allowance

Students, qualifying for a living allowance, who are living away from their normal places of residence in order to undertake their courses of study, may be reimbursed the costs of three return trips a year between their homes and the University.

APPLICATIONS

Application forms and information booklets may be obtained from all secondary, technical, matriculation and tertiary institutions and from the Department of Education. Applications for assistance in 1975 may be submitted to the Department of Education at anytime during 1975.

Students receiving the Tertiary Allowances Scheme in 1974 must reapply in 1975 in order to receive benefits, and will receive application forms directly from the Department of Education.

Further information may be obtained from the Regional Director, Department of Education, 450 St. Kilda Road, Melbourne, Vic. 3004.

LA TROBE UNIVERSITY RESEARCH SCHOLARSHIPS

A number of research scholarships will be awarded in 1975, tenable at La Trobe University.

ELIGIBILITY

Applicants are expected to have graduated with first-class or upper second-class honours, or equivalent qualifications, from a recognized university. Final-year students are eligible to apply. An applicant who already holds the degree of Ph D, conferred either in Australia or elsewhere, will not be granted a scholarship.

RESEARCH

The purpose of the scholarship is to assist scholars to carry out under supervision, a program of full-time advanced study and research, in a field approved by the University, leading to one of the following higher degrees: Master of Agricultural Science, Master of Arts, Master of Economics, Master of Education, Master of Science or Doctor of Philosophy.

In allocating scholarships, account will be taken of the suitability of the proposed research project in terms of the supervision and facilities available in the particular discipline.

TENURE

Scholarships are tenable as follows:

Masters candidates — up to a maximum period of two years.

Ph D candidates:

- (1) Normally up to a maximum period of three years. (Only when exceptional academic circumstances have arisen is it possible to extend a scholarship beyond three years. Such extension will be for the period necessitated by the circumstances of the particular case and will not exceed 6 months.)
- (2) If a Master's degree candidate is granted approval to upgrade his candidature to Ph D, his award may be extended to three years.

The scholarship is tenable in the first instance from the date of beginning work at the University, usually 1 March, until 31 December of the same year, but is renewable on 1 January each year, subject to satisfactory progress up to the maximum period shown above.

The scholarship may be terminated at any time by the research committee should the scholarship holder fail to pursue a program of full-time study and research.

STIPEND

Stipends for scholarships will be paid at the rate of \$3,000 a year. Stipends are exempt from income tax.

OTHER ALLOWANCES (under review)

The following special allowances may be claimed:

- (1) Married scholar with dependent wife and one child, \$500 a year;
- (2) For each additional child to a total of three in all, \$100 a year;
- (3) In special circumstances consideration may be given by the University to granting assistance to married scholars without children, up to \$300 a year;
- (4) The University may give consideration to the granting of assistance in special cases other than those specified above, e.g. for a married woman scholar with a child and dependent husband;
- (5) Exemption from compulsory University fees;
- (6) Thesis allowance, up to \$100.

(Where two theses are submitted, Master followed by Ph D, two claims may be made but the total will not exceed \$100.)

ADDITIONAL UNIVERSITY WORK

Scholars will be regarded as full-time research students, but may be allowed to undertake teaching duties provided that such duties do not interfere with a scholar's study program. Generally such duties may not exceed six hours a week or 180 hours in a calendar year (this includes the time required for preparation and marking).

APPLICATIONS

Applications for a La Trobe University research scholarship should be made on the appropriate application forms available from the University.

Completed applications forms should be lodged with the graduate studies officer not later than 31 October.

COMMONWEALTH POSTGRADUATE AWARDS

RESEARCH AWARDS

Each year the Australian Government makes available a number of postgraduate awards which are allocated amongst the universities by the Department of Education.

Applicants must have permanent resident status in Australia.

Applicants should be under 35 years of age and should have graduated or expect to graduate with at least upper division second-class honours in their bachelor degree courses or possess equivalent qualifications.

The maximum tenure of awards is two years for students proceeding to a Master's degree and three years for students proceeding to a doctorate.

The stipend is \$3,250 a year, plus \$520 a year for a dependent spouse, \$832 a year for a dependent spouse and first child and \$312 a year for each other child. In addition to the stipend, travelling, settling in and thesis allowance will be paid.

Applications for a Commonwealth postgraduate research award should be made on the appropriate application form available from the University. Applications should be lodged with the graduate studies officer not later than 31 October.

COURSE AWARDS

Special awards are offered by the Australian Government for students wishing to undertake full-time postgraduate study leading to a Master's degree by course work.

Applicants must have permanent resident status in Australia.

Applicants must be under 45 years of age and should have an undergraduate record at better than pass level. In general applicants should not have a break in their studies of more than ten years from the year of graduation. Preference will be given to applicants who have relevant employment experience.

Award benefits are continued for the duration of the scholar's course, subject to satisfactory progress. Scholars are expected to complete their courses in the minimum time.

The stipend and allowances are the same as for Commonwealth postgraduate research awards.

Applications for a Commonwealth postgraduate course award should be made on the appropriate form available from the University.

Applications close with the graduate studies officer on 30 September.

EDUCATION DEPARTMENT STUDENTSHIPS

Education Department studentships are available for approved courses for a degree and diploma in education. They are available to students in all Schools at La Trobe University and are awarded to be taken up at the beginning of any year of the course. Studentships are for full-time study only and are for the minimum period required to complete the course. In certain circumstances suspensions for one or possibly two years without an allowance are permitted to enable a student to make up failed units.

The studentship may be extended to include the fourth year of an honours degree. Suspensions are also granted without an allowance for students able to proceed to a Masters degree and/or Ph D.

Benefits

The award pays tuition fees and an allowance of \$1785 a year for first-year students, rising to \$2331 in the fourth year, with \$100 additional for those living away from home. For undergraduate and graduate entrants the allowances are:

completed first year	\$2279	—	\$2814
completed second year	\$3171	—	\$3497

completed third year \$4064 — \$4200

completed degree \$4800

Separate rates apply for those with dependants.

In addition, the award constitutes appointment into the State teaching service with an assured position as a permanent teacher after qualifying for the Diploma in Education.

A student who accepts a studentship is required to enter into an agreement which requires service with the Education Department for three years after completing the course, or one year in the case of graduate awards.

Further information is available from the principal, teachers' centre, La Trobe University or from the recruitment officer, Education Department, 480 Collins Street Melbourne (telephone 62 0711 extn 363).

STUDENT LOANS

The students' loan fund committee offers loan assistance to enrolled students under three loan programs. In all cases, a student must submit an application form outlining the nature of his financial need and provide an acceptable guarantor for the loan. It is the committee's policy that a loan should supplement other income and not serve as a student's sole source of funds.

Medium and Long-Term Loans are available to assist students whose financial difficulties are considerable and who require loans to enable them to pay general service fees, purchase prescribed books and equipment and provide essential living expenses, including child-care costs. These loans may also be approved to provide temporary assistance to students awaiting the Tertiary Education Assistance Scheme. A loan cannot be made to assist a student with the purchase or repair of a motor vehicle. Preference is given to later-year students to enable them to complete their degree.

The maximum amount which the committee will advance to a student is \$850 during one academic year, and not more than \$1700 during a course. When approving a loan application the committee specifies the period within which the loan must be repaid. In setting this period the committee takes into account a student's overall financial position and the amount of the loan. Long term loans must be repaid within two years of the completion of a course or withdrawal from the University, whichever is earlier. Medium term loans must be repaid by the first day of first term of the year following the year in which the loan was approved. Interest is charged only on loans which are not repaid by the due date.

The committee may recommend to the Bank of New South Wales that it

grant a supplementary loan. Interest is charged on the bank loan at a concessional rate.

Short Term Loans, up to a maximum of \$100, may be made available on an immediate basis to students who are experiencing temporary financial difficulties. These loans must be repaid within two months and are interest-free if they are repaid by the due date.

Travel Loans, up to a maximum of \$300, may be approved to assist students in meeting the costs of travel during term breaks and the summer vacation period. Because travel loan funds are limited, preference will be given to applicants who propose education-related travel, demonstrate thorough and realistic plans, and can document that their financial resources, with loan support, are adequate to meet the costs of their trip. Travel loans are interest-free if they are repaid by the due date.

The committee may recommend to the Bank of New South Wales that it grant a supplementary loan. Interest is charged on the bank loan at a concessional rate.

Enquiries regarding all types of student loans should be directed to the students' loan fund officer, Registrar's department, extension 2112.

Information regarding loans and other forms of undergraduate financial assistance is posted regularly on the east bulletin board in the student administration branch.

PART II ADMINISTRATIVE PROCEDURES

The student administration branch in the Registrar's department maintains details of individual student enrolments and any variations thereto, publishes the official class and examination timetables, makes appropriate arrangements for the conduct of examinations and publication of results and compiles a full record of each student's academic progress. Students are invited to call at the branch for information on all aspects of their enrolment and progress and for general information on a variety of matters such as the Tertiary Education Allowance Scheme (TEAS), transport timetables and travel concessions. The student administration branch is located on level 2 of the south building and is open from 9 am to 5 pm, Monday to Friday.

Other queries may be directed to the appropriate student advisory service: health service, counselling service, careers advisory service, student housing service; or to an adviser of studies. Refer to the index for details.

ENTRANCE REQUIREMENTS

A prospective student must satisfy or be exempt from the university entrance requirements specified by the Victorian Universities and Schools Examination Board. The normal entrance requirement is grade D or higher in at least four higher school certificate examination subjects, including English, obtained at one sitting.

In addition to the above normal entrance requirement for university entrance there are two other ways of satisfying entrance requirements. One method applies to persons who sit for the HSC examination whilst in full-time employment in Victoria; the other method applies to persons who are not less than 25 years of age in the year in which they attempt HSC subjects. Particulars of these special categories are set out in the VUSEB handbook obtainable from the secretary, VUSEB, 437 St. Kilda Road, Melbourne 3004.

In exceptional circumstances consideration may be given to a person seeking entry to the university who has not passed the English paper in the higher school certificate examination but has obtained meritorious results in other subjects in that examination, and has satisfied any prerequisite subjects specified for the School in which he or she wishes to enrol. Enquiries in the first instance should be directed to the admissions officer, telephone 478 3122 (extension 2738).

Attention is drawn to the prerequisites for entry to certain Schools and courses detailed under the Schools and Disciplines sections of this handbook.

COURSE PREREQUISITES 1975

Prerequisite subjects must be at grade D or higher at the Victorian higher school certificate examination or an acceptable equivalent unless otherwise stated. There is no minimum age requirement at La Trobe.

Agriculture: Chemistry and either physics or a branch of mathematics. Exceptions may be made in special cases. Diplomates from Dookie and Longerenong agricultural colleges or Burnley Horticultural College will be considered for selection but should seek an interview with the Dean or an adviser of studies before applying.

Behavioural Sciences: There are no special course prerequisites for admission to the Bachelor of Behavioural Science degree. However students intending to include science subjects in their degree are required to meet the subject prerequisites laid down by the science Schools.

Biological Sciences: Chemistry and at least one subject out of: physics, biology and any mathematics subject.

Education: Students are not admitted to first year. A student may enrol for education subjects either after completion of the first academic year in another School of the University or after the completion of a degree.

Humanities: There are no special course prerequisites.

Physical Sciences: *Either* two out of chemistry, physics, pure mathematics and applied mathematics; *Or* general mathematics and either chemistry or physics. Exceptions might be made for students who obtain very high marks in the examination as a whole.

Social Sciences: There are no special course prerequisites.

HOW TO APPLY

Application forms (form A) have been distributed to all Victorian secondary schools presenting candidates for the higher school certificate examinations.

A prospective student who is not attending a Victorian secondary school may obtain the appropriate form (form B) from the secretary, Victorian Universities Admissions Committee, 11 Queens Road, Melbourne 3004.

All applications close on 1 November 1974.

ADMISSIONS ADVICE

An applicant who seeks advice should contact in the first instance the Admissions Office (telephone 478 3122, extension 2738).

OFFER OF A PLACE

Offers are made through VUAC and will include details of dates on which prospective students should attend for interview and to complete the enrolment procedure.

ENROLMENT PROCEDURE

NEW STUDENTS (other than postgraduates)

Upon receipt of an offer which is to be accepted a prospective student should attend on the prescribed date to:

- (1) discuss the proposed course with an adviser of studies;
- (2) complete the registration of enrolment and other associated forms;
- (3) pay the general service fee;
- (4) have a photograph taken for a student card.

CONTINUING STUDENTS (other than postgraduates)

A student who wishes to continue in 1975 a course commenced in any School except Agriculture must seek an interview with an adviser of studies. Details of arrangements for interviews will be posted on the official notice board during October and sent to each student enrolled in 1974 and any other person previously enrolled who has secured permission to re-enrol in 1975.

Completion of the enrolment procedure requires that the following action be taken:

- (1) submission of the prescribed forms through the office of an adviser of studies;
- (2) payment of the annual general service fee by the end of the first week of first term;
- (3) notification of a residential address for official correspondence by the same date;
- (4) presentation of the student card to student administration branch for updating.

An application for re-enrolment may be rejected if there are any outstanding debts, including fees, from the previous year of enrolment.

A late enrolment charge of \$10 will be imposed if a continuing student fails to complete the re-enrolment procedure by the prescribed date.

POSTGRADUATES (and Masters Preliminary)

(1) Admission to a Course

Details of the application procedure and the appropriate forms are available from the Graduate Studies officer (level 3, centre, south building). An applicant who is accepted as a candidate will be advised of the enrolment procedure in a letter notifying the approval and terms of candidature.

(2) Continuing Enrolment

A student who is expected to continue a candidature in 1975 will be sent enrolment papers, by post, in December 1974. A late enrolment charge of \$10 will be imposed if the procedure is not completed by the prescribed date.

RESERVED PLACE – NEW STUDENTS

A student who has received an offer and:

- (a) wishes to defer entry to the University for a year or,
- (b) has completed the enrolment formalities and decides, before the end of the fourth week of first term, that entry should be deferred for a year, should complete and lodge an *Application for a Reserved Place*.

DEFERRED RE-ENROLMENT

A student, attending in 1974, and who wishes to defer re-enrolment beyond 1975 should complete an *Application for Deferment*.

Such an application may be made:

- (1) before release of examination results, in which case the application will not be processed until examination results are known;
- (2) before re-enrolment formalities have been completed, but after examination results are available;
- (3) after re-enrolment formalities have been completed but no later than the end of the first week of first term.

COMPLEMENTARY COURSE ENROLMENTS

A student may be allowed to take a subject at the University of Melbourne or Monash University concurrently with his enrolment at La Trobe University. This is known as a complementary course enrolment.

A student enrolling for a complementary course will normally be required to pay the annual general service fee appropriate to La Trobe University and will be exempt from payment of any fees at the other university. Enquiries should be directed to the student administration branch (extension 2062). A form *Application for Enrolment in a Complementary Course* must be completed and endorsed by an adviser of studies.

TRANSFER FROM ONE SCHOOL TO ANOTHER

NEW STUDENTS – TRANSFER OF AN OFFER

A student who has received an offer in one School within the University may apply for transfer to another School. This may be done during the initial interview at the enrolment centre by discussion with an adviser of studies in the School to which the transfer is sought. In some instances the

transfer will be approved immediately and the student must complete the normal enrolment procedure in the new School. In other cases the student must complete an *Application to Transfer an Offer* and this will be considered by the appropriate selection committee. The student will be advised of the decision and invited to complete the enrolment procedure for the new School if the application is successful.

CONTINUING STUDENTS

A re-enrolling student who seeks to transfer from one School to another within the University should seek an interview with an adviser of studies in the School to which the transfer is required. An *Application to Transfer to another School within the University* should be completed together with a re-enrolment procedure in the new School. In some instances the transfer application may be immediately approved. Otherwise the student will be subsequently advised of the result of his application and of any further action required to be taken.

VARIATION OF ENROLMENT

An accepted enrolment may be varied by the deletion of a subject (or subjects) and the inclusion of another subject (or subjects) or alteration of a course. A variation of an enrolment will be accepted until the end of the fourth week of first term. A form *Variation/Withdrawal of Enrolment – 1975* must be completed, approved by an adviser of studies, and lodged with student administration branch. The approval of the Dean of the School is required if a variation, relating to the substitution of one subject for another, is lodged after the fourth week of first term.

WITHDRAWAL OF ENROLMENT

NEW STUDENTS Withdrawal of acceptance of an offer (prior to end of fourth week of first term)

Should a new student who has already enrolled receive, and wish to accept, a later offer from:

- (a) another School within this University, or
- (b) another tertiary institution

or decide not to proceed with an offer already accepted at this University, a form *Withdrawal of Acceptance of an Offer* obtainable from student administration branch, should be completed and lodged with that branch.

The withdrawal is valid only if lodged before the end of the fourth week of first term. If a form is lodged after this date suitable evidence may be required to indicate that the student has not attended at all or has not attended since the end of the fourth week of first term.

NEW STUDENTS After fourth week of first term

CONTINUING STUDENTS After first week of first term

A student may apply to withdraw an enrolment by completing a *Variation/Withdrawal of Enrolment* – 1975 form which is available from advisers of studies or student administration branch. Whilst not obligatory, it is suggested that a withdrawal should be discussed with an adviser of studies.

A withdrawal is not effective until the end of the week in which the form is received at student administration branch. Informal discussion with members of staff does not constitute an effective withdrawal. The student card must also be surrendered. A withdrawal will be recorded as a failure at the discretion of the chairman of examiners for that subject if the department concerned has already offered the major part (normally two-thirds) of the content of the subject.

A student may submit reasons in support of a request that a withdrawal in a subject be not counted as a failure.

PERMISSION TO RE-ENROL – ALL STUDENTS

An application for permission to re-enrol in a subsequent year may be lodged by:

- (a) a new student who completes a withdrawal of enrolment after the end of the fourth week of first term, or,
- (b) a continuing student who completes a withdrawal of enrolment after the end of the first week of first term.

A form for this purpose is available at student administration branch. The decision of the Dean of the School will be advised by mail. Should the application not be approved the student is given the option of reviving his enrolment.

RESIDENTIAL ADDRESS FOR OFFICIAL CORRESPONDENCE

The University requires a current residential address for official correspondence. An address such as 'C/- PO Box' is not acceptable; a non-resident student may not specify a La Trobe University college address or C/- a University department.

A change of this address must be submitted to the student administration branch on a *Change of Address* form. A student must also submit his student card at this time so that the address on the jacket may be altered.

STUDENT CARD

Each student will be issued with a student card. The card is issued during the first year of enrolment and updated for each year that the student enrolls

at the University. It is part of the registration procedure for a photograph to be taken during the first year; the student card is a by-product of this process.

The card must be returned to the student administration branch for amendment if a student changes his address. If the card is lost, the loss should be reported to the student administration branch without delay. A new card may be obtained on payment of a charge of \$1. A damaged jacket will normally be replaced free of charge. Without a current student card a student may not be permitted to use the University library or the Union.

OFFICIAL NOTICE BOARD

The official notice board is located on the second level of the south building; it is in two sections outside the student administration branch. Students are advised to inspect the official notice board at least once every week of each term. Annual examination results (pass grades only) are posted on the official notice board.

GENERAL SERVICE FEE

A general service fee is payable by all students enrolled in the University. The fee for 1975 will be \$84 (full time) and \$64 (part time).

A student enrolling for the first time in 1975 will also be required to pay a Union joining fee of \$20 (full time) and \$15 (part time).

REFUND OF GENERAL SERVICE FEE

A student enrolled in the University for the first time who withdraws before the end of the fourth week of first term may receive a refund of the fees paid. A student previously enrolled in the University who withdraws before the end of the first week of first term may receive a refund of the fees paid.

Note: A refund will not be made until the student card has been returned.

EXAMINATIONS

A student may present for examinations only in subjects for which an effective enrolment has been maintained and where progress during the year has been considered satisfactory by the department concerned. It is most important that student administration branch be advised of any change in enrolment immediately such change takes place.

EXAMINATION TIMETABLE

A provisional annual examination timetable will be placed on the official

notice board towards the end of second term. Students should study the timetable and advise should any clashes occur. A form for this purpose is available at student administration branch and must be lodged as soon as possible after the publication of the provisional timetable.

The final annual examination timetable is released towards the end of September when copies may be obtained from student administration branch, the Library or College offices.

Departments will advise students of times and venues for examinations to be held other than during the annual examination period.

SPECIAL CONSIDERATION FOR ILLNESS OR OTHER DISABILITY

A student who considers that his performance in examinations or course work has been or will be impaired by illness or other cause may seek special consideration by submitting an application together with appropriate medical evidence and/or other supporting statements. It is desirable that a disability be reported as soon as possible after its occurrence. Forms are available at student administration branch.

EXAMINATION GRADES AND RESULTS

The pass grades adopted by the University for the final assessment of each undergraduate pass or honours subject are: A: 80 to 100 per cent. B: 70 to 79 per cent. C: 60 to 69 per cent. D: 50 to 59 per cent. P: ungraded pass. NC: pass conceded.

The final assessment of honours-year work may be one of: H1: first-class honours. 2A second-class honours, division A. 2B: second-class honours, division B. H3: third-class honours.

In certain cases an aegrotat pass may be awarded. This is indicated by an asterisk immediately following the grade — e.g. D*. Other grades are detailed in memoranda of results.

Annual examination results (pass grades only) are posted on the official notice board. Memoranda of results are normally available at student administration about mid-December. Those memoranda not collected within seven days are posted to students' residential address for official correspondence. It is important that any change of address from that which has been recorded during the year should be advised to student administration.

CLASS TIMETABLE

Copies of the timetable will be available at the several re-enrolment and enrolment centres.

The timetable should be consulted before seeking approval of the proposed enrolment.

Amendments to the timetable are posted on the official notice board (level two, south building)

TRANSCRIPT OF AN ACADEMIC RECORD

Application for an academic record should be made at student administration. The cost is \$1.00 for the first copy and 20 cents for each additional copy. In normal circumstances academic records may be collected twenty-four hours after the application is lodged. Mail requests may be made and should include the appropriate remittance.

GRADUATION – CONFERRING OF DEGREES AND DIPLOMAS

A student entitled to have a degree or diploma conferred is required to complete a form *Conferring of an Award* which is available at student administration. The student may nominate intention to attend the graduation ceremony or to have the award conferred *in absentia*. All Diploma in Education awards are conferred *in absentia*.

A student who has met the requirements of a particular degree or diploma shall not be entitled to have that degree or diploma conferred unless:

- (a) all prescribed fees for the course have been paid, or arrangements satisfactory to the University have been made regarding such payment;
- (b) fines and impositions, if any, due by the student have been paid in full; and
- (c) any other financial obligations to the University have been met.

ARMORIAL BEARINGS



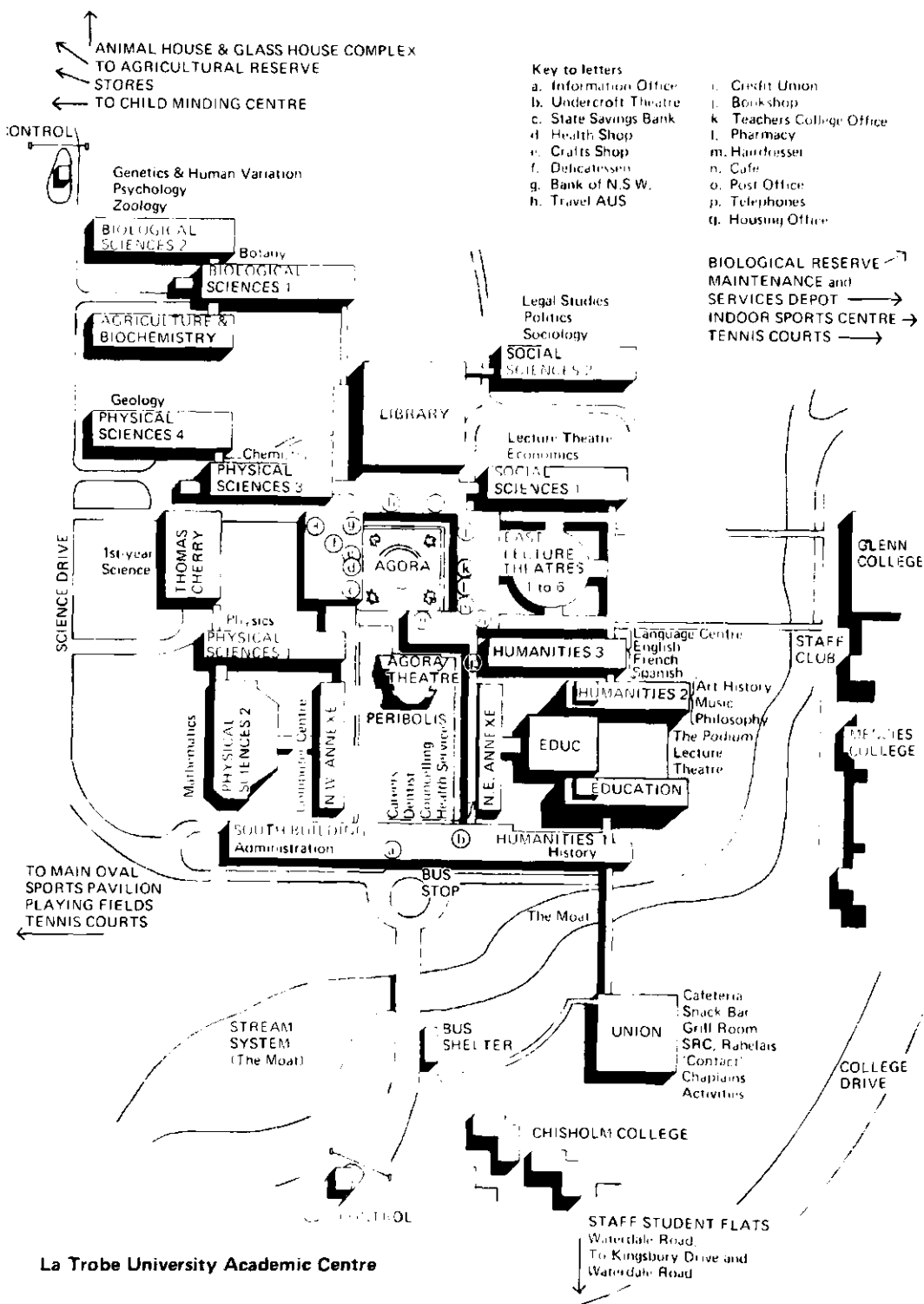
The official description of the University's armorial bearings is 'For the Arms, Argent, a chaplet of common heath proper tied azure and circling in chief a Book expanded also proper leathered Gules, over all on a fesse of the last three Escallops Silver, and for the Crest on a Wreath Argent and Gules a Parchment Scroll perched thereon an Australian Wedgetailed Eagle, wings addorsed and inverted proper, the dexter claw supporting an Escallop of the Arms. The Mantling is Gules doubled Argent and the Motto — "Qui cherche trouve" '.

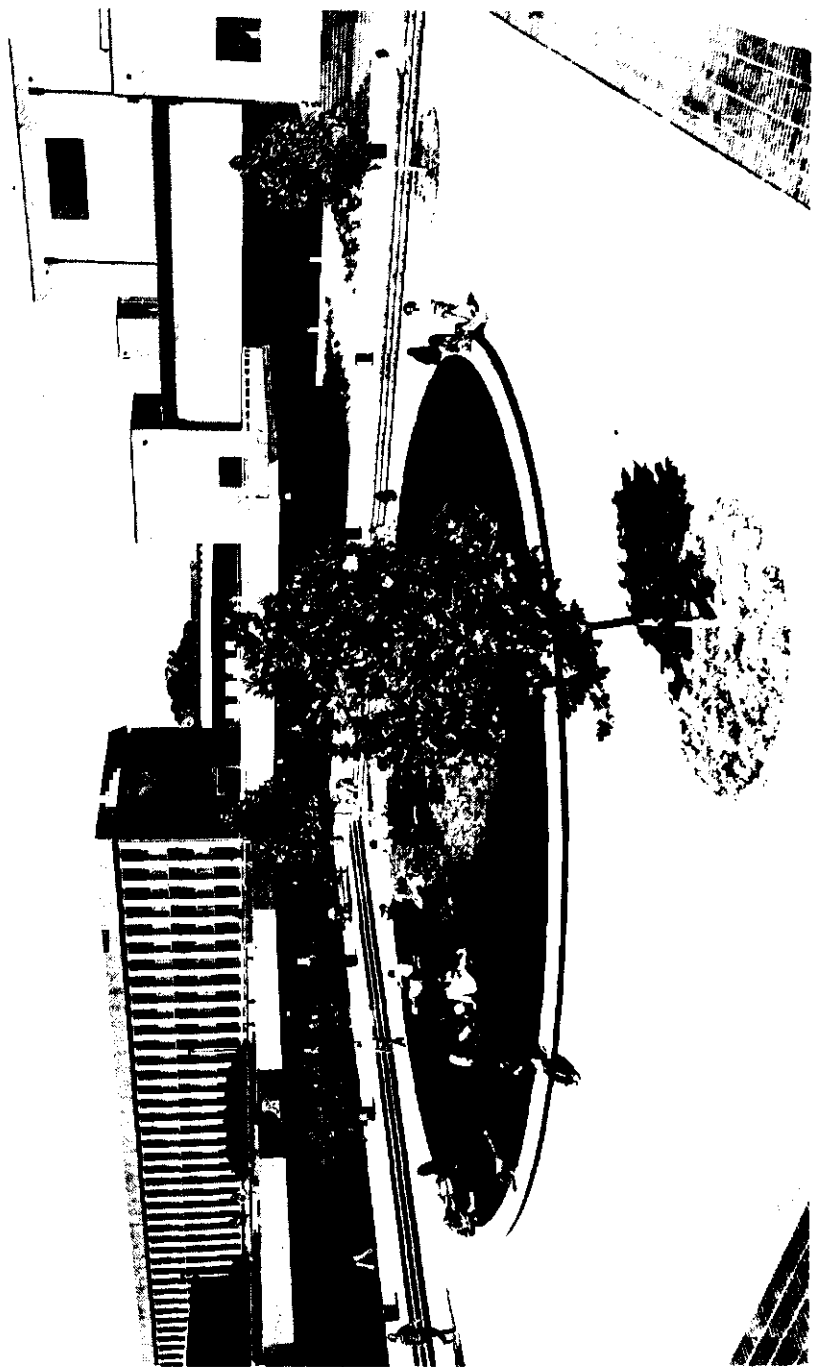
Australia is represented by the wedge-tailed eagle and Victoria by the sprigs of heath, the State's floral emblem. The open book symbolises learning and the scallop shells, which symbolise pilgrimages, are a reference to the armorial bearings of the La Trobe family.

The French motto 'Qui cherche trouve' (He who seeks will find) is a modern version of the La Trobe family motto.

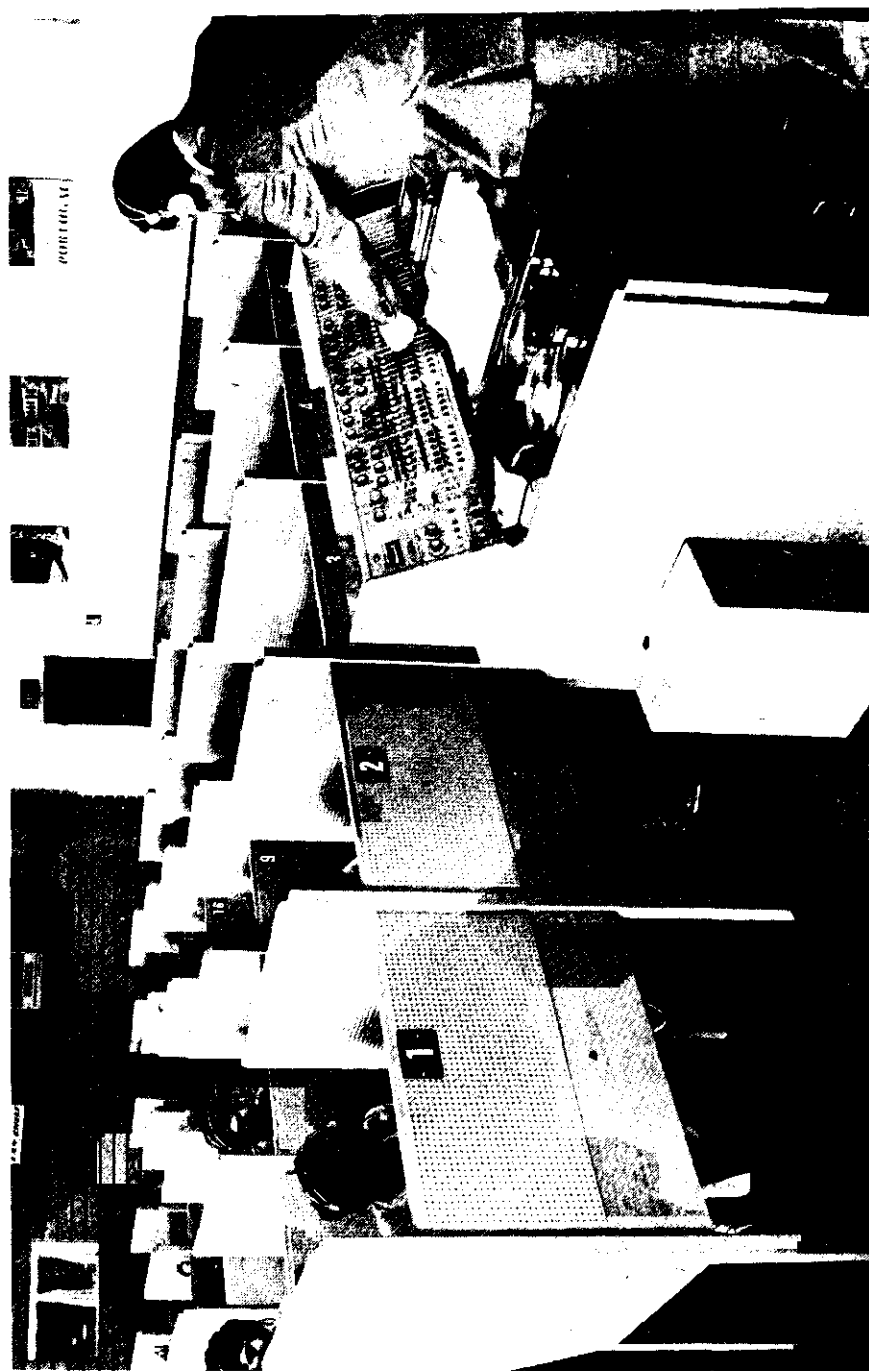


Aerial Photograph





The Agora



Language Laboratory



Film Making in the Media Centre



Glenn and Menzies Colleges

PART III SCHOOL OF AGRICULTURE

DETAILS OF COURSES

The course in agricultural science is designed to encourage in the student a basic understanding of the relations between the soil, the plant, the animal and the environment. It should be emphasized that the degree is in agricultural science, not in agriculture. Agriculture is not only an important component of our environment, it reacts with and affects the non-agricultural components. The emphasis in the course is therefore on the science relevant to an understanding of the rural environment. Substantial emphasis is also given to the study of economic and social aspects of agriculture and farm management.

The biology part of the course concentrates on the sciences which are concerned with soil productivity and plant and animal production. They include soil chemistry and physics, plant and animal nutrition, physiology and biochemistry, and plant and animal health. For these, the basic science courses (first and part of second year) are chemistry, mathematics, physics and biology. Production economics, farm-management economics, rural sociology and agricultural extension constitute one third (or more, depending on the student's interest) of the third and fourth years of the course following an introduction to the subject in the second year.

The course leads to a B Agr Sc (pass or honours degree) at the end of four years. Graduates may then do postgraduate course work and research in a specific area of agricultural biology or in agricultural economics, leading to a Ph D or M Agr Sc degree or they may undertake the one-year program of study for the Graduate Diploma of Agriculture.

Some 6 hectares of the University campus are presently used by the School of Agriculture for field work involving crops, pastures and livestock. This gives students day to day contact with agricultural experimentation as well as with the more applied aspects of crop and animal husbandry.

Agricultural science graduates find employment in a wide variety of positions in State and Commonwealth government departments, as research workers or extension officers, in advisory and teaching services or in special areas such as conservation, agricultural economics and trade. Many have joined private firms which service the agricultural industries or process agricultural products, for example, chemical and food processing companies and agricultural consultant and management groups. It can be expected that, as the Australian economy develops and agriculture adapts to the rapid changes now occurring, the opportunities open to graduates may also change. For example, there will be increasing emphasis on environment protection, conservation and land use in the coming years and agricultural scientists are

well suited to undertake many tasks in these areas. Indeed many agricultural scientists have been engaged in this kind of activity for a long time. Also private organizations such as large scale primary producers, commodity boards and other marketing groups and farmer organizations may become larger employers of agricultural science graduates; there are already at least 130 non-government employers of such graduates in Australia.

It will be noted that text and reference books are not listed in this handbook. The School publishes a separate handbook which is issued to students on enrolment. It contains further information on text books and also more details of course content and requirements. This handbook is available to secondary schools on request.

Prerequisite for Admission

To have passed the higher school certificate examination in chemistry and in either physics or a branch of mathematics. This is the minimum requirement; most students are expected to have done physics and at least one branch of mathematics. However, prerequisites have been waived in the past for particular students with an appropriate background and interest in the subject. Prospective students who might fall into this category should not hesitate to contact the Dean of the School of Agriculture in the first instance. It is usually a simple matter to arrange an interview, either by letter or by telephone, particularly if this is done before mid-December. Diplomas from approved agricultural colleges are accepted as satisfying the prerequisites, providing a pass in higher school certificate English expression has been obtained, but possession of a diploma does not give automatic entry to the School.

Quota and Selection

Unless the number of students seeking entry into the School of Agriculture is far greater in 1975 than it was in 1974 no quota will be imposed in 1975. However, should this number be greater than expected, selection will, in the first instance, be on academic merit judged by reference to examination results. Prospective students, other than those seeking entry direct from higher school certificate examination, may be required to attend for interview by the selection committee between 21 January and 16 February. Interviews outside this period can, however, be arranged by writing direct to the School of Agriculture, preferably as early as possible.

Academic Progress

Passes in each subject will normally be graded in four categories: A, B, C and D. A: 80 to 100 per cent. B: 70 to 79 per cent. C: 60 to 69 per cent. D: 50 to 59 per cent. Less than 50 per cent constitutes a failure.

The academic progress committee of the School maintains a continuing review of students' academic progress and students may at any time of the year be asked to meet this committee to discuss their performance. A student whose progress has been considered unsatisfactory may be informed that, should he again seek enrolment, he will be required to show cause why such enrolment should be allowed. Alternatively he may be permitted to enrol but warned that subsequent failure to make satisfactory progress will mean automatic exclusion from the course. In any event a student will not be allowed to retain his place in the School if his progress continues to be unsatisfactory, and enrolment may be terminated at any time.

A student will normally be required to pass all subjects of one year before proceeding to the next year or to achieve such a standard as to be awarded a pass in the year as a whole, under conditions laid down from time to time by the board of studies.

DETAILS OF SUBJECTS

First-Year Course

Agriculture I, Biology IA (botany and genetics), Chemistry I, and Physical Sciences IT (mathematics and physics). The curricula for subjects other than Agriculture I are set out under their appropriate subject headings in the disciplines section of this handbook.

Agriculture I: a course of 70 lectures, plus about 20 practical classes. Agricultural botany; the classification and identification of plants (weeds, grasses and legumes) important to agriculture. Introductory animal science, with particular reference to animal diversity, the microstructure (histology) of animal tissues and the anatomical systems of the domestic animals. Principles of climatology, with particular reference to physical aspects; climate and vegetation, climate and pasture; chemical composition of pastures and seasonal changes, introductory animal nutrition.

Second-Year Course

The second year includes Agriculture IIA (animal physiology), Agriculture IIB (soil science), Biology II (plant anatomy and physiology, agricultural genetics — see under biology), Chemistry IIB (see under chemistry), and Agriculture IIC (economics). These subjects do not carry equal weightings; Chemistry IIB is greater and Agriculture IIC is less in content than the other three subjects.

Agriculture IIA is a course of about 50 lectures and 20 three-hour practical classes. The course is intended to provide an understanding of the principles of animal physiology, with emphasis on the interdependence between the different systems of the animal body, the exchanges that occur in the body,

and the regulatory mechanisms that serve to maintain the constancy of the internal environment. Topics considered in detail include growth, reproduction, endocrinology and the physiology of digestion.

Agriculture IIB is a course of about 50 lectures and 15 three-hour practical classes, including field excursions. The course is intended to promote an understanding of the soil as *an environment* from which plants derive nutrients. The course includes: a description of the solid phases of soils and their formation; soil erosion; soil microbiology; and the chemistry of essential plant nutrients in relation to their availability to plants.

Agriculture IIC is a course of about 20 lectures and up to 10 tutorials. The course is intended to introduce the basic concepts and principles of economics and to demonstrate the relevance of these principles to decision-making in agriculture for the individual farm, for particular agricultural industries, and at the national and international levels.

Third-Year Course

Agriculture IIIA (animal sciences), Agriculture IIIB (soil-plant sciences) and Agriculture IIIC (economics, agricultural economics, computing and statistical methods) each account for one-third of the third year of the course.

Agriculture IIIA includes nutritional biochemistry and physiology, and agricultural microbiology: *Biochemistry*: 40 lectures and 10 six-hour practical classes. Enzyme action; pathways of metabolism of carbohydrates, lipids, amino acids, proteins and nucleic acids; photosynthesis; regulation of metabolic processes; introduction to chemotherapy and the action of toxic compounds. *Physiology and Nutrition*: 40 lectures, practical classes and demonstrations. Food intake; chemistry, physiology and bacteriology of digestion and absorption in ruminants and non-ruminants; quantitative aspects of metabolism of carbohydrates, fats and proteins, hormonal control of metabolism; metabolism in undernourishment, pregnancy and lactation; energy requirements for maintenance, growth, fattening, pregnancy and lactation; protein, mineral and vitamin requirements. *Microbiology*: 20 lectures and 25 practical classes. Bacteriology: bacterial form, structure, growth and spore formation; the micro-organism and its environment; classification and nomenclature; viruses; sterilization and disinfection; microbiology of special environments, e.g. milk and milk products.

Agriculture IIIB deals with plants and their chemical, nutritional and physical environments. It is currently presented in three segments. *Soil physics*: 30 lectures, practical classes and field work, dealing with the use of physical methods and techniques for the description and measurement of the soil physical environment, the relation between the physical environment and

plant growth. *Plant and crop physiology*: 30 lectures and practical classes and field work dealing with photosynthesis and transpiration of leaves, plants and crops as related to environmental factors; physiological basis of yield; optimum productivity; growth analysis; competition; structure, light relationships and photosynthesis of plant canopies; introduction to the simulation of plant growth. *Plant nutrition*: 30 lectures and practical classes dealing with crop germination and establishment; root development; the cell and cell membranes; nutrient uptake and transport; nutrient functions, deficiencies and toxicities; fertilizer use in relation to plant growth, animal health and pollution.

Agriculture IIIC has three components. *Microeconomics*: about 30 lectures and 10 tutorials in the first half of the year. Topics include the price mechanism; opportunity cost, demand and supply; the concept of elasticity; profit maximization and marginal concepts; pure competition, imperfect competition, monopoly and oligopoly; countervailing power; pricing behaviour; microeconomic policy. *Production economics*: about 30 lectures and 10 tutorials in the second half of the year. Planning under perfect knowledge: concept of production functions; law of diminishing returns; marginality, marginal, average and total product, elasticity of production; factor-product relationships; factor-factor relationships; resource substitution; price ratios; resource combination; cost minimization; iso-cost curves; iso-product curves; resource allocation; joint products; by-products; competitive products. Planning under imperfect knowledge: concept of risk and uncertainty; basic probability theory; discounting; time and risk; planning under risk situations; planning under uncertain situations; minimizing income variations; resource allocation at the national policy level. *Statistical methods*: one lecture and one practical a week throughout the year. Populations; distributions and their properties; significance tests; linear regression; correlation; analysis of variance; experimental design. Introductory computer programming: Fortran IV.

Fourth-Year Course

As in third year, there are three subjects: Agriculture IVA (animal sciences), Agriculture IVB (soil-plant sciences) and Agriculture IVC (agricultural economics, farm management, rural sociology and agricultural extension).

Formal contact hours — lectures or practical classes — are kept to the minimum necessary to complete the basic requirements of the course (see below) and comprise only about 30 per cent of the work load. Students must satisfy the requirements of the basic minimum courses but, by the choice of a number of advanced topics and written assignments and a 12-week research project to be carried out and written up in thesis form in third term, they are able to develop their own particular interests to a considerable extent.

Special courses in radio-active isotope usage, in basic electronics in plant and animal environment measurement and in computer simulation of physical and biological processes, have been offered as options. Applications to take units of subjects offered in other Schools will also be considered. Students in this year are also required to participate in a comprehensive seminar program arranged by the School by giving at least one seminar themselves and attending others given by postgraduate students, by members of staff or by distinguished visiting lecturers.

The basic (minimum) courses are as follows:

Agriculture IVA: A two-term course of lectures plus practicals. Part of the course is devoted to *parasitology* – life histories of parasitic arthropods and helminths; epidemiology and current methods of parasitic disease control; *infectious diseases* – the nature of and the factors which determine the onset of infectious disease; mode of transmission with examples of endemic and exotic diseases; quarantine; *immunology* – natural resistance and acquired immunity; antigenic determinants and antibodies, vaccination and hypersensitivity, serology. The rest of the course consists of lectures and selected topics of special importance in animal production, given partly by the staff of the School and partly by visiting lecturers who are recognized authorities in their fields. Such special courses have covered human and animal nutrition, animal reproduction, growth and development, animal breeding, antibiotics, plants poisonous to animals etc.

Agriculture IVB: A two-term course of lectures plus practicals. Part of the course is devoted to *entomology* – a brief synopsis of insect classification; feeding habits and types of damage; insect and mite pests of agricultural importance with special reference to Australia; chemical, biological, cultural and other control methods; integrated control and pest management; *plant pathology* – an introductory course to applied mycology, virology and nematology. The rest of the course consists of lectures on selected topics of special importance in the plant-soil sciences, given partly by the staff of the School and partly by visiting lecturers who are recognised authorities in their fields. Such special courses have covered soil pollution, fertiliser use, drainage and salinity, soil conservation and land use, crop physiology, pastures etc.

Agriculture IVC: The course has two components. *Sociology and extension:* 12 lectures. Communication; perception; empathy; meaning; organizations; filtration and overload; spreading new ideas in rural areas; the importance of opinion leaders; motivation; getting ideas into practice; a theory of social action. *Agricultural economics and business management* – three lectures a week in first and second terms plus assignments and topics. The estimation of response surfaces; functional forms for production functions; the role and functions of management; farm business analysis, budgets, gross margins and

programming methods for farm planning; farm planning under risk; long-run farm planning; systems analysis in agricultural management; agricultural marketing; agricultural prices; organization in agriculture; government intervention and agricultural policy; farm finance; evaluation of public investment in agriculture; technical change.

Plant Collection

Students are required to make a plant collection as part of the plant-sciences area of study and progress is assessed each year. The first section of the collection, consisting of 50 species, must be handed in at the end of first year as part of the field botany component. The final assessment will be made on a collection of at least 150 correctly identified specimens which must be submitted by the end of the first week of first term in the fourth year of the course.

Farm Practical Work Requirements

All students are required to obtain at least 12 weeks' practical farm experience. Usually a maximum of four weeks' credit is given for a work period on a single farm. Credit up to four weeks may also be given for practical work in other approved (off-farm) agricultural activities, for example government departments, secondary industry associated with agriculture etc.

Students with a farming background and those with a diploma from a recognised agricultural college may be granted exemption for part or all of this requirement.

A written report of acceptable standard must be submitted within the academic term following each vacation exercise. Late reports may result in credit not being granted for the work involved; poor reports may be rejected and returned for re-writing.

Students seeking exemption are also expected to submit a report of acceptable standard stating their reasons and describing their background and the experience already gained.

Students are responsible for arranging their own vacation work but overseas students may be given some assistance.

Excursions

Some excursions are an essential part of certain subjects, and are therefore compulsory; others are optional. Compulsory excursions are normally paid for by the School; the costs of optional excursions must be met by the student.

Half-day and full-day excursions form part of the second, third and fourth years. The major excursion will be after the end of second term in fourth year and may cost students about \$30.

POSTGRADUATE STUDIES

The School of Agriculture offers programs leading to a Graduate Diploma of Agriculture (GDA) and to the higher degrees, Master of Agricultural Science (M Agr Sc) and Doctor of Philosophy (Ph D). The Graduate Diploma is a one-year program of mostly formal courses selected to meet the students' interest. The Masters degree program has a minimum duration of two years and may involve both coursework and research. The coursework component can comprise any proportion of the final assessment. Candidates for, or students holding, the Graduate Diploma can apply for conversion to the Masters program. The Ph D is a research degree awarded by examination of a thesis reporting original research work carried out under supervision over a minimum candidacy of three years. Coursework undertaken during this time is not assessed but is encouraged where it aids the candidate's research progress.

University regulations require an appropriate degree for admission to the Masters program and at least a 2A honours degree or a Masters degree for admission to Ph D candidature.

Postgraduate Courses

A flexible structure of postgraduate courses has been designed to meet a variety of interests and to allow for continued development. Individual subjects, of which some 40 are offered, comprise about 10 lectures plus associated activities and are grouped into the following four broad subject areas: (1) numerical studies (core area); (2) soil-plant sciences (theme: crop and pasture development); (3) animal sciences (theme: intensive animal production); (4) agricultural economics.

Graduate Diploma

A candidate for the Graduate Diploma is required to complete at least 12 units. Of these three to six units must be selected from numerical studies (core area) with the remainder selected from the elective areas. In addition candidates will work individually for about one term (one third of the year) on a short project or case study. This work will be assessed by written thesis.

Further details on postgraduate studies are available from the office of the Dean, School of Agriculture.

PART IV SCHOOL OF BEHAVIOURAL SCIENCES

The School of Behavioural Sciences was founded in 1973 and consists of the departments of genetics, psychology, sociology and zoology. Plans are under consideration for the addition of new departments at the senior undergraduate and postgraduate levels. These additions will include:

Clinical Psychology

A clinic has been established in the psychology department to provide teaching and research facilities in clinical psychology, which are normally available for honours and graduate students in the School of Behavioural Sciences.

In 1976 it is hoped the postgraduate course in clinical psychology will be available to graduates of this and other universities to enable them to obtain registration as professional psychologists.

Social Work

A limited number of graduates, who have completed an undergraduate course including psychology and sociology, will be admitted to a social work course in 1976.

Occupational Psychology and Sociology

A course is proposed in occupational psychology and sociology, and plans are being made for it to commence in 1976, but no details are available at present.

DEGREE STRUCTURES INCLUDING PSYCHOLOGY

STUDENTS ENROLLED IN THE SCHOOL OF BEHAVIOURAL SCIENCES

(a) The School of Behavioural Sciences offers a course leading to a Bachelor of Behavioural Science degree (B B Sc) with a major in psychology. There are no prerequisites for entry to the School, but students intending to enrol in subjects provided by the Schools of Biological Sciences and Physical Sciences are required to meet the prerequisites laid down by those Schools.

The pass course requires three years of full-time study. An extra year of study is required for the honours degree, and may lead to registration as a professional psychologist after further postgraduate training or supervised experience.

(b) The pass degree comprises nine units and includes:

- (1) a sequence of three psychology units, at least one biology unit and at least one sociological unit;
- (2) not more than four units are taken at first-year level and at least two units are required at third-year level;

(3) a student is not normally allowed to take more than three units from outside the disciplines of genetics, psychology, sociology and zoology, but other units may be permitted in special cases with the approval of the board of studies.

(c) At the end of first year, students may enrol for a Diploma in Education course taken concurrently with the degree course.

(d) The following subjects are available within the School of Behavioural Sciences:

First year. Psychology I, Behavioural Biology IT, Biology IB, Sociology I.

Second year. Psychology II, Genetics II, Sociology II, Zoology II.

Third year. Psychology III, Genetics III, Sociology III, Zoology III.

STUDENTS ENROLLED IN OTHER SCHOOLS

Students enrolled in Schools other than Behavioural Sciences should, of course, comply with the degree structure of their respective Schools. Such students should, however, note the next paragraph.

Concurrent Study of Biology

We feel that the fullest understanding of behaviour and of psychology requires some background in biology, therefore students enrolled for the B B Sc degree are required to pass in a biology unit. However, students enrolled in other Schools and who are taking Psychology I are strongly advised to include a biology unit in their first-year studies also. Those students who wish to go on to higher-year studies in biology (and who have the necessary prerequisites) should take Biology IB, but those students who are seeking a grounding in biology as background to studies in psychology should take Behavioural Biology IT, which is a one-year course especially designed to give the appropriate background for students in behavioural sciences. Some B B Sc students may choose to do both courses.

Neither biology unit is a prerequisite for entry to Psychology II, and students in Schools other than Behavioural Sciences may go on to higher studies in psychology without them, however it is our advice that an introduction to modern biology will complement and assist study in psychology. Further it will be assumed that students who elect to take Psychology II have completed the Behavioural Biology IT unit. Thus, taking this biology subject as part of the first year course both complements the studies in psychology and keeps the options open for second and third-year studies.

CONCURRENT COURSES IN EDUCATION

Since 1973 at La Trobe University a concurrent course has been offered leading to the award of a bachelor degree and a Diploma in Education and the

SCHOOL OF BEHAVIOURAL SCIENCES

following are some of the patterns possible in the School. Other patterns may be developed in consultation with advisers of studies of the School of Behavioural Sciences.

Pattern of courses possible with a B B Sc

Year	Major Subject	Minor Subject	Third Subject	Education
1	Psychology I	Sociology I	Behavioural •Biology IT	—
2	Psychology II	Sociology II	—	Education II
3	Psychology III	Sociology II (2 x ½ units)	—	Education III
4	—	Sociology III	Sociology III (2 x ½ units)	Education IV

Year	Major Subject	Minor Subject	Third Subject	Fourth Subject	Education
1	Psychology I	Biology IB	Sociology I	Maths I	—
2	Psychology II	Zoology II	—	—	Education II
3	Psychology III		—	Maths II	Education III
4	—	Zoology III	—		Education IV

B B Sc (HONOURS) AND HIGHER DEGREES

Students wishing to obtain the degree of B B Sc (honours), M Sc or Ph D may be accepted by the department of psychology provided their previous academic record is of high standard. Approval of the board of studies is required. Prospective candidates should contact the chairman of the department for further information.

Details of the psychology courses offered in 1975 are shown in the disciplines section of this handbook.

PART V SCHOOLS OF BIOLOGICAL AND PHYSICAL SCIENCES

DEGREE OF BACHELOR OF SCIENCE IN THE SCHOOLS OF BIOLOGICAL AND PHYSICAL SCIENCES

A person may undertake the B Sc degree course in either the School of Biological Sciences or the School of Physical Sciences. In making application for entry into the B Sc degree students should give some consideration to the subjects proposed for study in later years of the course. Students contemplating physical science subjects as major studies should apply for entry into the School of Physical Sciences; students contemplating biological sciences subjects should apply for entry into the School of Biological Sciences. In the event of a student's interests changing during the first year the student may change Schools subject to the approval of the appropriate board of studies.

The pass degree will consist of subjects which have a total work value of nine units, including one each year from the main discipline and should be taken over a period of not less than three years as shown in Table I below.

Table 1

School	Degree	Years of study for pass degree	Total units to qualify	Units at each year level			
				1st	2nd	3rd	4th
Biological Sciences	B Sc	3	9	4	3	2	—
Physical Sciences	B Sc	3	9	4	3	2	—

An honours degree will be awarded on the basis of a fourth year of study upon completion of the pass-degree course. A pass in a science language may be a requirement for an honours degree, but not for the pass degree.

Completion of a subject includes attendance at such lectures and tutorial classes as prescribed as well as completion of such exercises and laboratory work as shall satisfy the discipline concerned. If a student has not complied with the prescribed requirements, he may be refused admission to the annual examination in that subject. Reasonable notice of the prescribed requirements will be given.

At the beginning of each year, a student shall obtain the approval of an adviser of studies of the School for his proposed selection of subjects to be completed in that year.

No student may: (a) take subjects which have a total work value of more than four units in the first year; (b) take a second-year level subject until he has completed first-year subjects with a total work value of three units, except with the permission of the School.

Except with the approval of the School, a candidate shall complete all subjects within a period of six years from the beginning of the academic year in which he completes the first of such subjects.

Part-time enrolment in the sciences involving laboratory work will normally not be permitted.

COURSE STRUCTURES FOR THE B SC DEGREE

A summary of these structures is set out in Table II.

Table II: Course structures for the B Sc degree in the Schools of Biological and Physical Sciences

Note: This table is a summary only. Certain restrictions apply in the choice of subjects, especially in the choice of mathematics subjects. These restrictions are set out under choice of subjects.

Year	School of Biological Sciences	School of Physical Sciences
1st year	Four subjects, two of which must be Biology IA and Biology IB. Chemistry I is highly recommended as a third subject.	Four subjects, at least two of which must be selected from Chemistry I, Geology I, Mathematics IA, Mathematics IB and Physics I.
2nd year	Three subjects, at least two of which must be selected from Biochemistry II, Botany II, Genetics II, Microbiology II and Zoology II.	Three subjects, at least two of which must be selected from Chemistry II, Geology II, Physics II and various Mathematics II subjects.
3rd year	Two subjects, at least one of which must be selected from Biochemistry III, Botany III, Genetics III, Microbiology III and Zoology III.	Two subjects, at least one of which must be selected from Chemistry III, Geology III and Physics III, and various Mathematics III subjects.

SCHOOL OF BIOLOGICAL SCIENCES

Five disciplines are offered in the School of Biological Sciences: biochemistry, botany, genetics, microbiology and zoology.

The prerequisites for the School of Biological Sciences are passes in the higher school certificate examination in chemistry and one of physics, biology or a branch of mathematics.

Table II fully describes the course structure for the B Sc degree within the School of Biological Sciences. Students can elect to take subjects from other Schools provided that the essential criteria set out in Table II are fulfilled and that the choice is verified by a student adviser from the School of Biological Sciences.

SCHOOL OF PHYSICAL SCIENCES

The prerequisites for the School of Physical Sciences are passes in the higher school certificate examination in one of the following combinations of subjects: (a) any two of chemistry, physics, pure mathematics, applied mathematics; (b) general mathematics and either chemistry or physics.

Four disciplines are offered in the School of Physical Sciences: chemistry, geology, mathematics and physics.


In the first year a student is required to take four subjects. One of these may be a first-year course offered by the School of Biological Sciences and one may be a subject from the School of Humanities or the School of Social Sciences or the department of psychology. Students enrolled in the School who wish to take a unit in mathematics are required to take Mathematics IA, or Mathematics IA and Mathematics IB. Mathematics IC is available only to students enrolled in other Schools.

At the second-year level where three subjects are required, a student may offer one subject from the School of Biological Sciences or one in philosophy or one in psychology. One unit of biology or philosophy or psychology may also be offered at third-year level. These requirements have been summarized in Table II.

The School of Physical Sciences, in conjunction with the department of economics, also offers a course leading to a B Sc degree in which economics can be taken with science subjects. The course consists of nine-and-one-half units, four in the first year, three-and-one-half in the second and two in the third year. Students interested in this course should discuss details with an adviser of studies of the School of Physical Sciences.

SUBJECT SEQUENCES

Note: Subjects joined  c both a and b are required to continue with c

Subjects joined  c a or b is required for c

First Year Four Units (at least three Science units)

Biology IA

OR

Biology IB

Mathematics IA/IC

Chemistry I

Physics IA

Physics IB

Mathematics IA

Mathematics IB

Geology I

Philosophy I

Any University unit I

Second Year Three Units

Botany II

Genetics II

** Zoology II

Biochemistry II

Microbiology II

Chemistry IIA

Chemistry IIB

Physics IIA

Physics IIB

Maths Stats II

Pure Maths II

Applied Maths II

Geology II

Physical Sciences II

* Philosophy II

Third Year Two Units

Botany III

Genetics III

Zoology III

Biochemistry III

Microbiology III

Chemistry IIIA

Chemistry IIIB

Physics IIIA

Physics IIIB

Maths Stats III

Pure Maths III

Applied Maths III

Geology III

Physical Sciences III

Philosophy III

Fourth Year Honours

Botany IV

Genetics IV

Zoology IV

Biochemistry IV

Microbiology IV

Chemistry IV

Chemistry IV

Physics IV

Maths Stats IV

Pure Maths IV

Applied Maths IV

Geology IV

* Sufficient prerequisites for some Philosophy II subjects are any two science units.

** Mathematics IA/IC and Chemistry I are recommended prerequisites in addition to Biology IB (compulsory).

FIRST-YEAR SUBJECTS

Four subjects to be taken from the following, each of which has a work value of one unit:

Biology IA, Biology IB, Chemistry I, Geology I, Mathematics IA and IB, Mathematics IC (cannot be taken in combination with Mathematics IA or Mathematics IB), Physics I, subjects with a total work value of one unit from the School of Humanities or the School of Social Sciences or the department of psychology. (Social Sciences IA-IB and Social Sciences IA-IC are not acceptable for this purpose). Disciplines available in the Schools of Humanities and Social Sciences are art history, economics, English, French, history, Italian legal studies, music, philosophy, politics, sociology and Spanish.

To complete his first year a student shall: (a) pass in subjects which have a total work value of four units *or* (b) be passed by the School in the year as a whole.

Normally, all students in the School of Biological Sciences must take Biology IA and IB. Students in the School of Physical Sciences can take either Biology IA or Biology IB but not both.

Students taking the combined science/economics course can choose three units from the physical sciences subjects with Economics I.

SECOND-YEAR SUBJECTS

Subjects which have a total work value of three units to be taken from Applied Mathematics II, Biochemistry II, Botany II, Chemistry IIA, Chemistry IIB, Genetics II, Geology II, Mathematical Statistics II, Microbiology II, Philosophy IIFA, Philosophy IIFB, Philosophy IILA, Philosophy IIPM, Philosophy IIPS, Philosophy IISA, Psychology II, Physics II, Pure Mathematics II, Physical Sciences II or Zoology II.

Only two of the philosophy subjects may be taken (all are half units). Chemistry IIA and IIB cannot be taken in combination. Students from the School of Biological Sciences must take at least two from Biochemistry II, Botany II, Genetics II, Microbiology II and Zoology II.

Students taking the combined science-economics course can choose two units from the physical sciences subjects with one-and-one-half economics units.

Details of individual subjects are given in the section on the discipline concerned. A table showing the prerequisites and work value for each unit appears elsewhere in this handbook.

THIRD-YEAR SUBJECTS

Subjects which have a total work value of two units to be taken from: Applied Mathematics III, Biochemistry III, Botany III, Chemical Physics III, Chemistry IIIA, Chemistry IIIB, Computer Science III, Genetics III, Mathematical Statistics III, Microbiology III, Philosophy IIIFA, Philosophy

IIIFB, Philosophy IIIFC, Philosophy IIIFD, Philosophy IIIFE, Philosophy IIIFF, Philosophy IIILA, Philosophy IIIPM, Philosophy IIISB, Philosophy IIISA, Psychology III, Physics IIIA, Physics IIIB, Pure Mathematics III, Physical Sciences III or Zoology III.

Any three of the listed philosophy subjects may be taken (providing they have not already been taken at second year) to form a third-year science unit.

Students taking the combined science-economics course can choose one unit from physical sciences with one economics unit.

Details of individual subjects are given in the section on the discipline concerned. A table showing the prerequisites and work value for each unit appears elsewhere in this handbook.

HONOURS DEGREE

Entry to the fourth year will be limited to those who have reached a satisfactory standard in the course for the pass degree. Graduates from other universities may also be admitted in special circumstances. To qualify for the honours degree, students should enrol on a full-time basis. Successful students will be awarded first-class, second-class (upper division), second-class (lower division), or third-class honours.

It is intended to allow specialization in a range of studies reflecting the academic interests of the Schools. The School of Physical Sciences will offer fourth-year courses in chemistry, geology, mathematics, and physics and one of an interdisciplinary nature. The School of Biological Sciences offers honours courses in biochemistry, botany, genetics, microbiology and zoology. Entry to an honours-degree course in the School of Biological Sciences will be at the discretion of the chairman of the department concerned and will be decided on the results obtained in the pass-degree course taken in the School or elsewhere.

ACADEMIC PROGRESS

The results of a student who completes a pass or honours subject will be graded in four categories: A, B, C and D. A: 80 to 100 per cent. B: 70 to 79 per cent. C: 60 to 69 per cent. D: 50 to 59 per cent. Less than 50 per cent constitutes a failure.

Each year the academic progress committees of the Schools review the academic progress of students. A student whose progress has been considered unsatisfactory may be informed that should he again seek enrolment in a course or in a subject he will be required to show cause why such enrolment should be allowed. Alternatively he may be permitted to re-enrol but warned that subsequent failure to make satisfactory progress will mean automatic exclusion from that course or from that subject.

A student will not be allowed to continue his enrolment in any subject in which he is not making satisfactory progress. The final assessment of a

BACHELOR OF SCIENCE

student's progress may take into account his performance in tutorials, practical work, assignments and any other prescribed work.

A student who fails to meet the requirements established by each School may be considered not to have made satisfactory academic progress. In attempting to meet these requirements, a student will not normally be permitted to enrol for any subject more than twice.

A full-time student will normally be expected to obtain a work value of at least two units at the end of the annual examinations in his first year, at least four units within two calendar years, and at least seven units within four calendar years. A full-time student will be expected to complete the requirements for his degree within six calendar years of his first effective enrolment. A student having more than one unit outstanding shall not normally proceed to the next year's course.

The minimum rate of progress for a part-time student will be determined by the board of studies in each individual case.

DEGREE OF BACHELOR OF BEHAVIOURAL SCIENCE IN THE SCHOOL OF BEHAVIOURAL SCIENCES

Students may take a Bachelor of Behavioural Science degree course in the School of Behavioural Sciences. Details are shown in the entry for that School, see Part IV of this handbook.

PART VI GRADUATE STUDIES

Graduates may apply at any time to be admitted as candidates for the degrees of Master of Science, or Doctor of Philosophy. An appropriate honours degree will normally be the preliminary requirement for admission to any postgraduate-degree course. In some disciplines it may be possible to complete the work for the master's degree by thesis, by course work or a combination of the two. In most disciplines it is possible to read for a master's degree on a part-time basis. Persons seeking enrolment for a higher-degree course should first contact the professor of the appropriate discipline to discuss their particular research interests, as consideration of an application for a higher-degree course will depend on the availability of facilities and suitable supervisors. The candidature of each prospective student must be approved by the appropriate higher-degree committee before the student can be admitted to the University.

Further information on the fields of research pursued appears under the appropriate discipline.

PART VII DISCIPLINES

The following pages contain details of the disciplines in which subjects are offered. The disciplines are listed in alphabetical order. Information on examination requirements, lectures and other work requirements and postgraduate studies are included. Details of incompatible, companion and prerequisite subjects are set out in the table of subjects. Details of disciplines offered in the Schools of Education, Humanities and Social Sciences are included in a separate volume of the handbook.

AGRICULTURE

For details of agriculture subjects see the School of Agriculture entry in this volume of the handbook.

BEHAVIOURAL BIOLOGY

BEHAVIOURAL BIOLOGY IT One Unit

Syllabus: The course aims to give a biological background for behaviour studies in Psychology II: introduction to molecular aspects of biology; an introduction to the structure and function of cells; the basic principles of genetics; the genetics of behaviour; evolution and natural selection; the evolution of mammals; mammalian physiology; animal ethology.

Prerequisites: None. Confined to students also taking Psychology I.

Class Requirements: Three 1-hour lectures a week for three terms. One tutorial a week for the genetics component (first term), demonstration and practical sessions in association with the other components.

Prescribed Reading

Genetics Notes by the department of genetics.

Adams, P. *et al. Biology Today*, CRM Book, California 1972

Rowett, H.G.Q. *Dissection Guide III. The Rat*, John Murray, London

Recommended Reading

Parsons, P.A. *The Genetic Analysis of Behaviour*, Methuen, London 1967

Taylor, G.R. *The Science of Life*, Panther paperback, London 1967

Others may be recommended during the course.

BIOCHEMISTRY

The department of biochemistry offers courses which form part of the second and third year of the B Sc (pass) degree and may lead to a B Sc

(honours) degree in biochemistry. Postgraduate training to the M Sc and Ph D levels is also available.

The courses available provide instruction in both theoretical and practical aspects of the subject and may be taken with other subjects offered by the School of Biological Sciences, the School of Physical Sciences and the School of Behavioural Sciences. It is thus possible to vary the course structure to obtain background experience suitable for different professional careers.

A sound biochemical training must be founded on a strong basis of chemistry as well as a good background in biological principles and techniques. The courses set out below incorporate these features.

FIRST YEAR

Biological Sciences students: Biology IA, Biology IB, Chemistry I, and one other subject.

Physical Sciences students: Biology IA or IB, Chemistry I, and two other subjects.

Behavioural Sciences students: Biology IB, Chemistry I, Psychology I, and one other subject.

SECOND YEAR

Biochemistry II and two of: Botany II, Genetics II, Microbiology II, Zoology II, Chemistry IIA or IIB, any other second-year physical sciences subject, Psychology II, Philosophy II.

THIRD YEAR

Biochemistry III and one of: Botany III, Chemistry IIIB, Genetics III, Zoology III, Psychology III.

Details of the courses offered by the biochemistry department are described below. Further information may be obtained from the chairman of the department or from the adviser of studies.

BIOCHEMISTRY II

Prerequisites: 1. Chemistry I; 2. Biology IA or IB.

Syllabus: Protein structure and function; basic enzymology; polynucleotide structure/function/biosynthesis; protein synthesis; lipids and membranes; polysaccharide structure and function. Carbohydrate and lipid metabolism; energetics and biological oxidations; nitrogen metabolism; metabolic control; digestion and absorption.

Class Requirements: The course consists of three lectures a week, and one afternoon of practical work a week throughout the year in experiments concerning techniques in quantitative biochemistry.

BIOCHEMISTRY

Prescribed Text: One of

Lehinger, A.L. *Biochemistry*, Worth 1972

Conn, E.E. and Stumpf, P.K. *Outlines of Biochemistry*, Wiley International 1972

Yudkin, M.D. and Offord, R.E. *Comprehensible Biochemistry*, Longman 1973

Bohinski, R.C. *Modern Concepts in Biochemistry*, International Student edn 1973

Recommended for Reference

McGilvery, R.W. *Biochemistry – A Functional Approach*, Saunders 1970

Mahler, H.R. and Cordes, E.H. *Biological Chemistry*, 2nd edn, Harper 1971

White, A., Handler, P. and Smith, E.L. *Principles of Biochemistry*, 4th edn, McGraw Hill 1968

Rees, D.A. *The Shapes of Molecules*, Oliver and-Boyd 1967

Barker, R. *Organic Chemistry of Biological Compounds*, Foundations of Modern Biochemistry Series, Prentice Hall 1971

Assessment: Candidates will be assessed by their performance in assignments and written tests held during the year and in written papers given at the end of the course.

Performance in practical work will be assessed weekly.

Students must obtain a satisfactory standard in both the theoretical and practical aspects in order to pass the course.

BIOCHEMISTRY III

Prerequisite: Biochemistry II.

Syllabus: The chemistry, physico-chemistry and biochemistry of macromolecules of biological importance. The kinetics and mechanism of enzyme action. The biochemistry of cell membranes in relation to energy transformations and cellular transport phenomena. The integrated operation and functions of metabolic pathways for the metabolism of carbohydrates, lipids, amino acids, purines and pyrimidines. The regulation of metabolism at the cellular, tissue and whole organism levels. Cellular and tissue specificity in metabolism. Metabolism in selected nutritional and abnormal states. Developmental biochemistry – regulation of RNA and protein synthesis – differentiation, ontogeny of enzymes, organogenesis. Biochemical evolution. Selected topics in the biochemistry of foods, drug metabolism and clinical biochemistry.

Class Requirements: The course consists of four lectures a week throughout the year and an average of 10 hours a week practical work or practice classes concerned with experimental methods and calculations in physical biochemistry, enzymology, metabolism, and the separation and analysis of biological molecules and organelles.

Books: No text is prescribed but the following books between them cover most aspects of the course. Other literature relevant to special sections of the course will be advised by the lecturers concerned.

- McGilvery, R.W. *Biochemistry – A Functional Approach*, Saunders 1970
 Mahler, H.R. and Cordes, E.H. *Biological Chemistry*, 2nd edn, Harper 1971
 Dawson, R.M.C., Elliot, J. and Elliot, W.M. *Data for Biochemical Research*, 2nd edn. Oxford Univ. Pr. 1969
 Dixon, M. and Webb, E.C. *Enzymes*, 2nd edn, Longmans 1964
 Bernhard, S. *The Structure and Function of Enzymes*, Benjamin 1968
 Van Holde, K.E. *Physical Biochemistry*, Prentice Hall 1971
 Tanford, C. *Physical Chemistry of Macromolecules*, John Wiley 1961
 Larner, J. *Intermediary Metabolism and its Regulation*, Prentice Hall 1971
 Cohen, G.N. *The Regulation of Cell Metabolism*, Holt, Rinehart and Winston 1968
 Frieden, E. and Lipner, H. *Biochemical Endocrinology of the Vertebrates*, Prentice Hall 1971
 Watson, J.D. *Molecular Biology of the Gene*, 2nd edn, Benjamin 1970
 Davidson, E. *Gene Activity in Early Development*, Academic Press 1968
 Markert, C.L. and Ursprung, H. *Developmental Genetics*, Prentice Hall 1971
 Bull, A.T. *et al. Companion to Biochemistry*, Longman 1974

Assessment: Candidates will be assessed by their performance in assignments and written tests held during the year and in written papers given at the end of the course.

Performance in practical work will be assessed continuously throughout the year. Students must obtain a satisfactory standard in both theoretical and practical aspects in order to pass the course.

HONOURS

A one-year honours course in biochemistry is available to graduands from La Trobe, or from other universities with equivalent B Sc courses. The course consists of a research project, lectures, student seminars and such other work as may be required.

As the research project is the major component of the course, students desiring to enrol are expected to have demonstrated a high standard in practical work, as well as having achieved a satisfactory overall performance in both Biochemistry III and their other third-year subject. Students intending to enrol in the honours course should consult the chairman of the department.

POSTGRADUATE STUDY

Prospective M Sc and Ph D students should contact the chairman of the department.

BIOLOGY

Biology IA and IB will be available in the first year. Biology IA is a course on the biology of autotrophic organisms and fungi; Biology IB is a course in zoology. Common to both subjects is a course on genetics and evolution. These subjects qualify students for a wide range of second-year biological subjects as set out in the table in Part V. Details of second-year and subsequent studies in the School of Biological Sciences can be found under the headings *Biochemistry, Botany, Genetics, Microbiology* and *Zoology*.

Prerequisites for 1975

(a) For students enrolled in the School of Biological Sciences — a pass in chemistry and in any one subject from physics, biology or a branch of mathematics in the Victorian higher school certificate examination or an approved equivalent.

(b) For students not enrolled in the School of Biological Sciences — a pass in chemistry in the Victorian higher school certificate examination or an approved equivalent.

Class Requirements (in Biology IA and IB)

Lectures — three a week in each subject for three terms. Practical and tutorial classes — one 3-hour class a week in each subject for three terms. One excursion (Biology IB). The component of Biology IA entitled 'the biology of autotrophic organisms' and the zoological component of Biology IB each consist of 50 lectures with corresponding practical classes. The genetical component is common to both subjects and consists of 25 lectures with corresponding practical classes and tutorials.

BIOLOGY IA

This is an introductory course for students wishing to pursue more advanced biological subjects in subsequent years, but is also designed as an integrated one-year terminal course for students who do not wish to pursue a biological subject into later years of their degree. The subject contains two components.

(1) THE BIOLOGY OF AUTOTROPHIC ORGANISMS AND FUNGI (50 lectures)

Syllabus: This component is designed to introduce students to the biology of organisms which use carbon dioxide as a carbon source (i.e. plants, and various micro-organisms). Aspects of the biology of fungi are also included.

The following topics are covered: the cellular and sub-cellular structures of eucaryotic and procaryotic organisms and their reproduction. An evolutionary approach to the diversity of autotrophic organisms, their anatomy and morphology. The biology of fungi. Autotrophic nutrition.

Derivation of energy for cellular activity. Uptake and transport of metabolites. Regulation of growth and development. Competition between autotrophic organisms and adaptations to environmental stresses. The concepts of populations, communities and ecosystems; the effect of man on these systems.

Preliminary Reading: Students are assumed to have some knowledge of biology. Students whose school record does not include HSC biology are encouraged to read the following book in the long vacation before the commencement of the course:

Biological Science *The Web of Life*, 2nd edn. Written and published by Australian Academy of Science

Prescribed Reading

Raven, P.H. and Curtis, H. *The Biology of Plants*, Worth Publications Inc. Costermans, L.F. *Trees of Victoria* 3rd edn, published by the author 1973.

Students are also required to purchase a special manual for use in conjunction with practical work. The practical manual (and other equipment necessary for the practical course) will be available before the beginning of the academic year. Details will be mailed to all students enrolled for Biology IA as soon as possible after enrolment. Additional reading will be provided during the lecture course.

Assessment

- (1) Performance in practical reports, problems, tests, essays and any other assignments set throughout the year.
- (2) A written examination at the end of the course.

(2) GENETICS (25 lectures)

Syllabus: Principles of genetics; introduction to population, quantitative and human genetics; genes and metabolism; the genetic code and protein synthesis; processes of organic evolution; the nature of human variation.

Prescribed Reading: Genetics Notes by the department of genetics.

Recommended References

Stansfield, W.D. *Theory and Problems of Genetics*, Schaum's Outline Series, McGraw-Hill 1969
 Stebbins, G.L. *Processes of Organic Evolution* 2nd edn, Prentice Hall 1971

BIOLOGY IB

This course is comprised of courses in zoology (50 lectures) and genetics (25 lectures). The genetics component is the same as detailed under Biology IA. The zoology component is a basis for those students wishing to proceed to the advanced zoology courses. Although it may serve as a one-year terminal course, it is not designed as such. The components are as follows:

BOTANY

(1) ZOOLOGY (50 lectures)

Syllabus: The diversity of structure and function in the main groups of animals will be studied from an evolutionary point of view. Introductions to the physiology of mammals and to animal ecology, behaviour, embryology and reproduction will also be presented.

Prescribed Reading

Weisz, P.B. *The Science of Zoology*, McGraw-Hill

Students should obtain a set of practical notes, practical record book and a dissecting kit before the first practical, which will be held in the first week of term.

(2) GENETICS (25 lectures)

For syllabus and prescribed reading see part (2) of Biology IA.

BIOLOGY II

This is a special course for students enrolled in the School of Agriculture and consists of a selected portion of the Botany II course together with a special course in agricultural genetics given by the genetics department.

The botanical component will deal with the anatomy and physiology of vascular plants with emphasis on plant growth and development, tissue differentiation and the control of various aspects of growth by growth-regulating substances (26 lectures).

Prescribed Reading

Bidwell, R.G.S. *Plant Physiology*, Macmillan 1974

Esau, K. *Plant Anatomy*, 2nd edn, J. Wiley and Sons Inc. 1965

The genetics component will comprise various topics of specific interest to agricultural scientists, viz. genotype-environment interactions, genetic analysis of quantitative characters, selection theory, selection techniques in plants and animals, cytogenetic techniques in plant breeding, hybrid varieties and plant ecogenetics (25 lectures).

BOTANY

BOTANY II (75 lectures)

Prerequisites

1. Biology IA. 2. At least one of the following: Chemistry I, Physics I, or a branch of first-year mathematics.

Class Requirements

Lectures — three hours a week for three terms. Practical/tutorial classes — two 3-hour classes a week for three terms. A field trip of approximately

five days' duration will be held in the first or second-term vacation. This is an essential part of the practical course and reports based on it will be used in the final course assessment. It will not be possible to set alternative work.

Assessment

- (1) Performance in practical and field reports and any other assignments set throughout the year.
- (2) Three 3-hour written examinations at the conclusion of the course.

Preliminary Reading: Students are encouraged to do some reading in the long vacation prior to the commencement of the course. The following books are recommended.

Greulach, V.A. *Plant Structure and Function*, Macmillan Co., New York, Collier-Macmillan, London

Billings, W.D. *Plants, Man and the Ecosystem*, Macmillan, London 1971

SYLLABUS AND PRESCRIBED READING

- (1) Anatomy and physiology of vascular plants and emphasis on plant growth and development, tissue differentiation and the control of various aspects of growth by growth-regulating substances

Prescribed Reading

Bidwell, R.G.S. *Plant Physiology*, Macmillan 1974

Esau, K. *Plant Anatomy*, 2nd edn, J. Wiley and Sons Inc. 1965

- (2) The ecology of terrestrial plants with emphasis on their life cycles in relation to the environment and the effect of environmental and biotic factors on the distribution of individual plant species.

Prescribed Reading: None.

Recommended Reading

Billings, W.D. *Plants, Man and the Ecosystem*, Macmillan, London 1971

- (3) Aspects of the biology of fungi including soil microbiology and plant pathology.

Prescribed Reading

Deverall, B.J. *Fungal Parasitism* (Studies in Biology No. 17) Edward Arnold, London 1969

Alexopoulos, C.J. *Introductory Mycology*, 2nd edn. J. Wiley and Sons Inc. 1962

- (4) Physicochemical aspects of the water and solute relations of plant cells.

Prescribed Reading

Bidwell, R.G.S. *Plant Physiology*, Macmillan 1973

Recommended Reading

Levin, R.J. *The Living Barrier*, Heinemann

BOTANY

(5) The principles of angiosperm taxonomy. Aspects of plant variation and speciation with reference to their taxonomic description. A practical introduction to the families of flowering plants.

Prescribed Reading

Heywood, V.H. *Plant Taxonomy* (Studies in Biology No. 5) Edward Arnold, 1967

BOTANY III (100 lectures)

Prerequisite: Botany II.

Class Requirements

Lectures — four 1-hour lectures a week for three terms. Practical work — one 3-hour and one 6-hour practical class a week for three terms.

Assessment: (1) Performance in practical and field reports and any other assignments set throughout the year. (2) Written examinations at the end of the course.

Preliminary Reading: Students are encouraged to do some reading in the long vacation prior to the commencement of the course. The following books are recommended.

Harre, R. *The Method of Science*, Wykeham Publications, London 1970

Daubenmire, R. *Plant Communities*, Harper and Row, New York, 1968

SYLLABUS AND PRESCRIBED READING

(1) Plant biochemistry: bioenergetics, enzymology, intermediary metabolism of carbohydrates and lipids in plants; oxidative phosphorylation. The biochemistry of photosynthesis, nitrate reduction, nitrogen fixation and sulphate reduction.

Prescribed Reading

Hall, J.L., Flowers, T.J. and Roberts, R.M. *Plant Cell Structure and Metabolism*, Longman 1974

Recommended Reading

Goodwin, T.W. and Mercer, E.I. *Introduction to Plant Biochemistry*, Pergamon Press 1972

(2) Aspects of plant cell physiology. Membrane phenomena and the movement of water and solutes. Bioenergetics.

Prescribed Reading: None.

Clarkson, D. *Ion Transport and Cell Structure in Plants*, McGraw-Hill 1974

Recommended Reading

Levin, R.J. *The Living Barrier*, Heinemann

(3) Plant ecology, including studies of plant succession, vegetation dynamics and plant palaeogeography.

Prescribed Reading

Kershaw, K.A. *Quantitative and Dynamic Plant Ecology*, 2nd edn, Arnold, London 1973

(4) Advanced studies in the biology of fungi.

Prescribed Reading: None.

(5) The ultrastructure and function of plant cells. A survey of current views of the structure of cell membranes, the structure of cellular organelles and their ontogeny, interrelation and continuity, as well as a discussion of selected topics relating to the evolution of cellular organelles and cytological aspects of cell differentiation.

Prescribed Reading

Hall, J.L. *et al. Plant Cell Structure*, Longman 1974

(6) Development and comparative morphology of the seed plants. A detailed morphological survey of the families and genera of gymnosperms, their geographic distribution, evolution, reproduction and embryogeny. Reproduction in the angiosperms — sexual and asexual, including embryogeny, apomixis, aseptic culture of embryos and anthers. Evolutionary trends and differences between these two major groups will be evaluated.

Prescribed Reading

Sporne, K.R. *The Morphology of Gymnosperms*, Hutchinson University Library 1965

Foster, A.S. and Gifford, E.M. Jr *The Comparative Morphology of Vascular Plants*, 2nd edn, Freeman and Co. 1974

(7) Advanced taxonomy, with particular emphasis on chemical and numerical taxonomy.

Prescribed Reading: None.

(8) Advanced studies in plant physiology.

BOTANY IV (HONOURS COURSE)

A fourth-year course is available to students who have fulfilled the requirements of the B Sc degree at La Trobe or other Universities provided that their previous academic record is of a high standard. The academic record should include Botany III but graduates whose record does not include Botany III can gain admission to Botany IV provided their application is approved by the board of studies of the School of Biological Sciences. The course consists of a research project together with other prescribed work including essays and seminars. The course lasts approximately nine months beginning on 3 February 1975 .

CHEMICAL PHYSICS

POSTGRADUATE STUDIES

The department offers research programs leading to the degrees of M Sc or Ph D. Prospective candidates should consult the chairman of the department for further details.

Research is currently in progress in the following fields: the ultrastructure and anatomy of plants; aspects of the physiology, biochemistry and biophysics of plants; plant pathology; plant taxonomy and plant ecology.

CHEMICAL PHYSICS

An interdisciplinary course of study within the School of Physical Sciences, chemical physics offers a coherent program leading to the B Sc (pass) and B Sc (honours) degree.

The course is designed to provide a solid grounding in the field of chemical physics, and will serve either as a suitable training for teachers of physics or chemistry and for industrial appointments, or as an introduction to post-graduate research. In addition, the structure is such that there is more flexibility for branching towards either physics or chemistry than is otherwise possible.

Students wishing to follow this course should, in any year after the first, discuss their choice of physics, chemistry or mathematics components with the respective student advisers.

FIRST YEAR

Physics IA, Chemistry I, Mathematics IA and Mathematics IB are the subject units required for the first year of the course. This combination also leads to any second-year subject other than geology offered in the School of Physical Sciences.

SECOND YEAR

Physics IIA, Physical Sciences II and Applied Mathematics II form the recommended course units for enrolment. Because of the requirements for Applied Mathematics III the suggested composition of Physical Sciences II is: Chemistry IIA, Physical (1/3 unit), Mathematics II, PM 201, PM 202, PM 203, AM 205 (2/3 unit). This course is also suitable for students intending to major in pure physics.

An alternative course is Physics IIA, Chemistry IIA and Applied Mathematics II. With its equal emphasis on chemistry, this course also allows for a major in that subject (though committed pure chemistry majors would be advised to take Physics IIB).

THIRD YEAR

Chemical Physics III is a composite two-unit course comprising components from Physics IIIA, Chemistry III (physical), and Applied Mathematics III. It is open to students who have passed in either of the preceding courses, but those with the latter alternative will probably have to modify the applied mathematics segment. The recommended components (with credit points in brackets) are:

Physics IIIA: Nuclear Physics (2), Statistical Mechanics (2), Solid State (2), Atomic Physics (2), Laboratory (4).

Chemistry IIIA: Quantum chemistry (1), Bonding (1), Spectroscopy (1), Mass Spectroscopy (1), Diffraction methods (1), Statistical Mechanics (1), Laboratory (4).

Applied Mathematics III: Methods (6), Quantum Mechanics (4), and two of Dynamics (2), Numerical Analysis (2), Differential Equations (2).

Students who do not have the necessary prerequisites for some of these applied mathematics components may substitute others from either physics, chemistry, or in some instances Pure or Applied Mathematics II, provided the total of 36 credit points is maintained.

FOURTH YEAR

Flexibility is a feature of the honours-year course. Chemical Physics IV has a nucleus which is common for all enrolled, and the remaining components may be chosen according to the particular interests of each student. Each of the lecture courses and the research project carries the same value (in terms of percentage of the total years' mark) as they represent in the overall courses of their respective department or division, and should be chosen so that the total course value is as close as possible to 100 per cent. The common components are:

Physics IV: statistical mechanics, quantum mechanics, scattering theory.

Chemistry IV: group theory, electronic spectroscopy, reaction theory.

POSTGRADUATE STUDIES

Research programs leading to the degrees of M Sc or Ph D are available to holders of a good honours degree in chemical physics. Candidates of equivalent standing in related subjects may also be admitted. The divisions within the School co-operating in such programs are those of electron physics, physical chemistry, space physics, and in some instances applied mathematics. Degree requirements are similar to those existing in other areas of the School.

CHEMISTRY

The three departments of chemistry combine to offer courses leading to the B Sc (pass) and B Sc (honours) degrees. In the academic year 1975, Chemistry I, Chemistry IIA and IIB, Chemistry IIIA and IIIB and Chemistry IV will be available.

Courses are intended to provide a thorough and balanced training in chemistry which will serve as a satisfactory prelude either to postgraduate research, further courses in allied subjects, industrial appointments, or a career in teaching, and are organized so that a student may major solely in chemistry; jointly in chemistry and another discipline from the School of Physical Sciences; or in chemistry and either biochemistry, botany, economics, genetics, philosophy or zoology.

Students intending to proceed to the honours degree in chemistry will be selected on the basis of their performance in the pass-degree course.

CHEMISTRY I

Prerequisites: a student will normally be expected to have obtained a pass in chemistry at the higher school certificate examination or an approved equivalent, and to have reached at least leaving standard in physics and mathematics.

INORGANIC AND ANALYTICAL CHEMISTRY

Syllabus: chemistry of the more important metallic and non-metallic elements with particular reference to the periodic classification of elements; the electronic structure of atoms; the principles of valency theory and chemical bonding; introduction to the chemistry of coordination compounds, valence bond, crystal and ligand field theories; analytical chemistry; nuclear and radiochemistry.

Prescribed Books

Dickerson, R.E., Gray, H.B. and Haight, G.P. *Chemical Principles*, 2nd edn, Benjamin 1974

Christian, G.D. *Analytical Chemistry*, Xerox 1971

Recommended Books

*Basolo, F. and Johnson, R.C. *Coordination Chemistry*, Benjamin 1964

*Companion, A.L. *Chemical Bonding*, McGraw-Hill 1964

*Brescia, F., Arents, J., Meislech, H. and Turk, A. *Fundamentals of Chemistry*, Academic Press 1970

Heslop, R.B. and Wild, G.M. *S.I. Units in Chemistry: An Introduction*, Applied Science 1971

Newton, G.W.A. and Robinson, V.J. *Principles of Radiochemistry*, Macmillan 1971

*Gray, H.B. *Electrons and Chemical Bonding*, Benjamin 1965

ORGANIC CHEMISTRY

Syllabus: elementary organic chemistry, with particular reference to electronic theory and reaction mechanism; isomerism and stereochemistry; preparation and reaction of aliphatic and aromatic hydrocarbons, alcohols, halides, ethers, aldehydes, ketones, carboxylic acids and derivatives and amines.

Prescribed Book

Davis, M., Deady, L.W. and Topsom, R.D. *Introductory Organic Chemistry*, Longman 1973

PHYSICAL CHEMISTRY

Syllabus: thermodynamics, colligative properties; reaction kinetics; chemical equilibrium, ionic and heterogeneous equilibria in aqueous solutions; electrochemistry; properties of gases and kinetic theory; ions in solids, liquids and gases; atomic structure; bonding.

Prescribed Book

Dickerson, R.E., Gray, H.B. and Haight, G.P. *Chemical Principles*, W.A. Benjamin 1970

Recommended Book

Aylward, G.H. and Findlay, T.J.V. *SI Chemical Data*, Wiley 1971

LABORATORY COURSES

Syllabus: the course includes the preparation and reactions of inorganic compounds; the preparation, purification, properties and reactions of typical organic compounds, and experiments related to the physical chemistry lecture course.

All students are required to purchase a Framework Molecular Models Kit, Prentice Hall, for use in laboratory courses and tutorials.

CLASS REQUIREMENTS

Lectures — three a week for three terms.

Tutorials and Problem Classes — as arranged.

Practical — one 3-hour period per week for 3 terms.

Examinations

Theory { Inorganic and Analytical — one 1½-hour written paper.
Organic — one 1½-hour written paper.
Physical — one 3-hour written paper.

The performance of each student in the practical laboratory courses is assessed throughout the year and taken into account in determining the success of the student at the annual examinations.

CHEMISTRY IIA

Prerequisites: Chemistry I; and Physics I or a first-year mathematics unit.

CHEMISTRY

This course is intended for the student wishing to major in chemistry, and proceeding to the honours degree in chemistry, or those intending to specialize in physics, physics and chemistry, or chemistry and philosophy, jointly. The course is also suitable for students enrolled in the School of Biological Sciences.

INORGANIC AND ANALYTICAL CHEMISTRY

Syllabus: general and inorganic chemistry of the non-metallic elements; reactions in non-aqueous solvents; introduction to the inorganic solid state; hydrides of Groups V and VI; nuclear and radiochemistry; instrumental analysis.

Prescribed Books

MacKay, K.M. and MacKay, R.A. *Introduction to Modern Inorganic Chemistry*, revised edn, Intertext 1972

Christian, G.D. *Analytical Chemistry*, Xerox 1971

Recommended Books

*Duncan, J.F. and Cook, G.B. *Isotopes in Chemistry*, Clarendon Press 1968

Demitras, G.C., Russ, C.R., Salmon, J.F., Weber, J.F. and Weiss, G.S.

Inorganic Chemistry, Prentice Hall 1972

Huheey, J.E. *Principles of Structure and Reactivity*, Harper and Row 1972

Ewing, G.W. *Instrumental Methods of Chemical Analysis*, 3rd edn, McGraw-Hill 1969

Cotton, F.A. and Wilkinson, G. *Advanced Inorganic Chemistry*, 3rd edn, Interscience 1972

ORGANIC CHEMISTRY

Syllabus: physical organic chemistry; carbohydrates; amino acids, proteins; simple conformational analysis and optical activity; investigation of reaction mechanisms, S_N1 , S_N2 , S_NAr , $SEAr$; electrophilic addition to alkenes and reactions of esters.

Prescribed Book

Henrickson, J.B., Cram, D.J. and Hammond, G.S. *Organic Chemistry*, 3rd edn, McGraw-Hill, International Student Edn

Recommended Books

Gould, E.S. *Mechanism and Structure in Organic Chemistry*, Holt, Rinehart and Winston 1959

Sykes, P. *The Search for Organic Reaction Pathways*, Longman 1973

PHYSICAL CHEMISTRY

Syllabus: PC2.01 symmetry and bonding, PC2.02 spectroscopy, PC2.03 thermodynamics, PC2.04 reaction kinetics. Students enrolled in the School of Biological Sciences may take PC2.05 macromolecules, colloids and surface chemistry instead of PC2.01, and PC2.06 bioenergetics instead of PC2.03.

Prescribed Book

Daniels, F. and Alberty, R.A. *Physical Chemistry*, 3rd edn, John Wiley 1967

Recommended Books

- Aylward, G.H. and Findlay, T.J.V. *SI Chemistry Data*, Wiley 1971
 Barrow, G.M. *Physical Chemistry*, 3rd edn, McGraw-Hill 1973
 Moore, W.J. *Physical Chemistry*, 4th edn, Prentice-Hall 1972
 Gray, H.B. *Electrons and Chemical Bonding*, Benjamin 1965
 Davidson, G. *Introductory Group Theory for Chemists*, Elsevier 1971
 Barrow, G.M. *The Structure of Molecules*, Benjamin 1964
 Laidler, K.J. *Reaction Kinetics*, vols 1 and 2, Pergamon 1963
 Brescia, F., Arents, J., Meislich, H. and Turk, A. *Fundamentals of Chemistry: A Modern Introduction*, 2nd edn, Academic Pr. 1970
 Campbell, J.A. *Chemical Systems*, Freeman 1970
 Salzberg, H.W., Morrow, J.I. and Cohen, S.R. *Laboratory Course in Physical Chemistry*, Academic 1966

LABORATORY COURSES

Syllabus: the course will include inorganic preparations, reactions and techniques; advanced chemical and instrumental analysis; the preparation, purification, properties, identification and reactions of various organic compounds (emphasis will be placed on the use of modern physical and chemical techniques); a range of physical chemistry experiments, based on the second-year lecture course.

CLASS REQUIREMENTS

Lectures — Four a week for three terms.

Tutorials — as arranged.

Practical — a student taking Chemistry IIA will be required to work regularly in the laboratories for a minimum of four hours a week.

Examinations

Theory { Inorganic and Analytical— one 2-hour written paper.
 Organic— written papers throughout the year as required.
 Physical — one 1½-hour written paper per component.

The performance of each student in the practical laboratory course is assessed throughout the year and taken into account in determining the success of the student at the annual examination.

CHEMISTRY IIB

This course is suitable for students who do not intend to take further courses in chemistry. Chemistry IIB is a terminal course.

Prerequisite: Chemistry I.

INORGANIC AND ANALYTICAL CHEMISTRY

Syllabus: the principal features and descriptive inorganic chemistry of selected non-metallic and metallic elements; coordination chemistry; modern methods of separation and analysis in inorganic chemistry; elementary chemical statistics; theory and practice of radiochemistry.

CHEMISTRY

Prescribed Books

- MacKay, K.M. and MacKay, R.A. *Introduction to Modern Inorganic Chemistry*, revised edn, Intertext 1972
Christian, G.D. *Analytical Chemistry*, Xerox 1971

Recommended Books

- Huheey, J.E. *Principles of Structure and Reactivity*, Harper and Row 1972
*Duncan, J.F. and Cook, G.B. *Isotopes in Chemistry*, Clarendon Press 1968
Ewing, G.W. *Instrumental Methods of Chemical Analysis*, 3rd edn, McGraw-Hill 1969
Cotton, F.A. and Wilkinson, G. *Advanced Inorganic Chemistry*, 3rd edn, Interscience 1972

ORGANIC CHEMISTRY

Syllabus: physical organic chemistry; carbohydrates, amino acids, proteins, simple conformational analysis, optical activity; bioorganic mechanisms; natural products, biosynthesis.

Prescribed Book

- Hendrickson, J.B., Cram, D.J. and Hammond, G.S. *Organic Chemistry*, 3rd edn, McGraw-Hill, International Student Edn

PHYSICAL CHEMISTRY

Syllabus: PC2.02 spectroscopy, PC2.04 reaction kinetics, PC2.05 macromolecules, colloids and surface chemistry, PC2.06 bioenergetics. Students enrolled in the School of Agriculture take only PC2.02, PC2.04 and PC2.06.

Prescribed Book

- Daniels, F. and Alberty, R.A. *Physical Chemistry*, 3rd edn, John Wiley 1967

Recommended Books

- Aylward, G.H. and Findlay, T.J.V. *SI Chemical Data*, Wiley 1971
Barrow, G.M. *Physical Chemistry*, 3rd edn, McGraw-Hill 1973
Moore, W.J. *Physical Chemistry*, 4th edn, Prentice-Hall 1972
Laidler, K.J. *Reaction Kinetics*, vols 1 and 2, Pergamon 1963
Barrow, G.M. *The Structure of Molecules*, Benjamin 1964
Brescia, F., Arents, J., Meislich, H. and Turk, A. *Fundamentals of Chemistry: A Modern Introduction*, 2nd edn, Academic Pr. 1970
Campbell, J.A. *Chemical Systems*, Freeman 1970
Salzberg, H.W., Morrow, J.I. and Cohen, S.R. *Laboratory Course in Physical Chemistry*, Academic Pr. 1966

LABORATORY COURSES

Syllabus: the course will include inorganic preparations, reactions and techniques; advanced chemical and instrumental analysis; the preparation, purification, properties, identification and reactions of various organic

compounds (emphasis will be placed on the use of modern physical and chemical techniques); a range of physical chemistry experiments based on the second-year lecture course (emphasis will be placed on the use of modern physical and analytical techniques and on applications of thermodynamics).

CLASS REQUIREMENTS

Lectures – a course of approximately 80 lectures.

Tutorials – as arranged.

Practical – A student taking Chemistry IIB will be required to work regularly in the laboratories for four hours a week.

Examinations

Theory { Inorganic and Analytical – one 1½-hour written paper.
Organic – written papers throughout the year as required.
Physical – one 1½-hour written paper a component.

The performance of each student in the practical laboratory course is assessed through the year and taken into account in determining the success of the student at the annual examinations.

CHEMISTRY COURSES FOR PHYSICAL SCIENCES II

The sections of the chemistry courses which may be taken in Physical Sciences II are: Inorganic Chemistry IIB, Organic Chemistry IIA or IIB, and Physical Chemistry IIA or IIB.

Each may be taken singly or in combination provided that chemistry is not taken as a major subject at the second-year level. The prerequisite for each is Chemistry I and each has a value of one third of a second-year unit.

CHEMISTRY III

Two one-unit courses, Chemistry IIIA and Chemistry IIIB, will be offered.

Students taking only one unit of chemistry together with another subject will do Chemistry IIIB. Those students wishing to take two units of chemistry at the third-year level should do Chemistry IIIA and Chemistry IIIB. Chemistry IIIB must be taken before Chemistry IIIA or concurrently with it.

Prerequisite: Chemistry IIA.

INORGANIC AND ANALYTICAL CHEMISTRY

Syllabus: Chemistry IIIB students will be required to take the first four components listed below; students taking Chemistry IIIA and IIIB do all eight components:

- (1) magnetochemistry, optical activity and NMR applications,
- (2) analytical techniques in inorganic chemistry,
- (3) thermodynamics and electrochemistry,
- (4) selected topics in transition metal chemistry,

CHEMISTRY

- (5) bonding, reaction mechanisms and spectral properties of T.M. complexes,
- (6) statistics and analytical techniques e.g. TGA, DTA, zone refining,
- (7) aspects of coordination and organometallic chemistry,
- (8) bioinorganic and environmental chemistry.

Recommended Books

- Demitras, G.C., Russ, C.R., Salmon, J.F., Weber, J.H., Weiss, G.S. *Inorganic Chemistry*, Prentice Hall 1972
- Basolo, F. and Pearson, R.G. *Mechanisms of Inorganic Reactions*, Wiley 1967
- Ewing, G.W. *Instrumental Methods of Chemical Analysis*, 3rd edn, McGraw-Hill 1969
- Angelici, R.J. *Synthesis and Techniques in Inorganic Chemistry*, Saunders 1969
- Christian, G.D. *Analytical Chemistry*, Xerox 1971
- Huheey, J.E. *Principles of Structure and Reactivity*, Harper and Row 1972
- Browning, D.R. *Spectroscopy*, McGraw-Hill 1969
- Day, M.C. and Selbin, J. *Theoretical Inorganic Chemistry*, 2nd edn, Reinhold 1969
- Cotton, F.A. and Wilkinson, G. *Advanced Inorganic Chemistry*, 3rd edn, Interscience 1972

ORGANIC CHEMISTRY

Syllabus: Students taking Chemistry IIIA and IIIB will be required to take all eight components listed below; students taking Chemistry IIIB should select four options (consult with Professor Topsom if desired):

- (1) theoretical organic chemistry and free radicals,
- (2) organic mechanisms, orbital symmetry and photochemistry,
- (3) spectroscopic methods (IR, UV, NMR),
- (4) synthetic methods,
- (5) reactions of functional groups,
- (6) heteroaromatic compounds,
- (7) biological organic chemistry,
- (8) industrial organic chemistry.

Prescribed Book

- Hendrickson, J.B., Cram, D.J. and Hammond, G.S. *Organic Chemistry*, 3rd edn, McGraw-Hill, International Student Edn

Recommended Books

- Woodward, R.B. and Hoffman, R. *The Conservation of Orbital Symmetry*, Verlag Chemie 1970
- Acheson, R.M. *An Introduction to the Chemistry of Heterocyclic Compounds*, Prentice Hall 1965

PHYSICAL CHEMISTRY

Syllabus: students taking Chemistry IIIA should select four components which must include PC3.00 Computing; students taking Chemistry IIIB should select four components. Students taking Chemistry IIIA and IIIB together must select eight components including PC3.00 Computing. Students who choose to complete more than the required number of components will be assessed on their best results.

PC3.00 computing	PC3.05 diffraction methods
PC3.01 quantum chemistry	PC3.06 mass spectrometry
PC3.02 bonding theory	PC3.07 statistical mechanics
PC3.03 spectroscopy	PC3.08 macromolecules
PC3.04 reaction kinetics	PC3.09 information theory

Prescribed Book

McCracken, D.D. *A Guide to Fortran IV Programming*, Wiley 1968

Recommended Books

- Barrow, G.M. *Physical Chemistry*, 3rd edn, McGraw-Hill 1973
- Moore, W.J. *Physical Chemistry*, 4th edn, Prentice-Hall 1972
- Levine, I.N. *Quantum Chemistry*, vol. 1: *Quantum Mechanics and Molecular Electronic Structure*, Allyn and Bacon 1970 (PC3.01 and PC3.02)
- Gray, H.B. *Electrons and Chemical Bonding*, Benjamin 1965 (PC3.02)
- Davidson, G. *Introductory Group Theory for Chemists*, Elsevier 1971 (PC3.02)
- Hollas, J.M. *Symmetry in Molecules*, Chapman and Hall 1972 (PC3.03)
- Banwell, C.N. *Fundamentals of Molecular Spectroscopy*, McGraw-Hill 1966 (PC3.03)
- Dixon, R.N. *Spectroscopy and Structure*, Methuen 1965 (PC3.03)
- Laidler, K.J. *Chemical Kinetics*, 2nd edn, McGraw-Hill 1965 (PC3.04)
- Laidler, K.J. *Theories of Chemical Reaction Rates*, McGraw-Hill 1969 (PC3.04)
- Wormald, J. *Diffraction Methods*, Clarendon 1973 (PC3.05)
- Sands, D.E. *Introduction to Crystallography*, Benjamin 1969 (PC3.05)
- Johnstone, R.A.W. *Mass Spectrometry for Organic Chemists*, Cambridge 1972 (PC3.06)
- Nash, L.K. *Elements of Statistical Thermodynamics*, 2nd edn, Addison-Wesley 1972 (PC3.07)
- Brillouin, C. *Science and Information Theory*, 2nd edn, Academic 1962 (PC3.09)

CLASS REQUIREMENTS

Lectures – students taking two units of chemistry attend approximately eight lectures a week for three terms; students taking Chemistry IIIB attend about four lectures a week.

Tutorials/Seminars – as arranged.

CHEMISTRY

Practical – students taking two units of chemistry will be required to work regularly in the laboratories for a minimum of 12 hours a week; students taking Chemistry IIIB are required to do six hours a week.

Examinations

The various sections of the Chemistry III course will be examined either during the year by projects or written papers, or at the end of the year by written papers. All inorganic and analytical examinations are held at the end of the academic year in November.

CHEMISTRY COURSES FOR PHYSICAL SCIENCES III

Six segments of Chemistry III may be taken in Physical Sciences III: Inorganic Chemistry IIIA and IIIB, Organic Chemistry IIIA and IIIB, and Physical Chemistry IIIA and IIIB.

Each of the six segments may be taken singly or in combination provided that a IIIB segment is taken before the corresponding IIIA segment or concurrently with it. Each has a value of one third of a third-year unit and Physical Sciences III may be made up entirely of three segments of chemistry. The prerequisite for each course is the appropriate course from Chemistry II.

Students should note that completion of sections of the Chemistry III course in Physical Sciences III does not qualify them for admission to the honours school of chemistry, but that Physical Chemistry III may qualify them for admission to Chemical Physics IV.

CHEMISTRY IV: HONOURS COURSE

Prerequisite: normally, a grade of at least C in Chemistry IIIA and IIIB or in Chemistry IIIB and another suitable third-year subject is required.

Syllabus: the fourth-year course comprises more advanced study with lectures in all three branches: inorganic, organic, physical. All students are required to take nine units normally selected from the following list of courses, with the restriction that not less than one or more than five may be taken from those of any one group. Courses must be approved by the head of the department (inorganic and analytical, organic, physical) in which the student is undertaking the research project, and that marked with an asterisk (*) is obligatory for students undertaking the research project in inorganic chemistry. Students may, with the approval of the appropriate departmental heads, also take courses offered by other departments such as biochemistry, geology, mathematics or physics.

On the experimental side, the value of training in research is recognized. There are no formal or set experiments, but each student is required at the beginning of the fourth-year course to opt for the branch of chemistry in

which he wishes to undertake a research investigation. At the conclusion of the academic year, the student is required to write an original dissertation on the results of his work.

INORGANIC AND ANALYTICAL CHEMISTRY

**Theoretical and the Determination of Molecular Structure* (1 unit):

Elements of symmetry and group theory. Absorption spectroscopy – atomic spectra, spectroscopic terms; advanced ligand field theory (effect of crystal fields on spectroscopic terms); Orgel diagrams, Tanabe-Sugano diagrams, correlation diagrams, selection rules, band intensities, etc. Theory of magnetism. Magnetic behaviour of inorganic substances; magnetic properties of free ions; effect of crystal fields – orbital contributions; variation with temperature. Applications of molecular orbital theory in inorganic chemistry. Electron spin resonance and infrared spectroscopy of inorganic species.

Descriptive Inorganic Chemistry (1 unit): Electron deficient compounds, polyacids, carbides, nitrides, borides, tungsten bronzes, metal-sulphur chemistry, silicates, silicones, graphite, inorganic polymers.

Modern Techniques in Inorganic Analytical Chemistry (2 units): Solvent extraction, theory and application. Ion exchange, theory and application. Atomic absorption spectroscopy. Ion selective electrodes. Gas chromatography of metal chelates. Advanced electrochemical techniques.

Radiation Chemistry (1 unit): Introduction: radiation types and sources; radiolysis of water and aqueous solutions; radical and molecular products; radiation dosimetry – the Fricke dosimeter; determination of molecular and radical yields; radiation decomposition of gases; radiolysis of organic compounds; irradiation of polymers; uses of radiation chemistry.

Chemistry and Society (1 unit): Of considerable interest today in chemistry courses, is the need for relevance and indication of the great impact that chemistry has on our modern society. In this course, emphasis is placed on the application of chemistry and chemical principles to technology, ecology, the environment and the problems of society.

Stereochemistry and Reaction Mechanisms (1 unit): This course deals mainly with inter and intra-molecular rearrangements in transition and non-transition metal complex species. Topics include geometrical isomerism and equilibria in 4 and 6-coordinate species; reactions of optically active metal complexes (e.g. inversion, racemization) including a consideration of absolute configuration, conformational analysis, stereoselective and stereospecific ligands and reactions.

Instrumental Techniques in Inorganic Chemistry (1 unit): Thermodynamic techniques: Capsule and titration calorimetry. Spectroscopy techniques:

CHEMISTRY

(a) Mossbauer spectroscopy, (b) Nuclear quadrupole resonance spectroscopy.

Inorganic Biochemistry (1 unit): Background – homogeneous catalysis, amino acids, peptides, proteins and nucleotides; oxygen carriers – porphyrins, hemoglobin, myoglobin, hemerythrin and hemocyanin; Redox enzymes – iron-sulphur proteins, cytochromes b and c; nitrogen fixation – molybdoenzyme; photosynthesis – chlorophyll; coenzymes – vitamin B₁₂.

ORGANIC CHEMISTRY

Details of courses are given in the departmental brochure, available on application.

Theoretical Organic Chemistry

Physical Organic Chemistry

Organic Synthesis

Heterocyclic Chemistry

Applications of NMR Spectroscopy

Organometallic Chemistry

Biosynthesis

Drug Activity and Structure

Organic Reaction Mechanisms

PHYSICAL CHEMISTRY

PC4.01 Group Theory: elements of group theory, groups, symmetry in molecules, matrix representation of groups, character table; applications of group theory in chemistry, molecular vibration, molecular orbitals, spectroscopic selection rules.

PC4.02 Atomic Spectroscopy: spherical symmetry and the states and selection rules for atoms; radiative transitions and lifetimes of excited states; photoionization and photoelectron distributions.

PC4.03 ESR Spectroscopy: principles of magnetic resonance; experimental techniques; solution spectra; trapped radicals in solids; organic molecules in triplet states; transition metal complexes; spin relaxation and rate processes; spin-labelling of biomolecules.

PC4.04 Photoelectron Spectroscopy: theory of photoelectron spectroscopy, instrumental methods, high resolution spectra of atoms and small molecules, low resolution spectra of large molecules, chemical shift of core electron binding energy.

PC4.05 Reaction Rate Theory: kinetic theory of gases; unimolecular gas reactions at low and moderate pressures; quasi-equilibrium theory of mass spectral fragmentation; bimolecular gas reactions and collision theory; classical trajectory calculations; empirical schemes for rate calculation; quantum mechanical effects.

PC4.06 Crystallography: crystal symmetry; X-ray and neutron diffraction; diffraction theory; the phase problem; vector and Fourier methods; direct methods of structure determination; structures of large molecules; examples of crystal structure analysis.

PC4.07 Mass Spectrometry: energetics of ionization-dissociation processes; theory of mass spectra; special applications of mass spectrometry in organic and inorganic chemistry.

PC4.08 Chemical Information Theory: the mathematical basis of information theory; experiments considered as a communication situation; noise, redundancy, coding; pattern recognition; Fourier transforms; deconvolution; chemical structure codes.

CLASS REQUIREMENTS

Practical: Each student is required to work on a research problem under the supervision of a member of staff of the department in a field of his own selection (inorganic, organic, physical, analytical). At the end of the research investigation, each student is required to write and submit a dissertation.

Seminars and Colloquia: A feature of the honours course will be student seminars. All students are also expected to attend the departmental research colloquia.

Examinations: To be advised. Physical chemistry examinations will normally be held within a few weeks of completion of the relevant lecture courses. All inorganic and analytical examinations are held at the end of the academic year in November.

Prescribed and Recommended Reading

Inorganic and Analytical Chemistry: at the beginning of each lecture course, prescribed and recommended reading is advised by the lecturer concerned.

Organic Chemistry: prescribed reading to be advised for enrolling students.

Physical Chemistry: prescribed reading to be advised for enrolling students.

HONOURS PRIZE

The society of chemical industry of Victoria awards an annual prize, \$25 and a certificate, to the top student in the chemistry honours year.

POSTGRADUATE STUDIES

The department offers research programs leading to the degrees of M Sc or Ph D. For admission to candidature of the degree of Master of Science, applicants should normally have, or expect to receive the degree of Bachelor of Science with honours in chemistry from this or an accredited university. Students with high standing in general-degree courses, or who hold a diploma, certificate or qualification recognized and approved by the University as equivalent to a degree or a suitable alternative to a primary degree may be granted admission after attending a preliminary course and passing a preliminary examination.

Admission to candidature for the degree of Doctor of Philosophy may be granted to applicants who hold the degree of Master of Science from this or an accredited university, have high standing in the degree of Bachelor with honours or hold the pass degree of Bachelor and have passed a preliminary examination in this University for the degree of Master not less than one academic year after having qualified for the pass degree of Bachelor.

Both the M Sc and Ph D degrees require the submission of a thesis reporting the results of original research carried out under supervision. In certain cases, the department may be prepared to consider applications from candidates for admission to candidature for the degree of M Sc by examination. In certain circumstances, the degrees may be obtained by part-time research study.

Prospective candidates for the M Sc or Ph D degrees should write in the first instance to the professor of the department concerned for further information:

Professor R.J. Magee, head, department of inorganic and analytical chemistry.

Professor R.D. Topsom, head, department of organic chemistry.

Professor J.D. Morrison, head, department of physical chemistry.

Excellent facilities are available for research in a wide range of specialist fields:

INORGANIC AND ANALYTICAL CHEMISTRY

Preparative, spectroscopic (u.v.-visible, i.r., e.s.r., n.m.r.) and structural studies on metal chelates of transitional metals. Sulphur ligand complexes: metal xanthates, dithiocarbamates, thiocarbamates and related compounds. Electrochemistry: polarographic, cyclicvoltammetric and chronopotentiometric studies on inorganic systems. Solvent extraction studies using neutral and acidic alkyl phosphoric acid esters and high molecular weight amines. Radiation and radio-chemistry. Inorganic analytical chemistry. Magneto-chemistry of inorganic species. Gas chromatography of metal chelates. Selective ion electrode studies. Thermochemical studies on coordination compounds: titration and capsule calorimetry. Inter and intra-molecular rearrangements of four and six-coordinate transition metal complexes in solution. Design of stereo-specific ligands in four and six-coordinate metal complexes. Studies of metal complexes having biological significance. Studies of oxidation-reduction and acid-base reactions of transition metal compounds in molten salts — nitrates, nitrites and acetates of alkali metals. Synthetic and catalytic chemistry of transition metal ions. Stabilization of unstable species by transition elements. Molecular nitrogen compounds. Development of the use of contact shift measurements in rapidly exchanging systems to determine coordination structures in solution. The use of pressure to probe mechanisms of inorganic reactions.

ORGANIC CHEMISTRY

Physical organic chemistry including effects of steric and electronic factors on the reactivity and properties of aromatic and heteroaromatic compounds; theoretical and spectroscopic studies on molecular structure of organic compounds; infrared intensity studies; mechanisms of aromatic and heterocyclic reactions; solvent effects on reaction mechanisms; synthesis, reactivity and stereochemistry of aromatic molecules; chemistry of naturally occurring compounds; synthesis and properties of polycyclic hydrocarbons; mechanism of drug activity; studies in water pollution.

PHYSICAL CHEMISTRY

Determination of organic and inorganic crystal structures by X-ray diffraction.

The study of molecular energetics by examination of mass spectroscopic ionization-dissociation products. Lifetimes by molecular excited states formed by electron impact in gases.

Experimental and theoretical determination of angular distributions and energies of photoelectrons from gaseous polyatomic molecules. Energy shifts of valence electrons in absorbed molecules.

Theory of relaxation processes. Radiationless transitions, mass spectral fragmentation, unimolecular gas reactions. Self-consistent-field molecular orbital calculations on molecules containing heavy atoms.

Application of computing to mass spectrometry and the development of programs for the identification of substances from their mass spectra. The application of the GLC-MS-computer to the analysis of complex organic mixtures, for example, flavours, odours and information carrying substances. Sulphur and oxygen palaeotemperature isotope ratio measurements using mass spectrometric techniques.

Kinetics and mechanism of gas phase free radical reactions including recombination of radicals using intermittent illumination, measurement of Arrhenius parameters and deuterium isotope effects for hydrogen abstraction reactions, and theoretical rate calculations by the BEBO and LEPS method.

ECONOMICS

For details see Vol I of the Handbook containing disciplines offered by the School of Social Sciences.

EDUCATION

For details see Vol 1 of the Handbook containing subjects offered by the School of Education.

GENETICS

GENETICS II

A general course based on the genetical and evolutionary section of Biology IA and IB. It is divided into six units of equal length: analytical genetics, introductory cytogenetics, population and quantitative genetics, human biology, biochemical genetics and microbial genetics.

The course is both complete in itself, and serves as an introduction to Genetics III, since it covers all the major areas of genetics and related disciplines at a higher level than in Biology IA and IB. Disciplines which are recommended to be taken with Genetics II, include mathematics, statistics, biochemistry, botany, microbiology and zoology.

A formal examination will be held following the completion of the first two units of the course. It is possible that a second examination may be held during the later part of the course.

Prerequisites

- (1) Biology IA and IB, but in special circumstances one of these subjects is sufficient.
- (2) A minimum of one of Chemistry I, Physics I, and a branch of first-year mathematics.

Recommended Reading

Srb, A.M., Owen, R.D. and Edgar, R.S. *General Genetics*, 2nd edn, Freeman 1965

Harrison, G.A., Weiner, J.S., Tanner, J.M. and Barnicot, N.A. *Human Biology: An Introduction to Human Evolution, Variation and Growth*, Clarendon Pr., Oxford 1964

Recommended References

Davis, B.D., Dulbecco, R., Ginsberg, H.S., Eisen, H.N. and Wood, W.B. *Principles of Microbiology and Immunology*, Harper and Row 1968

Falconer, D.S. *Introduction to Quantitative Genetics*, Oliver and Boyd 1960

Goodenough, U. and Levine, R.P. *Genetics*, Holt, Rinehart and Winston 1974

Mettler, L.E. and Gregg, T.G. *Population Genetics and Evolution*, Prentice Hall 1969

Parsons, P.A. *The Genetic Analysis of Behaviour*, Methuen 1967

Sinnott, E.W., Dunn, L.C. and Dobzhansky, T. *Principles of Genetics*, McGraw-Hill 1958

Stansfield, W.D. *Theory and Problems of Genetics*, Schaum's Outline Series, McGraw-Hill 1969

Stent, G. *Molecular Genetics*, Freeman 1971

- Strickberger, M.W. *Genetics*, Macmillan 1968
 Sokal, R. and Rohlf, F.S. *Introduction to Biostatistics*, Freeman 1973
 Whitehouse, H.K.L. *Towards an Understanding of the Mechanism of Heredity*, 3rd edn, Edward Arnold 1973

GENETICS III

An advanced course based on Genetics II as a prerequisite. The course will consist of: microbial, molecular, and developmental genetics (30 lectures); behavioural, ecological, quantitative and population genetics (30 lectures); recombination (20 lectures); an optional unit (20 lectures), either the genetic basis of behaviour or gene expression in eukaryotes.

Recommended Reading

- Du Praw, E.J. *DNA and Chromosomes*, Holt, Rinehart and Winston 1970
 Markett, C.L. and Ursprung, H. *Developmental Genetics*, Prentice Hall 1971
 Parsons, P.A. *Behavioural and Ecological Genetics: a Study in Drosophila*, Oxford 1973
 Watson, J.D. *Molecular Biology of the Gene*, 2nd edn, Benjamin 1970

Recommended References

- Briggs, D. and Walters, S.M. *Plant Variation and Evolution*, Weidenfeld and Nicholson 1969
 Denenberg, V. *The Development of Behaviour*, Sinauer 1972 (behaviour option)
 Du Praw, E.J. *Cell and Molecular Biology*, Academic Pr. 1968
 Falconer, D.S. *Introduction to Quantitative Genetics*, Oliver and Boyd 1960
 Goodenough, U. and Levine, R.P. *Genetics*, Holt, Rinehart and Winston 1974
 Hayes, W. *The Genetics of Bacteria and their Viruses*, 2nd edn, Blackwell 1968
 Lawrence, C.W. *Cellular Radiobiology*, Arnold 1971
 Mather, K. and Jinks, J.L. *Biometrical Genetics*, Chapman and Hall 1971
 Mettler, L.E. and Gregg, T.G. *Population Genetics and Evolution*, Prentice Hall 1969
 Wallace, B. *Topics in Population Genetics*, Norton 1968

HONOURS

The course will consist of a special research project, essays, prescribed reading courses, and such other work as may be required by the chairman of the department. Graduates from other universities will be admitted if they are of adequate standard. Students intending to do honours should consult the chairman of the department.

POSTGRADUATE STUDIES

M Sc and Ph D (by research)

Prospective candidates should consult the chairman of the department for further details. Research is currently in progress in the following fields:

- (1) behavioural, ecological and physiological genetics of *Drosophila* and mice,
- (2) quantitative genetics of *Drosophila* and man,
- (3) biochemical genetics of *Drosophila*,
- (4) population genetic studies with Australian native plants and cytogenetics of grasshoppers,
- (5) radiobiology and radiation genetics in *Drosophila*, grasshoppers and bacteria,
- (6) physical anthropology of Australian Aborigines, and human variation in local and Aboriginal populations,
- (7) microbial genetics (bacteria and fungi),
- (8) development genetics.

M Sc (by examination in applied genetics)

A course in applied genetics will be offered for those with an honours degree or its equivalent in science, agriculture or medicine. The purpose of the course is to provide training in one or more of the following fields from the applied point of view:

- (1) animal and plant breeding,
- (2) human genetics and physical anthropology,
- (3) microbial genetics,
- (4) radiobiology.

The course consists of advanced lectures, essays, and prescribed reading in one or more of the above topics, together with a small project and such other work as may be required by the chairman of the department. In the case of candidates with a background deficient in genetics, preliminary reading will be prescribed by the chairman of the department. The duration of the course is normally 10 months.

Those interested in the above course will be considered for 1975, but it is possible that not all of the above fields will be available in 1975. Intending candidates should consult the chairman of the department.

GEOLOGY

GEOLOGY, CULTURE AND THE ENVIRONMENT

For twenty years Australia has had a succession of mineral 'booms'. The last one not only led to an extraordinary demand for trained geologists but it also showed that all Australians need to have an elementary knowledge of geology. The need for geology as a cultural subject is highlighted by the estimate that Australia's export earnings for 1980 from minerals and mineral products alone will exceed the record total export earnings for 1971-1972 (\$1,289 million). Apart from economic aspects geology provides an understanding of the environment in which we live.

Geology I is a suitable course for those in other schools (including humanities) wishing to take some science subjects.

MAJORS IN GEOLOGY

Geology draws heavily on other branches of science and hence the main aim of the La Trobe geology department is to provide courses that give a fundamental grounding in geology as well as allowing sufficient time in the undergraduate years for a student to obtain a sound grasp of science in general. Students intending to graduate in geology will normally take one of physics, chemistry or mathematics as well as geology to the third-year level.

Typical courses for those intending to take a geology major within the School of Physical Sciences for the B Sc (pass) and B Sc honours degrees are:

- (1) *First Year* : Geology I, Chemistry I, Physics I, Mathematics IA.
- Second Year* : Geology II, Chemistry IIB, Physics II, (or Mathematics II or Physical Sciences II).
- Third Year* : Geology III, Chemistry IIIB.
- (2) *First Year* : Geology I, Chemistry I, Mathematics IA, Mathematics IB.
- Second Year* : Geology II, Chemistry IIB, Mathematics II.
- Third Year* : Geology III, Chemistry IIIB (or Physical Science III).
- (3) *First Year* : Geology I, Chemistry I, Mathematics IA, Physics IA.
- Second Year* : Geology II, Physics IIA, Mathematics II.
- Third Year* : Geology III, Physics III (or Physical Science III).

POSTGRADUATE GEOLOGY

Applications will be considered from suitably qualified students wishing to take postgraduate studies leading to the M Sc and Ph D degrees.

Preference will be given to those applicants wishing to do postgraduate work in the various fields of geochemistry.

GEOLOGY I

Prerequisites: there are no prerequisites for Geology I. No previous knowledge of geology is assumed. Those going on in geology will normally be expected

to have obtained a pass in either chemistry or physics at the higher school certificate or an approved equivalent.

Syllabus: Fossils and the concept of geologic time. Evolution of the planets. Cross composition of earth shells (crust, mantle, core). Crystals and minerals with special reference to silicate mineralogy. Volcanoes and igneous rocks. Sedimentary rocks and stratigraphy. Metamorphic rocks. Ore deposits. Structural geology (faults, folds etc.) and geologic maps. Plate theory of the earth: palaeomagnetism — polar wandering and magnetic reversals, continental drift. Earth history in the plate theory context.

Class Requirements: three lectures and one 3-hour practical period a week for three terms. Attendance at three field classes held on the following days are an essential part of the course: these field classes are given in place of tutorial classes and are compulsory.

Saturday (whole day), 22 March 1975, Batesford limestone quarry.

Saturday (morning), 12 July 1975, Bulla or South Morang.

Sunday (whole day), 7 September 1975, Anakies and Werribbee Gorge.

Prescribed Reading

Verhoogen, J., Turner, F.J., Weiss, L., Wahrhaftig, C. and Fyfe, W.S. *The Earth: an Introduction to Physical Geology*, Holt, Rinehart and Winston

*Dana, E.S. (Hurlbut) *Manual of Mineralogy*, Wiley

Reference Books: the following are referred to in lectures from time to time: Badgley, P.C. *Structural Methods for the Exploration Geologist*, Harper 1959

*Clark, S.P. *Structure of the Earth*, Prentice-Hall 1971

*Eicher, D.L. *Geologic Time*, Prentice-Hall 1968

*Gass, I.G., Smith, P.J. and Wilson, R.C.L. (Eds) *Understanding the Earth*, Artimis Pr. 1971

Garrels, R.M. and MacKenzie, F.T. *Evolution of Sedimentary Rocks*, Norton 1971

*Hills, E.S. *Elements of Structural Geology*, 2nd edn, Science 1972

Pettijohn, F.J. *Sedimentary Rocks*, 2nd edn, Harper 1957

Phillips, F.C. *The Use of Stereographic Projection in Structural Geology*, Arnold 1954

Stacey, F.D. *Physics of the Earth*, Wiley 1969

Wedepohl, K.H. *Geochemistry*, Holt, Rinehart and Winston 1971

*Wilson, J.T. (Ed) *Continents Adrift*, Readings from Scientific American, Freeman 1971

Examinations

One 3-hour written paper to be arranged by administration: practical examination (2 hours) to be arranged by the department.

Students may accept their average through-the-year mark as their final

examination mark. This means that candidates who have passed all examinations and practical tests through the year need not sit for the final examination unless that candidate wishes to try to improve his mark.

In all assessments 60 per cent is given for theory, 30 per cent for practical examination and 10 per cent for practical assignments conducted during the year.

GEOLOGY II

Prerequisites: Geology I is normally required. Students taking the crystal optics part of the course only, should have passed in either Geology I, Physics I or Chemistry I. The four courses listed below, together constitute a full course in Geology II: all are required by those students wishing to proceed to third year.

CRYSTAL OPTICS – TRANSPARENT AND OPAQUE MATERIALS (3 credit points)

Syllabus: polarized light; isotropic and anisotropic media, the polarizing microscope; refractive index measurement by immersion and mineral identification; interference of light; the uniaxial and biaxial indicatrix; orthoscopic and conosopic examination of uniaxial and biaxial crystals; interference figures. Practical applications of optical crystallography, particularly in mineralogy.

Vertical illumination in the study of opaque materials. Mineragraphy including hardness, reflectivity, colour anisotropism and chemical etch tests.

Prescribed Reading

Bloss, D.F. *An Introduction to the Methods of Optical Crystallography*, Holt, Rinehart and Winston 1961

Cameron, E.N. *Ore Microscopy*, Wiley 1966

Deer, W.A., Howie, R.A. and Zussman, J. *An Introduction to Rock Forming Minerals*, 1966

Heinrich, E.W. *Microscopic Identification of Minerals*, McGraw Hill 1965

IGNEOUS PETROLOGY (3 credit points)

Syllabus: a study of those rocks formed from silicate melts, with particular reference to their chemical composition and mineral phase relationships. Classification of rocks according to their occurrence in space and time; phase equilibrium of silicate melts; optical study of igneous rocks in thin section; ore deposits of igneous origin; structural relationships of igneous rocks.

Prescribed Reading

Joplin, G.A. *A Petrography of Australian Igneous Rocks*, Angus and Robertson 1971

METAMORPHIC PETROLOGY (3 credit points)

Syllabus: a study of those rocks that have crystallized or recrystallized in the solid state. Discussions of the thermal, baric and chemical parameters affecting metamorphic rocks; graphical analysis; subsolidus phase relations. Metamorphism in space and time. The geological sources of heat and pressure. The optical study of suites of metamorphic rocks, well studied regional, contact and metasomatic environments. The spatial investigation of particular metamorphic terrains in southern Australia. Ore deposits associated with metamorphic rocks.

Prescribed Reading

Turner, F.J. *Metamorphic Petrology*, McGraw-Hill 1968

Joplin, G.A. *A Petrography of Australian Metamorphic Rocks*, Angus and Robertson 1967

Sobolev, V.S. (Ed.) *The Facies of Metamorphism*

SEDIMENTOLOGY

Syllabus: analysis of ancient sedimentary environments approached by applying knowledge of modern environments of deposition to those preserved in the geological record. The genesis and characteristics of clastic sediments, evaporites, and carbonate sediments. Evolution of crust, oceans and atmosphere and the consequences of this evolution on environments of deposition through time.

Reference Books

Blatt, H., Middleton, G. and Murray, R. *Origin of Sedimentary Rocks*, Prentice-Hall 1972

Folk, R.L. *Petrology of Sedimentary Rocks*, Hemphills 1965

Garrels, R.M. and MacKenzie, F.T. *Evolution of Sedimentary Rocks*, Norton 1971

Krumbein, W.C. and Graybill, F.A. *An Introduction to Statistical Models in Geology*, McGraw-Hill 1965

Pettijohn, F.J. *Sedimentary Rocks* 2nd edn, Harper 1957

Class Requirements: three lectures and two 3-hour practical sessions for the whole year. The following compulsory field work is also required.

(1) A field mapping camp, 9 to 14 August, for those doing the whole of Geology II.

(2) Igneous petrology course. Weekend excursion to western districts volcanoes, 21 and 22 June.

(3) Metamorphic petrology. Weekend excursion to Tallangatta, 26 and 27 July.

(4) Sedimentology. Weekend excursion, 13 and 14 September.

Examinations: theory and practical examinations will be held at the end of each course. Students gaining passes in all of these examinations need not sit for the final examinations (two 3-hour written papers and practical) unless they wish to improve their grades.

GEOLOGY III

FIELD GEOLOGY (4 credit points)

Syllabus

(1) *Camp.* Nine-day field-mapping camp before term starts, 28 February to 9 March. (10 per cent)

(2) *Mapping Project.* Each student will be allocated a field mapping problem by a staff supervisor at the beginning of the academic year. The report is to be submitted in final form on 4 August 1975.

The project will include at least five days of field work to be undertaken during the Easter and May vacation, the preparation of a base map, photogrammetry and preparation of thin sections. (50 per cent)

(3) *Sedimentary Project.* Approximately seven days field and laboratory work to be undertaken in May. (40 per cent)

Assessment: there will be no formal examination. Marks will be allotted for the field maps, and reports produced.

THERMODYNAMICS AND PHASE EQUILIBRIA FOR GEOLOGISTS (3 credit points)

Basic thermodynamics and its relation to mineral systems; activity, fugacity and chemical potential and their bearing on phase diagrams; unary, binary and ternary systems involving complete, partial and no solid solution between phases; activity — activity, activity — fugacity, temperature — activity, etc. diagrams and their use in understanding sedimentary, metamorphic and igneous rocks.

Reference Books

Garrels, R.M. and Christ, C.L. *Solution, Minerals and Equilibria*, Harper and Rowe 1965

Wall, T.F. *Chemical Thermodynamics*, Freeman 1964

IGNEOUS PETROGENESIS (2 credit points)

Theoretical igneous petrology with particular reference to experimentation. Simple condensed systems and origin of magmas in the crust. High pressure studies and origin of magmas in the mantle.

Reference Books

Wyllie, P.J. *The Dynamic Earth: Textbook in Geosciences*, (especially Chapter 8) Wiley 1971

*Bowen, N.L. *Evolution of the Igneous Rocks*, Dover 1956

GEOLOGY

ISOTOPE GEOLOGY (3 credit points)

Syllabus: use of isotopes as tracers of geological processes and as sources of quantitative information via geochronology and geothermometry. Theory of the Rb-Sr, U-Pb and K-Ar decay schemes. Critical interpretation of geochronological results detailed for the Rb-Sr system. Isotopic evolution of Sr and Pb throughout earth history: meteorites and the age of the earth; chemical differentiation within the earth; isotopic parameters of modern igneous rocks, their bearing on petrogenetic theory and relevance to global tectonics. Stable isotope systems; oxygen as a tracer and geothermometer.

Reference Books

Barnes, H.L. *Geochemistry of Hydrothermal Ore Deposits*, Holt, Rinehart and Winston 1967

Doe, B.R. *Lead Isotopes*, Springer-Verlag 1970

Faure, G. and Powell, J.L. *Strontium Isotope Geology*, Springer-Verlag 1972

Hamilton, E.I. and Farquhar, R.M. *Radiometric Data for Geologists*, Interscience 1968

SOLUTION GEOCHEMISTRY AND ORE DEPOSITS (3 credit points)

Syllabus: the interaction of solids and solutions in hydrothermal and metamorphic environments. Solubilities of minerals. Review of experimental work affecting the formation of carbonates, silicates and sulphides. The study of well-documented samples of fluid inclusions in minerals and drilled hydrothermal systems, hydrothermal steam generation, solution geochemistry and the formation of vein and skarn type mineral deposits.

Reference Books

Barnes, H.L. Ed. *Geochemistry of Hydrothermal Ore Deposits*, Holt, Rinehart and Winston 1967

Garrels, R.M. and Christ, C.L. *Solution, Minerals and Equilibria*, Harper and Rowe 1965

Garrels, R.M. and Christ, C.L. *Evolution of Sedimentary Rocks*, Norton 1971

Helgeson, H.C. *Solution, Chemistry and Metamorphism*, (in *Researches in Geochemistry*, v.2, P.H. Abelson Ed. Wiley 1967

Krauskopf, K.B. *Introduction to Geochemistry*, McGraw-Hill 1967

ADVANCED STRUCTURAL ANALYSIS OF ROCKS (1 credit point)

Structures in metamorphic rocks. Multiple deformation structures. Advanced exercises involving stereographic and equal area projections.

Reference Book

Ramsay, J.F. *Folding and Fracturing of Rocks*, McGraw-Hill 1967

SEDIMENTARY ROCKS AND ORE DEPOSITS (2 credit points)

Chemical sediments. Sedimentary processes in time – historical geology. Sedimentary ore deposits – iron ores. Sedimentary Cu-U ores.

Reference Book

Garrels, R.M. and Christ, C.L. *Evolution of Sedimentary Rocks*, Norton 1971

Class Requirements for Geology III

A total of 10 formal teaching hours per week including at least six hours of practical work.

Examinations

Field geology will be examined by assessment of field mapping and reports. Other courses will either be examined during the year or at the end of the year. For all courses except field geology allocation of marks will be: laboratory assignments, 40 per cent, and formal examinations 60 per cent.

GEOLOGY IV (Honours)**Prerequisites**

Entrance to honours courses is by invitation only. Those students who have qualified for an ordinary B Sc with a C pass or better in Geology III, will automatically receive an invitation as soon as the 1974 results are available. Normally qualifications for ordinary B Sc must be obtained within four years of initial enrolment.

Students gaining D passes may be invited to enrol but this will be at the discretion of the department: complete undergraduate records will be taken into account before invitations to D pass students are made.

COURSEWORK (10 credit points)

Courses in igneous and metamorphic petrology, geochemistry, sedimentology and genesis will be available in 1975. Other courses will be added in future years. Some students will be required to take courses in other departments. Course work including seminars will be assigned by a course supervisor nominated by the chairman.

PROJECT (10 credit points)

A research project on some simple geological problem is required. The project will be selected by a course supervisor in conjunction with the student.

Examinations: three 3-hour written papers or equivalent term papers will be given to examine course work. The project will be examined by a thesis and oral.

PHYSICAL SCIENCES II**GEOLOGY**

Crystal optics, 3 credit points, may be taken by itself or crystal optics together with igneous petrology or metamorphic petrology or sedimentology may be taken for 6 credit points.

PHYSICAL SCIENCES III

GEOLOGY

Geology II is recommended as a prerequisite for any course taken from those listed for Geology III. Field Geology is only available to those students taking a full course so that the following will be available to those students taking Physical Sciences III:

isotope geology, 3 credit points;

solution geochemistry and ore deposits, 3 credit points;

igneous petrogenesis, 2 credit points;

thermodynamics and phase equilibria for geologists, 3 credit points;

advanced structural analysis of rocks, 1 credit point;

sedimentary rocks and ore deposits, 2 credit points.

MATHEMATICS

A student who wishes to major in mathematics may do so in any one of the Schools of Humanities, Physical Sciences and Social Sciences. Which School such a student will seek to enter depends partly upon his preferences so far as supporting subjects (and possible alternative majors) are concerned. He will also need to take into account the way the different regulations of these Schools affect the choice and flexibility of the mathematics subjects he may wish to choose.

Subjects available in 1975 are Mathematics IA, IB and IC, Pure Mathematics II, III and IV, Applied Mathematics II, III and IV, Mathematical Statistics II, III and IV, and Computer Science III. There are three mathematics departments, namely pure mathematics, applied mathematics and mathematical statistics. In most cases a subject is taught by one of these departments, however the first-year mathematics are the joint responsibility of all three departments.

The main feature of mathematics subjects at second and third-year level is the choice allowed each student in planning his syllabus. This is achieved by dividing each subject into a number of components; students are allowed some degree of freedom in choosing their components, in taking some third-year components in second year and vice-versa, and in taking some of their components outside the subject in which they are formally enrolled. The choice is necessarily restricted in second year, where many components are compulsory, but a wider choice will be available in third year.

Students wishing to obtain an honours degree in mathematics must complete one of the subjects Pure Mathematics IV, Applied Mathematics IV or Mathematical Statistics IV. In addition to course work and examinations in these subjects each student must write a thesis, the assessment of which will count towards his final result.

FIRST-YEAR SUBJECTS

Mathematics IA, IB and IC

The subjects offered in first year are Mathematics IA, Mathematics IB and Mathematics IC. Students intending to continue with mathematics beyond first year are strongly advised to take both Mathematics IA and Mathematics IB although students who perform sufficiently well in Mathematics IA (a grade of C or better) are permitted to take any second-year Mathematics subject. Mathematics IC is a terminal course and is incompatible with both Mathematics IA and Mathematics IB.

Students enrolled in the School of Physical Sciences wishing to take only one unit of mathematics must take Mathematics IA. All students taking Mathematics IB are required to take Mathematics IA concurrently unless they already have credit for it.

All students who have passed two of the higher school certificate examinations in pure mathematics, applied mathematics or general mathematics or who have passed one of them with a grade of C or higher should enrol in Mathematics IA rather than Mathematics IC.

Mathematics IA is an introductory course dealing with topics selected from calculus, linear algebra, computer programming – probability theory, modern algebra and mathematical models. About 110 lectures; plus one example class a week.

Mathematics IB is a mathematics course extending the ideas developed in Mathematics IA. The syllabus includes topics selected from mathematical methods, numerical analysis, mechanics, modern analysis, and statistics. About 100 lectures; plus one example class a week.

Mathematics IC is designed principally to meet the requirements of students who have done little or no mathematics at the higher school certificate level. It may also be useful to those seeking a general introductory course in mathematics.

Students should note that Physical Sciences IT is available to students not in the School of Physical Sciences.

PREREQUISITES FOR FIRST-YEAR MATHEMATICS

While there are no formal prerequisites for any first-year mathematics subject, students are warned that the levels of the subjects are determined under the assumptions that:

- (1) Each student enrolled in Mathematics IA has passed the higher school certificate examination in pure mathematics or applied mathematics or general mathematics.
- (2) Each student enrolled in Mathematics IB has passed the higher school certificate examination in pure mathematics or applied mathematics or

MATHEMATICS

general mathematics and is either currently enrolled in or has already gained credit for Mathematics IA.

(3) Each student enrolled in Mathematics IC has a good knowledge of calculus at fifth-form level.

Students in the School of Physical Sciences must take Mathematics IA rather than Mathematics IC, with Mathematics IB as an optional additional unit.

PREREQUISITES FOR SECOND AND THIRD-YEAR MATHEMATICS

Students intending to take second-year mathematics subjects should note that:

(a) It is strongly recommended that students take both Mathematics IA and IB.

(b) Students who attain a satisfactory level of competence (a grade C or better) in Mathematics IA alone are permitted to take any second-year mathematics subjects, however it should be noted that there are several components (AM205, AM207, AM208, AM212, AM306, AM314) for which Mathematics IB is a prerequisite.

Students intending to take Mathematical Statistics III are strongly advised to take Pure Mathematics II.

Students intending to do Applied Mathematics III must pass Applied Mathematics II and are recommended to take Pure Mathematics II also.

In special cases prerequisites may be waived by the chairman of the appropriate mathematics department.

SYLLABUS FOR MATHEMATICS IA AND IB

First Term

calculus	linear algebra (vectors, matrices)	computer programm- ing	computers mathematical methods
----------	---------------------------------------	------------------------------	-----------------------------------

Second Term

calculus	probability	numerical analysis	mechanics
----------	-------------	-----------------------	-----------

Third Term

modern algebra	mathematical methods	mathematical statistics	modern analysis
-------------------	-------------------------	----------------------------	--------------------

Mathematics IA: shaded. Mathematics IB: the remainder.

Each large block represents two lectures a week for one term. In addition there is one example class a week in each of the two subjects.

SYLLABUS FOR MATHEMATICS IC

Topics in finite mathematics, linear algebra, elementary programming, and

some systematic calculus. Ideas and methods of mathematical statistics and the interpretation and design of experimental techniques.

There are five class hours a week in Mathematics IC, including tutorials, and regular written exercises.

Examination requirements and assessment in each subject: six hours of written examinations. The results of written exercises and tests given during the year will be taken into account in the final assessment.

SECOND-YEAR SUBJECTS

Pure Mathematics II, Applied Mathematics II and Mathematical Statistics II

Three mathematics subjects are offered at the second-year level, namely Pure Mathematics II, Applied Mathematics II and Mathematical Statistics II. The lecture course in each subject is divided up into a number of components, each with a value expressed in terms of credit points, and students are allowed some measure of freedom in their choice of components. Subject to the restrictions listed below, a student taking one mathematics subject must select components totalling at least 12 credit points, for two mathematics subjects at least 24 credit points, and for three mathematics subjects at least 36 credit points. The restrictions applying in the various subjects are:

Pure Mathematics II: Components PM201, PM203 and PM204 are compulsory. PM202 is a prerequisite for Pure Mathematics III.

Applied Mathematics II: Components AM201, AM202, AM203 are compulsory.

Mathematical Statistics III: Components ST201 and ST202 are compulsory.

To exemplify the above rules, the following is an allowable selection of components for a student enrolled in Pure Mathematics II: PM201, PM202, PM203, PM204, AM202, ST206.

Advisers will be available within the mathematics departments at times to be arranged to assist students in making their choice of components.

Students should note that the subject Physical Sciences II is available. A student enrolled in this subject may select various second-year mathematics components to make up some or all of his workload in this subject.

PREREQUISITES

These are shown in the following table. In each case the appropriate prerequisite must be passed at a standard determined by the chairman of the appropriate mathematics department. Students will be notified with their examination results if they have not reached this standard.

Subject	Prerequisite
Applied Mathematics II	Mathematics IA
Pure Mathematics II	Mathematics IA
Mathematical Statistics II	Mathematics IA

In addition to the subject prerequisites given above, note that each of the components listed below has its own prerequisites. These may be either a first-year subject or another second-year component or both.

In special cases prerequisites may be waived by the chairman of the appropriate mathematics department.

Students intending to take third-year subjects should consult the prerequisites for those subjects and the relevant components before choosing their second-year components. Students intending to take Applied Mathematics III must pass Applied Mathematics II and are recommended to take Pure Mathematics II also. Students intending to take Mathematical Statistics III should take Mathematical Statistics II and are strongly recommended to take Pure Mathematics II also. Students intending to take Computer Science III are recommended to take AM205.

Students intending to take final honours in mathematics must pass the subject Pure Mathematics II, and should also consult the prerequisites for final honours-year components.

PRELIMINARY AND PRESCRIBED READING

A list of books for preliminary and prescribed reading will be handed out to all students at the end of 1974. Further prescribed reading in various components may be given during the lectures in these components.

COMPONENTS AVAILABLE

The components available for 1975 are listed below. Each department may cancel any component in which insufficient interest is shown, or may offer further components. The letters in the code indicate whether the component is taught by the department of pure mathematics (PM), applied mathematics (AM), or mathematical statistics (ST).

The components in pure mathematics are normally offered as follows:

Term 1: PM201 and PM203

Term 2: PM202, PM204 and PM205

Term 3: PM206, PM207, PM209 and PM210

PM208 is normally given in term 1 and the first three weeks of term 2.

PM201 Analysis A two credit points. Prerequisite: Mathematics IA.

Foundations of elementary calculus: concepts of convergence of sequences, limits and continuity of real functions; basic limit theorems. Nested intervals, Cauchy sequences, global properties of continuous functions.

PM202 Analysis B two credit points. Prerequisites: PM201, PM203.

The ideas of convergence and continuity, will be developed in a more general context than that of PM201. This will be achieved by the introduction of metric and topological spaces.

PM203 Linear Algebra two credit points. Prerequisite: Mathematics IA. Finite dimensional vector spaces. Linear transformations and matrices. The dual space. Characteristic and minimal polynomials. The primary decomposition theorem. Bilinear forms.

PM204 Abstract Algebra A two credit points. Prerequisite: Mathematics IA. Introduction to groups and rings. Homomorphisms, normal subgroups and ideals, homomorphism theorems. Integral domains and fields. Congruences.

PM205 Linear Programming two credit points. Prerequisite: Mathematics IA. Linear inequalities. Duality. Simplex computations. Matrix games.

PM206 Abstract Algebra B two credit points. Prerequisite: PM204. A continuation of PM204. Commutative rings, leading to field extensions. Ruler and compass constructions. Finite abelian groups.

PM207 Lattice Theory two credit points. An introduction to partially ordered sets and lattices, including Boolean, distributive and Brouwerian lattices. This component may not be offered in 1975.

PM208 Formal Logic four credit points. Prerequisite: Mathematics IA. This component is identical with Philosophy IIFA/IIIFA. Introduction to truth-functional and quantificational logic. An examination of some fundamental concepts of logic.

PM209 Introduction to Advanced Calculus two credit points. Prerequisite: PM202. Differentiation of maps between normed vector spaces, modern version of the chain rule. Computational recipes in finite dimensional spaces: componentwise differentiability, partial derivatives, Jacobian matrices.

PM210 Geometry two credit points. Prerequisite: Mathematics IA. Some simple propositions of ordered geometry, namely affine and absolute geometries, are introduced. This component may not be offered in 1975.

The components in applied mathematics are likely to be offered as follows:

Term 1: AM201, AM202, AM206, AM207, AM210

Term 2: AM205, AM208, AM209, AM210

Term 3: AM204, AM211, AM212

AM203 is likely to be given by one lecture a week in term 2 and continued in term 3.

AM201 Mathematical Methods two credit points. Prerequisite: Mathematics IA. Summation of series. Difference equations. Functions of several variables, including partial differentiation, maxima and minima, Taylor's theorem, double integrals. Matrix techniques. Applications.

AM202 Ordinary Differential Equations two credit points. Prerequisite: Mathematics IA. Standard methods of integration of differential equations. Theory, methods of solution and applications of linear differential equations. Special functions.

AM203 Partial Differential Equations two credit points. Prerequisite: Mathematics IA. First and second-order linear partial differential equations. Classification and methods of solution. Fourier series. Equations arising in physical, biological and social sciences.

AM204 Vectors two credit points. Prerequisite: Mathematics IA. Linear independence and vector spaces. Grad, div and curl. Integral theorems. Differential geometry of curves. Applications.

AM205 Numerical Analysis two credit points. Prerequisite: Mathematics IB; AM206 is desirable but not essential. A knowledge of elementary *Fortran* programming will be assumed.

Elementary error analysis. Solution of systems of linear algebraic equations and ordinary differential equations.

AM206 Computer Organization and Programming two credit points. Prerequisite: Mathematics IA.

Fortran programming. Programming techniques. Assembly languages. Operating systems. Basic components and structure of digital computers.

AM207 Mechanics A two credit points. Prerequisite: Mathematics IB. Mechanics of particles. Motion of planets and satellites.

AM208 Mechanics B two credit points. Prerequisite: Mathematics IB. Statics and dynamics of rigid bodies. Lagrange's equations.

AM209 Linear Programming two credit points. Prerequisites: Mathematics IA. This component is identical with PM205.

AM210 Inequalities and Optimization two credit points. Prerequisite: Mathematics IA. Convex sets and functions. Applications of inequalities. Introduction to optimization.

***AM211 Mathematical Ideas in Biology** two credit points. Prerequisite: Mathematics IA. Mathematical models for regulatory mechanisms in individual animals, animal populations and complete ecosystems.

***AM212 Wave Propagation** two credit points. Prerequisites: Mathematics IB, AM203.

Vibrating systems. Propagation in continuous media. Reflection and transmission. Dispersion. Wave packets.

* to be given only if the demand is sufficient.

The components in mathematical statistics are normally offered as follows:

Term 1 ST201 and ST207

Term 2 ST202 and ST204 or ST206

Term 3 ST203, ST205 and ST208

Students are encouraged to take at least one of ST203 and ST205.

ST201 Introduction to Probability Theory three credit points. Prerequisite: Mathematics IA.

Sample spaces, events, probability, random variables, distribution and density functions. Moments, expectations, special distributions, central limit theorem.

ST202 Introduction to Statistics three credit points. Prerequisite: ST201. Application of the results of ST201 to problems of statistical inference; in particular chi-squared, t and F-tests, point and interval estimation, analysis of variance.

ST203 Regression Analysis two credit points. Prerequisite: ST202. The relationship between two or three random variables. The relationship between a random variable and one or more independent variates.

ST204 Non-parametric Methods two credit points. Even numbered years only. Prerequisite: ST202. Order statistics. Sign test, Wilcoxon's test. Non-parametric confidence intervals.

ST205 Design and Analysis of Experiments two credit points. Prerequisite: ST202. The design of experiments and associated analyses of variance.

ST206 Sampling Theory two credit points. Odd numbered years only. Prerequisite: Mathematics IA. Methods of analysis of sample surveys; simple random sampling; cluster sampling; stratified sampling.

ST207 Mathematical Ecology and Genetics two credit points. Prerequisite: Mathematics IA. Application of mathematical models to describe population dynamics and Mendelian inheritance.

ST208 Operations Research two credit points. Prerequisite: ST201. Application of probability models to queues, inventory control and replacement.

THIRD-YEAR SUBJECTS

Pure Mathematics III, Applied Mathematics III, Mathematical Statistics III, Computer Science III

Four mathematics subjects are offered at the third-year level, namely Pure Mathematics III, Applied Mathematics III, Mathematical Statistics III and

Computer Science III. A component system similar to that operating for second-year subjects will apply. Subject to the restrictions listed below, a student taking one mathematics subject must select mathematics components totalling at least 18 credit points and for two subjects at least 36. It may be possible in certain cases for students to select a small number of second-year components instead of third-year components.

Advisers will be available within the mathematics departments at times to be arranged to assist students in making their choice of components.

A student must take at least 12 credit points from the subject in which he is enrolled, and may make up the remainder from any third-year mathematics subject, except that a Computer Science III student may also select from the physics components PH201 (1 credit point), PH302 (1 credit point) and from the physical chemistry component PC308 (1 credit point). Furthermore, ST301 and ST302 are compulsory for Mathematical Statistics III, and CS301, CS302, CS303 and CS304 are compulsory for Computer Science III. Only one of the two components PM312 and PM316 may be counted for credit as a part of third-year mathematics. Students intending to take Mathematical Statistics IV are strongly advised to take PM302.

Students are also reminded that the subject Physical Sciences III is available. Students taking this subject may take some or all of their components from any of those listed below for which they have the required prerequisites.

PREREQUISITES:

These are shown in the following table. In each case the appropriate prerequisite must be passed at a standard determined by the chairman of the appropriate mathematics department. Students will be notified with their examination results if they have not reached this standard.

Subject	Prerequisites
Applied Mathematics III	Applied Mathematics II
Pure Mathematics III	Pure Mathematics II, including PM202.
Mathematical Statistics III	Mathematical Statistics II.
Computer Science III	Normally a second-year mathematics subject, or Physical Sciences II including a significant proportion of mathematics.

In addition, students who intend to take Mathematical Statistics III or Applied Mathematics III are strongly advised to take Pure Mathematics II.

In special circumstances a student with only first-year Mathematics but with some knowledge of computing may be allowed to enrol in Computer Science III.

Note: Each component has its own prerequisite; in special cases prerequisites

may be waived by the chairman of the appropriate mathematics department.

Students intending to take final honours in mathematics must have passed the subject Pure Mathematics II and should consult the various prerequisites for final-honours components before choosing their third-year components.

PRELIMINARY AND PRESCRIBED READING

A list of books for preliminary and prescribed reading will be handed out to all students at the end of 1974. Further prescribed reading in various components may be given during the lectures in these components.

COMPONENTS AVAILABLE

The components for 1975 are listed below. Each department reserves the right to cancel any component in which insufficient interest is shown, or may offer further components. The letters in the code indicate whether the component is pure mathematics (PM), applied mathematics (AM), mathematical statistics (ST), or computer science (CS).

The components in pure mathematics are likely to be offered as follows:

Term 1: PM303, PM305, PM307, PM314

Term 2: PM302, PM304, PM306, PM315

Term 3: PM301, PM308, PM309, PM310, PM313, PM318

PM301 Linear Algebra two credit points.

Topics in linear algebra selected from the following: linear associative and non-associative algebras, including exact sequences, tensor products, structure theorems for simple and semi-simple finite-dimensional algebras; topological vector spaces, including the Hahn-Banach theorem, the closed-graph and open mapping theorems, the Krein-Milman theorem.

PM302 Measure Theory three credit points. Prerequisite: PM305.

General measures on σ -algebras. Measurable functions. Integration and convergence theorems.

PM303 Advanced Calculus A two credit points. Prerequisite: PM202.

A modern approach to differential calculus in higher dimensions: derivative as a linear map, chain rule, higher derivatives and Taylor's theorem, inverse function theorem.

PM304 Advanced Calculus B two credit points. Prerequisite: PM303.

Integration of functions of several variables: Jordan content, integral as a linear map, change of variables theorem.

PM305 Topology two credit points. Prerequisite: PM202.

Metric spaces, limits, continuity, and completeness. Topological spaces. A discussion of general topological properties.

PM306 Group Theory two credit points. Prerequisite: PM206.

Jordan-Hölder theorem. Sylow theorems. Soluble groups and nilpotent groups. Permutation groups. Linear groups.

PM307 Rings and Modules three credit points. Prerequisite: PM206. Principal ideal domains. Elementary theory of modules, leading to finitely generated modules over a principal ideal domain. Application to abelian groups and linear transformations.

PM308 Fourier Series three credit points. Prerequisite: PM302. Convergence of Fourier series. An introduction to some related parts of functional analysis. The Banach-Steinhaus theorem.

PM309 Field Theory two credit points. Prerequisite: PM206. Field extensions, leading to Galois theory. This component may not be offered in 1975.

PM310 Lattice Theory two credit points. Prerequisite: PM305. Posets and lattices. Distributive and modular lattices. Ideal and representation theory. Spaces of prime and minimal prime ideals.

PM312 Formal Logic B six credit points. Prerequisite: PM208, or Philosophy IIFA/IIIFA. This component is identical with Philosophy IIFB/IIIFB. A study of propositional and predicate logic, by considering some formal systems and their semantics, and an introduction to axiomatic set theory.

PM313 Number Theory two credit points. Congruences. Fermat's theorem. Quadratic residues. Representation of integers as sums of squares.

PM314 Function of a Complex Variable two credit points. Prerequisite: PM201. This component is incompatible with AM301. Differentiation and integration of functions of a complex variable. Cauchy's integral theorem. Introduction to contour integration.

PM315 Game Theory two credit points. Prerequisite: PM205. Two person non-zero sum games, n -person games, infinite games.

PM316 Philosophy of Mathematics six credit points. Prerequisite: PM208 or Philosophy IIFA/IIIFA. This component is identical with Philosophy IIPM/IIIPM.

A study of some problems in the foundations of mathematics including a study of the logicist, formalist and intuitionist views, and an examination of some mathematical concepts such as number, set and infinity.

PM318 Linear System Theory two credit points. This course covers elementary topics in linear system theory. The syllabus includes control theory, optimization, and system structure and description with relation to linear systems. Special emphasis will be placed on the control system properties of controllability, observability, stability and realizations.

The prerequisites given for Applied Mathematics III components for 1975 use the terminology of the 1974 handbook. Those given for subsequent years use the terminology of the 1975 handbook.

AM301 Functions of a Complex Variable two credit points. Prerequisite: AM201 or PM201. This component is identical with PM314.

AM302 Calculus of Variations two credit points. Prerequisites: AM201, AM202.

Euler-Lagrange equations. Optimality principles. Applications.

AM303 Integral Transforms two credit points. Prerequisites: AM201, AM202, AM203.

Laplace and Fourier transforms. Applications. Green's functions.

AM304 Hilbert Space and Distributions two credit points. Prerequisites: Either AM201 or PM201, PM202, PM203. All four are desirable.

Linear operators in Hilbert space. Applications to differential equations. Schwartz distributions and generalized functions.

***AM305 Boundary Value Problems** two credit points. Prerequisites: AM201, AM202, AM203.

Sturm-Liouville theory. Comparison and oscillations theorems. Asymptotic expansions.

***AM306 Applied Group Theory** two credit points.

Applications. Symmetries. Representations.

***AM307 Special Functions** two credit points. Prerequisites: AM201, AM202, AM203, AM301.

Topics selected from various special functions including: Orthogonal polynomials. Bessel functions. Applications to partial differential equations. Lie groups.

AM308 Numerical Analysis two credit points. Prerequisites: AM205 and either AM201 or PM203. This component is identical with CS305.

Calculation of eigenvalues and eigenvectors. Perturbation theory. Error analysis. Iterative solution of equations. Solution of boundary value problems.

AM309 Computer Design two credit points. This component is identical with CS302.

AM310 Relativity two credit points. Prerequisites: 1975 – AM204. After 1975 – AM207, AM208.

Lorentz transformation. Minkowski space-time, particle kinematics and ray optics, mechanics of a particle, Maxwell field.

***AM311 Three-dimensional Dynamics** two credit points. Prerequisites: 1975 – AM202, AM204. After 1975 – AM202, AM207, AM208.

Rotating coordinate systems. Rigid body motion. Hamilton's equations.

AM312 Quantum Mechanics A two credit points. Prerequisites: 1975 – AM201, AM202, AM203, AM204. After 1975 – AM201, AM202, AM203, AM204, AM207, AM208.

* to be given only if the demand is sufficient.

Hamiltonian systems. Vector spaces and linear operators, wave functions and wave equations. One-dimensional problems.

AM313 Quantum Mechanics B two credit points. Prerequisites: as for AM312. Atoms and molecules. Angular momentum. Many body problems.

AM314 Potential Theory three credit points. Prerequisites: AM201, AM202, AM203.

Gravitation. Solution of Laplace's equation. Conformal mapping techniques with applications. Electrostatics and magnetostatics.

AM315 Fluid Mechanics two credit points. Prerequisite: AM314. Irrotational fluid mechanics.

***AM316 Electromagnetic Theory** two credit points. Prerequisites: AM314, AM310.

Steady fields and currents. Maxwell's equations. Plane waves. Radiation.

***AM317 Elasticity** two credit points. Prerequisites: AM201, AM202, AM203, PM201, PM202, PM203, AM314.

Stress and strain quadrics. Compatibility conditions. Navier equation in isotropic media. Boundary value problems.

***AM318 Control Theory** two credit points. Prerequisite: Mathematics IA; ST201 is recommended. This component is identical with CS307.

The components in mathematical statistics are normally offered as follows:

Term 1: ST301 and ST307

Term 2: ST302, ST308 (one lecture) and ST304 or ST306

Term 3: ST303, ST308 (two lectures), ST310 and ST305 or ST309.

ST301 Techniques of Mathematical Statistics four credit points. Prerequisite: ST201.

Conditional probability distributions. Transformations in one and many dimensions, derivation and sampling distributions for t and F ; characteristic functions, the central limit theorem and the weak law of large numbers; the multivariate normal distribution, order statistics.

ST302 Inference four credit points. Prerequisites: ST301, ST202.

Estimation, concepts of sufficiency and maximum likelihood, confidence intervals, hypothesis testing, the Neyman-Pearson lemma, asymptotic methods. Bayes' methods.

ST303 Linear Hypothesis Theory four credit points. Prerequisite: ST302.

A general treatment, using the multivariate normal distribution of problems of estimation and hypothesis testing with linear models.

* to be given only if the demand is sufficient.

ST304 Non-parametric Inference A two credit points. Even numbered years only. Prerequisites: ST202, ST301.

Ranks, order statistics; sign test, Wilcoxon test, Kolmogorov-Smirnov test; non-parametric estimation.

ST305 Non-parametric Inference B two credit points. Even numbered years only. Prerequisites: ST304.

Tests of symmetry and independence; Kendall and Spearman rank correlation.

ST306 Sampling Theory two credit points. Odd numbered years only. This component is identical to ST206. Prerequisite: Mathematics IA.

Methods of analysis of sample surveys; simple random sampling; cluster sampling, stratified sampling.

ST307 Stochastic Processes three credit points. Prerequisite: ST201.

Probability models for dependent random variables. Random walks. Markov chains in discrete time. Markov processes in continuous time.

ST308 Operations Research three credit points. Prerequisites: ST202, ST307.

Optimization problems, including linear programming and allocation and sequencing problems, applications of the theory of games; introduction to queueing theory; critical path analysis, inventory and replacement.

ST309 Sequential Analysis two credit points. Odd numbered years only.

Prerequisite: ST302.

Wald's lemma and identity; the sequential probability ratio test and its properties. Other sequential procedures. Sequential estimation and fixed-width confidence intervals.

ST310 Control Theory two credit points. Prerequisite: ST201 is desirable but not essential.

Optimal prediction, interpolation and filtering in linear and non-linear systems. System identification and state estimation. Signal detection. Adaptive control problems.

The components in computer science are likely to be offered as follows:

Term 1: CS301, CS302, CS305

Term 2: CS301, CS303, CS306

Term 3: CS301, CS304, CS307, CS308.

CS301 Practical Programming six credit points.

Prerequisite: A working knowledge of one programming language.

This will involve one 2-hour practical session a week for the whole year, which students will spend either studying languages, coding problems, or running programmes. Students will be expected to become proficient in *Algol* and *Macro*, and to be acquainted with *Fortran*, *Cobol* and a non-numeric language.

CS302 Computer Design two credit points. This component is identical with AM309 Hardware components. Boolean algebra and its applications to the design of circuits. Computer logic and arithmetic. Storage. Characteristics and handling of peripheral devices.

CS303 Programming Languages two credit points.

Assemblers, loaders and compilers. Data structures. Syntax. Compiling techniques.

CS304 Operating System two credit points.

Supervisors and operating systems. Multi-programming and time-sharing. Space allocation and scheduling. Data management and file handling.

CS305 Numerical Analysis two credit points. Prerequisite: AM205.

Calculation of eigenvalues and eigenvectors. Perturbation theory. Error analysis. Iterative solution of equations. Boundary value problems.

CS306 Information Theory two credit points. Prerequisite: ST201.

The concepts of information and entropy. Entropy of certain information sources. Channel capacity, noise, and coding.

CS307 Control Theory two credit points. Prerequisite: ST201 is desirable but not essential. This component is identical with ST310.

Optimal prediction, interpolation and filtering in linear and non-linear systems. System identification and state estimation. Signal detection. Adaptive control problems.

CS308 Applications of Computers two credit points. Only one of the components CS307 and CS308 will be given in 1975.

Real-time computer systems. Algebraic manipulation. Computer graphics. Coding theory. Social implications of computers.

CLASS REQUIREMENTS

Class requirements will be given to the student at the beginning of and during the year. Tutorials or practice classes, as arranged for each component. Regular written exercises in each component.

EXAMINATION REQUIREMENTS

About three 3-hour written papers in each subject: the number may vary according to the components chosen. Shorter papers may be set and tests held throughout the year.

HONOURS COURSES

Pure Mathematics IV, Applied Mathematics IV and Mathematical Statistics IV.

A student wishing to enrol in one of the subjects Pure Mathematics IV, Applied Mathematics IV or Mathematical Statistics IV should apply to the chairman of the appropriate department as soon as the results of his third-year examinations are known. As in earlier years, a component system is available to offer choice. A student's choice is not restricted to the components

in the subject in which he is enrolled; subject to the detailed requirements below he may select one or more components from the other two subjects. Each student may take components totalling at least 30 points.

In addition to his work in these components, each student will be required to write a thesis which will be taken into account in his final assessment. The thesis will be supervised by a staff member in the appropriate mathematics department.

Pure Mathematics IV. The prerequisite is Pure Mathematics III, normally with grade B or better. Each student must take fourth-year components totalling at least 30 points, at least 18 of which must be from pure mathematics. The thesis counts as approximately one-third of the year's work.

Applied Mathematics IV. The subject prerequisite is a pass in Applied Mathematics III with a grade B or better. Each student must take fourth-year components totalling at least 30 points, at least 18 of which must be from applied mathematics. The thesis counts as approximately one quarter of the year's work.

Mathematical Statistics IV. The prerequisite is Mathematical Statistics III, with a grade B or better. Students are also strongly advised to have taken Pure Mathematics III, especially the component PM302. Each student must take fourth-year components totalling at least 30 points, at least 18 of which must be from mathematical statistics. The components from Mathematical Statistics IV must include ST401, ST411 and at least one of ST402 and ST403. The thesis counts as approximately one-third of the year's work.

The components offered in fourth-year are listed below: each department reserves the right to withdraw any component in which insufficient interest is shown, or to offer further components.

In special cases prerequisites may be waived by the chairman of the appropriate department.

PM401 Group Theory six credit points. Prerequisite: PM306.

Selected topics from the theory of groups.

PM402 Differentiable Manifolds six credit points. Prerequisites: PM303, PM305.

Selected topics from differential topology and differential geometry.

PM403 Noncommutative Rings six credit points. Prerequisite: PM307.

Selected topics from the theory of Noncommutative Rings. This component may not be offered in 1975.

PM404 Advanced Topics in Nonlinear Programming six credit points. Prerequisite: PM205.

Quadratic and convex programming. Duality. Integer and fractional programming. Programming in complex space.

PM405 Functional Analysis six credit points. Prerequisite: PM308.

Integral representation theory. Locally convex topological vector spaces and the Hahn-Banach theorem. Duality theory. The Stone-Weierstrass theorem. Banach algebras.

PM406 Topics in Algebraic Topology six credit points. Prerequisites: PM206, PM305.

Homotopy theory. Homotopy of paths. The fundamental group functor. Homotopy of maps. Covering spaces and lifting theorems. Higher homotopy groups and related functors.

PM407 Ordered Permutation Groups six credit points.

Representation theory for lattice-ordered groups, closed prime subgroups, complete distributivity, o-transitivity and o-primitivity of ordered permutation groups. Compatible tight Riesz orders on ordered permutation groups.

PM409 Mathematical Logic six credit points. Prerequisite: PM312 or Philosophy IIFB/IIIFB. This component is identical with the mathematical logic component in Philosophy IV.

Metatheory for classical first-order and second-order quantificational logic. Philosophy of mathematics.

Note: Prerequisites for the following components are numbered in accordance with the 1974 Handbook.

AM401 Mathematical Methods eight credit points. Prerequisite: AM301.

Topics selected from: generalized functions. Asymptotic methods. Integral transforms. Integral equations. Applications of functional analysis. Special functions. Lie groups. Complex variables. Lebesgue integral.

AM402 Continuum Mechanics eight credit points. Prerequisites: AM301, AM302.

Topics selected from: motion of Newtonian fluid. Boundary layer theory. Lubrication theory. Hydrodynamic stability. Compressible flow. Elasticity.

AM403 General Relativity eight credit points. Prerequisites: AM301, AM303.

Tensor analysis, Riemannian geometry, Einstein's theory of gravitation, Schwarzschild's solution, gravitational red-shift, perihelion advance, bending of light ray, cosmological models.

AM404 Analytical Mechanics eight credit points. Prerequisites: AM301, AM304.

Hamiltonian systems, global dynamics, transformation theory, stability and perturbation theory.

AM405 Quantum Mechanics eight credit points. Prerequisites: AM301, AM303, AM305.

Advanced quantum field theory and quantum electrodynamics.

AM406 Maxwell Fields eight credit points. Prerequisites: AM301, AM302, AM303, AM306.

Maxwell's equations; polarization; wave guides; radiation from point charge.

AM408 Numerical Analysis eight credit points. Prerequisites: AM301, AM308.

Projection methods. Iterative methods. Order of convergence. Error analysis.

Application of elementary functional analysis to numerical analysis.

AM409 Statistical Mechanics eight credit points. Prerequisites: AM301, AM305.

Maxwell-Boltzmann statistics, ideal gas, quantum statistics, thermodynamics, specific heats.

ST401 Probability Theory four credit points. Prerequisite: PM302 is very strongly recommended.

Probability theory as part of measure theory. Standard theorems and techniques.

ST402 Inference A four credit points.

Decision theory, estimation theory.

ST403 Inference B four credit points.

Advanced theory of hypothesis testing.

ST404 Non-parametric Inference A two credit points. Even numbered years only. This component is identical with ST304.

ST405 Non-parametric Inference B two credit points. Even numbered years only. This component is identical with ST305.

ST406 Probability and Stochastic Processes four credit points. Prerequisite: ST401.

Martingales. Brownian motion. Diffusion processes.

ST407 Applied Stochastic Processes four credit points. Prerequisite: ST307.

Topics from: Markov processes, branching processes, renewal theory.

ST408 Operations Research four credit points. Prerequisite: ST308.

Advanced topics in inventory, optimization procedures, network and flow theory.

ST409 Sequential Analysis two credit points. Odd numbered years only.

This component is identical with ST309.

ST410 Multivariate Analysis four credit points. Prerequisite: ST303.

Estimation and hypothesis testing with the multivariate normal distribution.

Generalised analysis of variance.

ST411 Foundations of Statistical Inference three credit points.

Study of various schools of thought in statistical inference and their logical foundations.

ST412 Stationary Processes two credit points. Prerequisite: ST401.

Introduction to ergodic theory. Spectral theory of covariance stationary processes. Minimum mean squared error prediction.

MICROBIOLOGY

ST413 Time Series three credit points. Prerequisite: ST412.

Estimation and hypothesis testing for time series.

Preliminary reading, prescribed reading and class and examination requirements in Mathematics IV will be given to the student at the beginning of and during the year.

POSTGRADUATE STUDIES

Qualified candidates will be accepted for the degree of MA, M Sc and Ph D in a number of branches of mathematics. More detailed information can be obtained from the chairman of the appropriate mathematics department. Research interests of members of the departments comprise abstract algebra, including group theory and ring theory, lattice-ordered groups, combinatorial theory, mathematical programming, functional analysis, topology, approximation theory, differential equations, numerical methods, computing, astrophysics, fluid mechanics, hydrodynamic stability, statistical mechanics, quantum mechanics, symmetry algebras, general relativity, electrochemistry, electromagnetism, probability theory and stochastic processes, mathematical ecology, regression analysis, mathematical epidemiology, biological cell kinetics, queueing and storage theory, non-parametric statistics, mathematical genetics and the statistical analysis of stochastic processes.

MICROBIOLOGY

The department of microbiology offers courses leading to a B Sc (pass) degree and to a B Sc (honours) degree in microbiology. Postgraduate training leading to degrees at the M Sc and Ph D level is available to suitably qualified candidates.

The microbiology courses are intended to provide a thorough and balanced training in fundamental aspects of general microbiology and the necessary practical skills required for careers in such fields as research, industry or teaching.

Students intending to study microbiology should have performed well in first-year biology and chemistry courses.

MICROBIOLOGY II

A general course covering the major areas of microbiology which will provide an introduction to the biology of micro-organisms and form a basis for Microbiology III.

Syllabus: Structure and physiology of micro-organisms; ultrastructure of microbial cells. Biology of the major groups of micro-organisms. The viruses. Microbial ecology.

Prerequisites: Biology IA or IB and Chemistry I.

Class Requirements: Three lectures a week for three terms and one three-hour practical period per week for three terms.

Prescribed Texts

One of:

Brock, T.D. *Biology of Microorganisms*, 2nd edn, Prentice-Hall 1974

Levy, J., Campbell, J.J.R. and Blackburn, T.H. *Introductory Microbiology*, Wiley International 1973

Stanier, R.Y., Doudoroff, M. and Adelberg, E.A. *General Microbiology*, 3rd edn, Macmillan 1971

Recommended Reference

Davis, D.B., Dulbeco, R., Ginsberg, H.S., Eisen, H.N. and Wood, W.B. *Principles of Microbiology and Immunology*, Harper and Row 1968

Examination Requirements

Three 3-hour written papers. Throughout the year written tests and various other assignments will be given and performance in practical work will be assessed.

MICROBIOLOGY III

To be offered in 1976.

POSTGRADUATE STUDY

Prospective candidates for the M Sc or Ph D degrees should consult the chairman of the department.

PHILOSOPHY

For details see Vol I of the Handbook containing disciplines offered by the School of Humanities.

PHYSICAL SCIENCES

PHYSICAL SCIENCES IT

This is a one-year terminal course in physical sciences and consists of components from mathematics and physics.

As distinct from Physical Sciences II and III, Physical Sciences IT is not available to students enrolled in the School of Physical Sciences. It is a combination of mathematics and physics.

Prerequisites: Although a knowledge of physics and chemistry to higher

PHYSICAL SCIENCES

school certificate level is desirable, a student who has obtained a good pass at leaving level would be accepted. In such cases the preliminary reading suggested should be carefully studied.

Preliminary Reading

Courant, R. and Robbins, H. *What is Mathematics?* Oxford Univ. Pr.

Selected topics from one or other of the following books:

Messell, H.(Ed.) *Modern Introduction to Physics*, vols I and II, Horowitz and Graham;

Physical Sciences Study Committee *Physics*, Heath and Co.

MATHEMATICS COMPONENT

Differentiation and integration of simple algebraic and trigonometric functions. Taylor series (expansion of algebraic, trigonometric and exponential functions). Partial differentiation. Definition and elementary properties of complex numbers. Graphical representation and the complex exponential functions. Addition and multiplication of vectors. The gradient of scalar functions and also the Laplace equation. Simple differential equations.

PHYSICS COMPONENT 36 lectures plus one term laboratory

PH126 Properties of Matter and Environmental Physics 21 lectures

Elasticity, stress and strain in solids, hydrostatics, surface tension, capillarity; hydrodynamics, Bernoulli's equation, viscosity, Poiseuille's equation, Stokes' law; heat and thermodynamics, radiation from the sun and earth, composition and temperature effects in the atmosphere, energy balance at the earth's surface; thermionic emission, photo-electric effect, radioactivity, effect of radiation on living tissue.

PH127 Electrical Circuit Theory 15 lectures

DC circuits, resistances in series and parallel, Kirchoff's Laws and Thevenin Theorem. AC circuits, sinusoidal voltages and currents. Resistive loads, instantaneous and average power, differential properties of R, L and C, phasor concept; L, LC and LRC circuits; p-n junctions.

Class Requirements: Approximately three lectures a week for three terms. Tutorial classes each week in physics and mathematics and one term of physics laboratory work in electronics.

PHYSICAL SCIENCES II AND III

Physical Sciences II and III are subjects which can be made up of components of any physical science subject, with the provision that the same component cannot be counted as part of two subjects. The work value of the segments must total at least 12 units in the second year and 18 units in third year. The units chosen must be recorded by the adviser of studies in physics, Dr J.G. Jenkin, as well as all subsequent changes.

PHYSICAL SCIENCES II

Segments from second-year subjects which may be included in Physical Sciences II can be chosen from the following, and the total work value must be at least 12 credit points.

CHEMISTRY

Inorganic Chemistry IIB, Organic Chemistry II and Physical Chemistry IIA. Each may be taken singly or in combination provided that chemistry is not taken as a major subject at the second-year level. The prerequisite for each is Chemistry I and each has a work value of four credit points.

GEOLOGY

Crystal optics (three credit points) may be taken by itself *or* crystal optics together with igneous petrology or metamorphic petrology or sedimentology may be taken for six credit points.

MATHEMATICS

A student may take any second-year mathematics component for which he has the prerequisite. Advice on the choice of components may be obtained from the advisers in the mathematics departments.

PHYSICS

Second-year physics components may be chosen in one of the following ways:

- (1) Four credit points from PH201 to PH207, together with two laboratory courses.
- (2) Six credit points from PH201 to PH207, together with three laboratory courses.
- (3) Eight credit points from PH201 to PH207, together with four laboratory courses.

Students must discuss their choice of components in physics with one of the advisers of studies in physics.

PHILOSOPHY

Students may choose from Philosophy IIFA, IISA, IIPM, IIFB, IILA, IIPS. Each counts as six credit points. With the permission of an adviser of studies in the School of Physical Sciences other second-year philosophy subjects may be chosen.

PHYSICAL SCIENCES III

Segments from third-year subjects which may be included in Physical Sciences III can be chosen from the following: and the total work value must be at least 18 credit points.

PHYSICAL SCIENCES

CHEMISTRY

Six segments of Chemistry III may be taken in Physical Sciences III: Inorganic Chemistry IIIA and IIIB, Organic Chemistry IIIA and IIIB, and Physical Chemistry IIIA and IIIB.

Each of the six segments may be taken singly or in combination provided that a IIIB segment is taken before the corresponding IIIA segment or concurrently with it. Each has a value of one third of a third-year unit and Physical Sciences III may be made up entirely of three segments of chemistry. The prerequisite for each course is the appropriate course from Chemistry II.

Students should note that completion of sections of the Chemistry III course in Physical Sciences III does not qualify them for admission to the honours school of chemistry, but that Physical Chemistry III may qualify them for admission to Chemical Physics IV.

GEOLOGY

Geology II is recommended as a prerequisite for any course taken from those listed for Geology III. Field Geology is only available to those students taking a full course so that the following will be available to those students taking Physical Sciences III: isotope geology, three credit points; solution geochemistry and ore deposits, three credit points; igneous petrogenesis, two credit points; thermodynamics and phase equilibria for geologists, three credit points; advanced structural analysis of rocks, one credit point; sedimentary rocks and ore deposits, two credit points.

MATHEMATICS

A student may take any component from Pure Mathematics III, Applied Mathematics III, Mathematical Statistics III or Computer Science III for which he has the prerequisite. Advice on the choice of components may be obtained from advisers in the mathematics departments.

PHYSICS

Third-year physics components may be chosen in one of the following ways:

- (1) Two credit points from PH301 to PH308 and one laboratory credit point (three points).
- (2) Four credit points from PH301 to PH308 and two laboratory credit points (six points).
- (3) Six credit points from PH301 to PH308 and three laboratory credit points (nine points).
- (4) Eight credit points from PH301 to PH308 and four laboratory credit points (twelve points).

Alternatively, students enrolled in Physics IIIA may choose components from Physics IIIB together with mathematics or chemistry components to meet the requirements for Physical Sciences III.

Students must discuss their choice of components in physics with the physics adviser of studies.

PHILOSOPHY

Students may choose from Philosophy IIIFA, IIIFC, IIIFD, IIIFE, IIIF, IIISA, IIIPM, IIIFB, IIILA, IIISA, IIISB. Each counts as six credit points. With the permission of an adviser of studies in the School of Physical Sciences other third-year philosophy subjects may be chosen.

PHYSICS

A student majoring in physics for the B Sc degree takes the sequence: Physics IA, Physics IIA, Physics IIIA. A mathematics subject is required in first and second year to proceed to the next year and Physical Sciences III is recommended as the second subject in third year for those students intending to go on to Physics IV for an honours B Sc degree. (See under Physics IIIA later). Physics IB and Physics IIB are alternative courses to Physics IA and Physics IIA respectively and are intended for non-physics majors.

Physics IIB is a terminal course and students completing it will not normally be permitted to proceed to either Physics IIIA or Physics IIIB without consultation with the chairman of the physics department. Similar consultation is required for transfer from Physics IB into Physics IIA. Certain components of Physics IIIA and IIIB will normally be available to students who have completed Physics IIB for the purposes of forming a Physical Sciences III course. Certain components of Physics IIA and IIB will also be available to students who have completed Physics IB for the purposes of forming a Physical Sciences II course.

Physics IIIB is intended to give a broader view of physics and can only be taken with Physics IIIA.

PHYSICS IA AND IB

Prerequisite: Physics I courses will be conducted on the assumption that students have reached a standard in physics and in mathematics equivalent to that of higher school certificate level.

PHYSICS IA COMPONENTS

PH101 Electrical Circuit Analysis 12 lectures

D.C. Circuits: resistances in series and parallel; circuit theorems (Kirchoff, Thevenin, Norton, maximum power transfer) and circuit analysis; measuring instruments and circuits. A.C. circuits; sinusoidal voltage and current. Resistive load, instantaneous power, average power, properties of R, L and C; transformer, vector representation and complex notation; measuring

bridge and the C.R.O.; LCR circuits and associated properties (frequency response, filters, resonance, transients).

PH102 Wave and Field Propagation 12 lectures

General wave phenomena and their inter-relationships. Superposition of waves (interference, diffraction) and its applications to mechanical sound and electromagnetic waves. Geometrical optics.

PH103 Electricity and Magnetism 20 lectures

This course considers the three basic electrical and magnetic experiments, derives the appropriate laws: Gauss' law, Ampere's law, Faraday's law, and relates these to the integral forms of Maxwell's equations. Topics include: electrostatics, Coulomb's law, electric field, Gauss' law, potential, capacitance, dielectric materials. Magnetism: moving charges, Ampere's law, Biot-Savart law, Faraday's law of induction, inductance, dipoles and susceptibility, Lenz's law and time varying magnetic fields. Maxwell's equations in integral form, simple wave solutions, Poynting vector.

PH104 Modern Physics 8 lectures

Brief historical introduction. De Broglie relationships. Wave particle dualism. Electrons as waves. Electron diffraction, wave packets. Phase and group velocities. Heisenberg's uncertainty principle, the wave equation. Characteristics of X-rays (production, theory).

PH105 Mechanics and Special Relativity 12 lectures

Statics. Dynamics. Energy. Gravitation. Simple harmonic motion. Rotational dynamics. Special relativity theory. Lorentz Fitzgerald contraction. Time dilation. Variation of mass with velocity. Relativistic energy.

PH106 Nuclear Physics 8 lectures

Objectives, hierarchy of forces, nomenclature and units, nuclear radius, nuclear mass and binding energy, stability considerations and decay processes, energy level diagrams.

PH111, PH112, PH113

A three-term introductory course in electronic measurement techniques.

Class Requirements: Lectures — three a week for three terms. Tutorials — one a week for three terms. Laboratory — four hours a week for three terms.

Examination Requirements: Each unit course, as outlined above, will be examined during the year and at the end of the year as appropriate. The laboratory work of each student is assessed continually throughout the year and is taken into account in the final results.

Preliminary Reading

Victorian University and Schools Examination Board, form VI physics texts (PSSC Physics, 3rd edn)

Prescribed Reading

M. Alonso and E.J. Finn *Physics*, Addison-Wesley 1970

PHYSICS IB COMPONENTS

PH121 Electrical Circuits 12 lectures (see PH101)

PH122 Mathematical Introduction 12 lectures

Differentiation, integration, vectors, dot and cross products, complex numbers, differential equations and examples.

PH123 Optics 8 lectures

Nature and propagation of light, Huygen's principle, dispersion, thin lenses, interference, Fresnel diffraction, Fraunhofer diffraction.

PH124 Electricity and Magnetism 10 lectures

This course discusses basic ideas in electricity and magnetism. Electrostatics: Coulomb's law, electric fields, Gauss' law, potential, capacitance and dielectrics: Magnetism: moving charges, ampere's law, induction and inductance.

PH125 Mechanics 10 lectures

Translational and rotational equilibrium (statics). Kinematics. Dynamics of systems of particles and rigid bodies. Rotational dynamics. Frames of reference.

PH126 Properties of Matter and Environmental Physics 21 lectures

Elasticity, stress and strain in solids; hydrostatics, surface tension, capillarity; hydrodynamics, Bernoulli's equation, viscosity, Poiseuille's equation, Stoke's law; heat and thermodynamics, radiation from the sun and earth, composition and temperature effects in the atmosphere, energy balance and the earth's surface, thermionic emission, photoelectric effect of radiation on living tissue.

PH111, PH112, PH113

A three-term laboratory course in electronic measurement techniques.

Class Requirements: Lectures — three a week for three terms. Tutorials — one a week for three terms. Laboratory — four hours a week for three terms.

Examination Requirements: Each unit course, as outlined above, will be examined during the year and at the end of the year as appropriate. The laboratory work of each student is assessed continually throughout the year and is taken into account in the final results.

Preliminary Reading

Victorian Universities and Schools Examination Board, form VI physics texts (PSSC Physics, 3rd edn).

PHYSICS

Prescribed Reading

F.W. Sears and M.W. Zemansky *University Physics*, Addison-Wesley, 4th edn
1970

PHYSICS IIA & IIB

Prerequisites: Physics IA and Mathematics IA or IB are normal prerequisites for Physics IIA. Physics IA or IB and Mathematics IA or IB are prerequisites for Physics IIB. Students who have completed Physics IB and who wish to enrol for Physics IIA must consult with the chairman of the physics department before the end of Physics I in order that vacation reading may be set.

PHYSICS IIA COMPONENTS 12 credit points constitute Physics IIA.

PH201 Physical Electronics one credit point

Conduction in solids; intrinsic and extrinsic semiconductors; p-n junction; diode circuit applications; junction transistor; transistor configurations; transistor biasing, hybrid model; analysis of amplifier circuits; vacuum diode, triode, pentode.

PH202 Physical Optics one credit point

Description, production and analysis of polarized light; Jones matrices. Geometrical optics; thick lenses.

PH203 Classical Mechanics and Relativity two credit points

Generalized co-ordinates, velocities and momenta, Lagrangian function and Lagrange's equation. Conservation laws. Central field; collision problems; system of particles. Conservative systems. Hamiltonian function and Hamilton's equation. Poisson bracket. Rigid-body dynamics; inertia tensor, Minkowski's space-time; geometric representation of space time. Four-vector formulation of special relativity; four-velocity, four momenta, four-force. Transformation of dynamic quantities. Relativity and electromagnetism.

PH204 Thermodynamics two credit points

Classical thermodynamics with applications to low temperature physics.

PH205 Quantum Mechanics two credit points

Magnitudes of physical quantities in quantum mechanics. Uncertainty principle. Fourier transforms. Schrodinger equation. Barrier-well problems. Harmonic oscillator. Average values in quantum mechanics: Legendre, Laguerre Polynomials. One-electron atoms. Angular momenta. Introductory matrix mechanics.

PH206 Solid State Physics one credit point

Crystal structure, crystal diffraction, elastic constants and elastic waves, phonons and lattice vibrations.

PH207 Electromagnetic Theory two credit points

Mathematical preparation, Maxwell's equations in differential form, method

of solution in Laplace's equation, the wave equation and electrodynamic potentials.

PH208 Fluid Dynamics one credit point

Equation of continuity. Particle rates of change and local rates of change. Streamlines. Euler's equation of motion. Bernoulli's equation, three-dimensional potential flow. Circulation. Some potential theorems. Stream function and two-dimensional flow. Viscous flow; the Navier-Stokes equation for viscous incompressible flow. Poiseuille's law. Stoke's formula.

PH211, PH212, PH213, PH214, PH215, PH216: Associated laboratory courses.

Class Requirements: Lectures — four a week for three terms. Laboratory — four hours a week for three terms.

Examination Requirements: Each unit course as outlined above will be examined during the year and at the end of the year. The laboratory work of each student is assessed continually throughout the year and is taken into account in the final result.

Preliminary Reading: See prescribed reading for Physics I.

Prescribed Reading

Reitz, J.R. and Milford, F.J. *Foundations of Electromagnetic Theory*, Addison-Wesley 1960

Leighton, R.B. *Principles of Modern Physics*, McGraw-Hill, Paperback, 1959

Kittel, C. *Introduction to Solid State Physics*, 1st edn, Macmillan
or

Elliott, R.J. and Gibson, A.F. *Introduction to Solid State Physics*, 1st edn, Macmillan

Pippard, A.B. *Classical Thermodynamics*, Cambridge 1966

Millman, R.M. and Halkias, I.Mc. *Integrated Electronics*, McGraw-Hill 1972

Landau, L.D. and Lifshitz, E.M. *Mechanics*, Addison-Wesley 1960

PHYSICS IIB COMPONENTS

PH221 Electronic Devices two credit points

Conduction in solids; intrinsic and extrinsic semiconductors; p-n junction; diode circuit applications; SCR's; junction transistor; transistor configurations, transistor biasing, hybrid model; analysis of amplifier circuits; vacuum diode, triode, pentode; integrated circuits; feedback amplifiers; operational amplifiers; oscillators; analogue computers; electrical and electronic instruments, principles and uses.

PH222 Classical Mechanics one credit point

Generalized coordinates, velocities and momenta. Lagrangian function and Lagrange's equation. Hamiltonian function and Hamilton's equation. Poisson bracket.

PHYSICS

PH223 Elementary Statistical Mechanics one credit point

Boltzmann statistics. Partition function. Applications. Fermi-Dirac and Bose-Einstein statistics. Elementary kinetic theory of gases; transport theory. Single relaxation time Boltzmann equation.

Macroscopic conservation equations.

PH224 Quantum Mechanics and Atomic Spectroscopy three credit points

Magnitudes of physical quantities in quantum mechanics. Fourier series and Fourier transforms. Uncertainty principle. Schroedinger equation. Barrier-well problems. Harmonic oscillator. Average values. One electron atom. Multi-electron atoms. Vector model for angular momentum. Zeeman and Paschen – Back effects. Atomic spectra.

PH225 Materials Science 1.5 credit points

Crystalline and amorphous solids. Lattice vibrations. Energy bands.

Imperfections in crystals. Diffusion in materials. Metals, ceramics, polymers and glasses. Alloys. Phase diagrams, eutectics.

PH226 Electromagnetic Theory and Optics 2.5 credit points

Maxwell's equations, gauge invariance, dielectric and magnetic properties of matter (including plasmas), polarizabilities and susceptibilities, dipolar interactions, interaction of light with matter. Hamiltonian operator in electric and magnetic fields, production and analysis of polarized light, Jones matrices.

PH227 Nuclear Physics one credit point

Objectives, hierarchy of forces, nomenclature and units, nuclear radius, nuclear mass and binding energy, stability considerations and decay processes, energy level diagrams.

PH211, PH212, PH213, PH214, PH215, PH216. Associated laboratory courses.

Class Requirements: Lectures — four a week for three terms. Laboratory — four hours a week for three terms.

Examination Requirements: Each unit course as outlined above will be examined during the year and at the end of the year. The laboratory work of each student is assessed continually throughout the year and is taken into account in the final result.

Preliminary Reading: See prescribed reading for Physics I.

Prescribed Reading

Hudson, M. *Structure and Metals*, Hutchinson Educational Ltd, London 1973

Leighton, R.B. *Principles of Modern Physics*, McGraw-Hill Paperback 1959

Wells, D.A. *Lagrangian Dynamics*, Schaum 1967

Reif, F. *Statistical Physics*, Berkeley Physics Course, vol. 5 McGraw-Hill 1967

Smith, R.J. *Electronics : Circuits and Devices*, Wiley International 1973
 Wert, C.A. and Thomson, R.M. *Physics of Solids*, McGraw-Hill International
 Student Edn, 2nd edn 1964

PHYSICS IIIA

Students who intend going on to the fourth year (honours) in physics are advised to make the following enrolment in their third year — Physics IIIA and Physical Sciences III, provided they have the correct prerequisites. Physics IIIA consists of PH301 to PH307 inclusive, plus the laboratory courses PH351 to PH356 inclusive. Physical Sciences III for intending Physics IV students should include some or all of the following applied mathematics units together with appropriate units selected from Physics IIIB to make a total of 18 credit points. The selection of units for the above Physical Sciences III course should be done in consultation with the adviser of studies in physics, Dr J.G. Jenkin.

The applied mathematics units are: AM301 functions of a complex variable; AM302 calculus of variations; AM303 integral transforms; AM304 Hilbert space and distributions; AM305 boundary value problems; AM307 special functions.

Prerequisites: Physics IIA and Mathematics II; or Physics IIB plus Mathematics II or Physical Sciences II in certain circumstances as determined by consultation with the chairman of the department of physics.

PHYSICS IIIA COMPONENTS 18 credit points constitute Physics IIIA

PH301 Quantum Mechanics two credit points

Operator formalism. Commutator brackets. Angular momentum. Perturbation theory: spin-orbit coupling. Stark effect, Zeeman effect, Indistinguishability: Pauli exclusion principle; exchange degeneracy and the Helium atom. Variational principle.

PH302 Electronics one credit point

FET's and MOSFET'S; feedback amplifiers, properties of negative feedback and stability; sinusoidal oscillators; relaxation oscillators; constant-k and m-derived circuits.

PH303 Electromagnetic Theory two credit points

Maxwell's equations and e.m. waves in vacuo. Retarded and Hertz polarization potentials. Poynting's theorem. Application of Maxwell's equations; transmission lines, wave guides, cavities and aeriels, accelerated charges, scattering and dispersion. Electromagnetism, special relativity and quantum theory.

PH304 Nuclear Physics two credit points

Introduction (forces, terminology and units, angular momentum, cross-

PHYSICS

section Rutherford scattering). Mass and binding energy. Semi-empirical mass formula and nuclear stability. Nuclear decay and parity. I-spin, independent particle model. Single-particle shell model. Configuration mixing and intermediate coupling. Collective model. Single-particle states in a deformed potential.

PH305 Statistical Mechanics two credit points

Quantum statistical mechanics. Statistical description of ensembles of a large number of particles and its application to metals, gases and He^4 .

PH306 Optics one credit point

Reflection from dielectric and metallic surfaces, and thin films. Introduction to laser physics.

PH307 Solid State Physics two credit points

Free electron Fermi gases, energy bands in solids. Semiconductor materials and transport properties of semiconductors.

Laboratory Courses: PH351, PH352, PH353, PH354, PH355 and PH356 — each one credit point.

Class Requirements: Lectures — four a week for three terms. Laboratory — eight hours a week for three terms.

Examination Requirements: Four 3-hour papers. The laboratory work of each student is assessed continually throughout the year and is taken into account in determining the overall performance of the student.

Preliminary Reading: see prescribed reading for second year.

PHYSICS IIIB

This course is a terminal course and may only be taken with Physics IIIA. The course is designed to provide a broader and less theoretical view of the recent achievements and techniques of physics.

In special circumstances students who complete Physics IIIB (as well as Physics IIIA) may be permitted to enrol in Physics IV.

Components of Physics IIIB are available for selection as Physical Sciences III course units.

PHYSICS IIIB COMPONENTS 18 credit points constitute Physics IIIB

PH308 Atomic Physics and Spectroscopy 2 credit points

Vector model of atom, spectral states, perturbation theory. Selection rules. Atoms in a magnetic field. Complex spectra. Introduction to molecular spectra.

PH309 Plasma Physics two credit points

Charged particles in electromagnetic fields treated individually and en masse.

PH310 Experimental Methods four credit points

Specialised electronic techniques – digital circuits, elementary computer logic vacuum systems, vacuum technology.

PH311 Physics of the Earth four credit points

Seismology or wave propagation in the earth, solar and terrestrial relationships

PH312 Low Temperature Physics one credit point

Low temperature phenomena, liquid helium, first and second sound, superconductivity; magnetic resonance.

PH313 Electron Emission from Solids one credit point

Work functions, photoelectron spectroscopy.

PH314 Ionic Solids one credit point

PH315 Materials Science one credit point

Adsorption processes; alloys, phase diagrams, eutectics; glasses, polymers, ceramics; heat treatment of metals and alloys.

PH316 Ionization Physics one credit point

The properties of weakly ionized gases. Interaction of charged particles with surfaces. Electrical breakdown of gases.

Class Requirements: Lectures and reading courses as arranged. Four hours a week for three terms. Laboratory – eight hours a week for three terms.

Laboratory: Laboratory work consists of projects supervised by a member of staff. Six credit points of laboratory are available.

Examination Requirements: Performance in the course will be assessed either by examination or during the year as determined.

PHYSICS IV

Prerequisites: A student enrolling in this subject will be expected at least to have completed the Physics IIIA course or its equivalent. Admission to this course is at the discretion of the chairman of the department of physics.

Physics IV is suitable for both experimental and theoretical students. The course consists of 16 credit points selected from the syllabus listed below and a research project. Choice of course and project must be discussed with the Year IV coordinator, Dr McLaughlin.

PHYSICS IV COMPONENTS

PH401 Mathematical Physics and Statistical Mechanics three credit points

Use of Green's functions in the Many-Body problem. Feynmann diagrams. Quasi-particles. Dyson's equation approximations. Applications to superconductivity, electron gas in metals, superfluids, liquid state.

PH402 Elementary Particles one credit point

Interactions. The particles (graviton, photon, neutrinos, muons, pions, other

PHYSICS

mesons, hyperons, baryon resonances, meson resonances, anti-particles).
Classification.

PH403 Nuclear Physics one credit point

Nuclear reactions. The compound nucleus. Resonant reactions. Optical model. Direct reactions, isobaric analog states.

PH404 Quantum Mechanics three credit points

Relativistic quantum mechanics, Klein-Gordon equation. Dirac equation, field quantisations, Feynman diagrams.

PH405 Solid State Physics two credit points

Diamagnetism. Paramagnetism. Ferro, ferri, and antiferromagnetism. Magnetic resonance.

PH406 Experimental Methods two credit points

PH407 Upper Atmosphere Physics five credit points

Physics of the atmosphere and ionosphere. Electrodynamics of the magnetosphere. Radio waves in the ionosphere.

PH408 Electron Physics five credit points

Solid state phenomena concerned with electron emission from solids; photoelectron spectroscopy, secondary emission. Metal surface studies: adsorption of gases, work function measurements. Gas discharge physics. Surface waves on solids: Rayleigh waves, surface wave transducers. Magnetic resonance studies: ESR, NMR, NQR, PQR

PH409 Atomic Collisions one credit point

PH410 Relativity two credit points

Tensors, Einstein's gravitational equations. Schwarzschild space-time. Three tests of gravitation theory.

PH411 Advanced Statistical Mechanics two credit points

PH412 Symmetry and Particle Physics two credit points

PH413 Plasma Physics one credit point

Motion of charged particles in force fields. Macroscopic motion of plasma in force fields. Waves in a plasma.

PH414 Electrodynamics one credit point

PH415 Ionization Physics one credit point

The properties of weakly ionized gases. Interaction of charged particles with surfaces. Electrical breakdown of gases.

PH416 Magnetohydrodynamics one credit point

Options: Certain units in advanced mathematics courses may be taken in place of some of the units listed above. Any such interchange must be approved by the chairman of the department of physics.

Project: Students are required to choose either an experimental or theoretical research project which shall carry 30 per cent of the total assessment for the year.

Class Requirements: Lectures — eight a week till completed. Project — 16 hours a week for two terms.

Examination Requirements: Up to eight 3-hour papers. However, it is anticipated that a number of lecture courses and project areas will be assessed or examined during the course of the year.

POSTGRADUATE STUDIES

Postgraduate studies and research are conducted in the divisions of physics of which there are at present two. Entry qualifications are a good honours degree in physics, theoretical physics, applied mathematics, physical chemistry, molecular science or any other related subject. Students may proceed to the degree of M Sc or Ph D.

Division of Electron Physics Professor D.E. Davies

Photoelectron spectroscopy in a wide variety of solids and measurements of electron mean-free-path and photoelectron cross-sections. Surface adsorption measurements. Electron coincidence spectroscopy. Solid state phenomena studied by electron — and ion — induced electron emission. Electron spin resonance, nuclear spin resonance and laser interferometry of solid surfaces. Ionization phenomena in gases, in particular the study of the plasma surface interface.

Division of Theoretical and Space Physics Professor K.D.Cole

Theoretical: Theory of the earth's ionosphere and magnetosphere. General relativity. Statistical mechanics, theory of liquids. Molecular quantum mechanics.

Experimental: Studies relating to the properties of the ionosphere and magnetosphere using radio and optical techniques. Auroral physics. Solar terrestrial relations.

The division of theoretical and space physics operates a field station in Kilmore Shire and encourages collaborative projects with outside agencies.

PSYCHOLOGY

AVAILABILITY OF PSYCHOLOGY I

The subject, Psychology I, is available to students enrolled in the Schools of Behavioural Sciences, Biological Sciences, Humanities, Physical Sciences and Social Sciences. Quotas will apply to all of these groups, and entry will be determined largely by academic merit. Based on the experience of past years, entry is likely to be very competitive. Students intending to work as psychologists are advised to enrol in the School of Behavioural Sciences (LBV).

BEHAVIOURAL BIOLOGY IT: See page 72.

PSYCHOLOGY I One unit

Dr Meredith Wallace

Some idea of the content of Psychology I can be gained by reading one of the books set as prescribed or recommended reading. In brief, the topics covered include: introduction to psychology; development; love; fear and anger; heredity; neurobiology; perception, sleep, dreaming, and attention; motivation; learning; memory; intelligence; thought and language; social behaviour; personality and abnormal behaviour.

Psychology I involves two 1-hour lectures each week, intended to introduce the student to the content of psychology and to guide and supplement his reading; and one 3-hour laboratory class each week. The laboratory course, in which half of each student's assessment is made, includes films, demonstrations, laboratory experiments and field studies.

It is intended to illustrate some of the content of the lectures, and to introduce the student to the methods used in psychological research.

In addition, integrated with the laboratory course is a one-hour class on introductory statistics designed to introduce the student to techniques for testing out hypotheses about behaviour. Contrary to popular belief, competence in statistics does not require a deep mathematical background, only a willingness to try, and to seek help when it's needed.

Class Requirements: three 1-hour lectures and one 3-hour laboratory class a week.

Prescribed Reading

Harlow, H.F., McGaugh, J.L. and Thompson, R.F. *Psychology*, Albion 1971
Mussen, P. *et al. Psychology: an Introduction*, Heath 1972

Recommended Reading

Kagan, J., Haith, M.M. and Caldwell, C. (Eds) *Psychology: Adapted Readings*, Harcourt, Brace Jovanovich 1971
Rose, S. *The Conscious Brain*, Weidenfeld and Nicholson 1973
Schmaltz, L.W. *Scientific Psychology and Social Concern*, Harper and Row 1971

PSYCHOLOGY II One Unit**Dr G.D. Cumming**

While Psychology I provides an overview of the techniques and content of psychology as a science, Psychology II and III are intended to treat in depth the major content areas and techniques. Psychology II and III are complementary courses and no student who takes only Psychology I and II can be said to have completed his undergraduate training.

Psychology II consists of four hours of lectures a week, three hours of laboratory work and one hour of tutorials. Students will receive one (one-hour) lecture a week on each of the following areas: motivation, perception, and learning. The remaining hour of lectures will be on the design of experiments and analysis of data. The one hour a week tutorial will be used in conjunction with this series of lectures.

Prerequisite: Psychology I

Prescribed Reading

Bower, J.G.R. *Development in Infancy* Freeman 1974

Champion, R.A. *Learning and Activation*, Wiley 1969

Hays, W. *Statistics for Social Sciences*, 2nd edn, Holt Rinehart and Winston 1973

Korman, A.K. *The Psychology of Motivation*, Prentice Hall 1974

Lindsay, P.H. and Norman, D.A. *Human Information Processing*, Academic Pr. 1972

Grossman, S.P. *Essentials of Physiological Psychology*, Wiley 1973

Recommended Reading

Cofer, C. and Appley, M. *Motivation: Theory and Research*, Wiley, 1964

Day, R.H. *Human Perception*, Wiley 1969

Dewsbury, D.A. and Rethlingshafer, D. *Comparative Psychology: A Modern Survey*, McGraw Hill 1973

Gibson, E.J. *Principles of Perceptual Learning and Development*, Appleton Century Crofts 1969

Haber, R.N. and Hershenson, M. *The Psychology of Visual Perception*, Holt Rinehart and Winston 1973

Held, R. and Richards, W. *Perception: Mechanisms and Models*, Freeman 1972

Hokanson, J.E. *The Physiological Bases of Motivation*, Wiley 1969

Janis, I., Mahl, G., Kagan, J. and Holt, R. *Personality*, Harcourt Brace and World 1969

PSYCHOLOGY III One Unit

Mr R.D. Francis

Psychology III consists of four hours of lectures a week, one on each of the following content areas: social behaviour, abnormal behaviour, individual differences in intelligence and personality, and cognitive processes. These lectures are complemented by four hours a week of laboratory work. In addition there will also be two hours a week of seminars where a number of philosophical and methodological issues in the science of psychology will be discussed, as well as some more complex aspects of data analysis and the design of experiments. Finally, students will be required to carry out an experimental project in an area of research currently engaged in by a staff member, and under the supervision of a staff member. The nature of this project would be open to the choice of students within the range of research options currently available.

The complementary nature of Psychology II and Psychology III is seen in the fact that studies in the content areas of Psychology III presuppose training in the more fundamental areas of psychology covered in Psychology II. The program of training is selected (i) to give students as broad a coverage of training as is commensurate with the requirements of depth (ii) to provide students with the broadest base from which to pursue further training in psychology, and (iii) to provide students with the widest range of options for further career training.

Prerequisite: Psychology II.

Preliminary Reading

van Lawick-Goodall, J. *In the Shadow of Man*, Collins 1971

Prescribed Reading

Lindsay, P.H. and Norman, D.A. *Human Information Processing*, Academic Pr. 1972

Maher, B. *Principles of Psychopathology*, McGraw Hill 1970

Posner, M.I. *Cognition. An Introduction*, Scott Foresman 1973

Secord, P.F. and Backman, C.W. *Social Psychology*, 2nd edn, McGraw Hill 1974

Slobin, D.I. *Psycholinguistics*, Scott Foresman 1971

Recommended Reading

Anderson, J. Durston, B. and Poole, M. *Thesis and Assignment Writing*, Wiley 1970

Brown, R. *Social Psychology*, Free Pr. 1965

Bryant, P. *Perception and Understanding in Young Children*, Methuen 1974

Coltheart, M. (Ed.) *Readings in Cognitive Psychology*, Holt, Rinehart and Winston 1972

- Chomsky, N. *Language and Mind*, Harcourt, Brace Jovanovich 1972
- Crano, W. and Brewer, M. *Principles of Research in Social Psychology*, McGraw Hill 1973
- Danziger, K. *Socialization*, Penguin 1971
- Dewsbury, D.A. and Rethlingshafer, D. *Comparative Psychology: A Modern Survey*, McGraw Hill 1973
- Hinde, R.A. *Biological Bases of Human Social Behaviour*, McGraw Hill 1974
- Kintsch, W. *Learning, Memory and Cognitive Processes*, Wiley 1970
- McGaugh, J.L. and Herz, W.J. *Memory Consolidation*, Albion 1972

PSYCHOLOGY IV Honours

Dr Beryl E. McKenzie

This course is available for selected candidates who have already qualified for a pass bachelors degree with a major sequence in psychology. All enrolments in Psychology IV require approval by the chairman of the department and normally students will be expected to have attained distinction in Psychology III.

The course consists of the following:

- (1) An empirical research project carried out independently by the candidates. The proposed hypotheses, design and analysis of the project must be presented at a seminar. This seminar, the literature survey relating to the area of research, and the thesis constitute the major requirement of the fourth-year program.
- (2) Two essays, at least one of which should be on a topic of theoretical importance in psychology. The topics of these essays will be decided in consultation with the supervisor.
- (3) Participation in colloquia and seminars, which will normally be held each week and will include staff and visiting speakers. One of these seminars will cover advanced problems in design and analysis of experiments. Assessment is based on the thesis, seminar papers and essays.

ZOOLOGY

ZOOLOGY II

A course of 45 lectures, with associated practicals and excursions, in which animals will be studied at the population level, with emphasis on the environmental and evolutionary aspects of population biology. Subjects of study will include: the physical environment; population growth; the regulation of population size; interactions between populations; the evolution of populations; population physiology; social behaviour and patterns of

ZOOLOGY

population dispersion; processes of dispersal and colonisation; the distribution of animals.

A course of 20 lectures and associated practicals on aspects of the evolution of vertebrates and the comparative structure and function of the digestive, respiratory, circulatory, urinogenital, nervous system and sense organs of fish, amphibia, reptiles, birds and mammals.

A course of 10 lectures and associated practicals on the origin and evolution of insects.

Prerequisites: Biology IB and preferably either Mathematics IA or Mathematics IC.

Class Requirements: Three lectures and two 3-hour practical/tutorial classes a week for three terms.

Prescribed Reading

Mayr, Ernst, *Population, Species and Evolution* (paperback), Harvard Univ. Pr.

Wallace, R.L. *The Ecology and Evolution of Animal Behaviour*, Goodyear Publishing Co.

Stokes, A.W. *Animal Behaviour in Laboratory and Field*, Freeman (Separates of Nos. 803, 804, 808, 815, 817, 826, 838).

Solomon, M.E. *Population Dynamics* (paperback), Edward Arnold

Ross, H. *A Textbook of Entomology* (soft cover), Wiley-Toppan

Romer, A.S. *The Vertebrate Body*, 4th edn, Saunders

Saunders, J.T., Manton, S.M. and M.E. Brown, *A Manual of Practical Vertebrate Morphology*, Clarendon Pr. Oxford

Clapham, W.B. Jr *Natural Ecosystems* (soft cover), MacMillan

Cherrett, J.M. *et al. Control of Injurious Animals*, Unibooks

Recommended Reading

Andrewartha, H.G. *Introduction to the Study of Animal Populations*, 2nd edn, (soft cover), Methuen

Krebs, C.J. *Ecology*, Harper and Row

Romoser, W.A. *The Science of Entomology*, MacMillan

Johnsgard, P.A. *Animal Behaviour*, W.C. Brown

Marshall, A.J. and Williams, W.D. (Eds) *Textbook of Zoology: Invertebrates* vol. 1, and *vertebrates* vol. 2, MacMillan

Scientific American *The Biosphere*, Freeman

Scientific American *Continents Adrift*, Freeman

De Lattin, G. *Animal Distribution*, Sidgwick and Jackson (if available)

Varley, Gradwell and Hassell, *Insect Population Ecology*, Blackwells

Background Reading

Poole, R.W. *Quantitative Ecology*, McGraw-Hill

- Sokal, R.R. and Rohlf, F.J. *Introduction to Biometrics*, Freeman
- Southwood, T.R.E. *Ecological Methods*, Methuen
- Etkin, W. *Social Behaviour and Organisation among Vertebrates*, Univ. of Chicago Pr.
- Wynne-Edwards, V.C. *Animal Dispersion in Relation to Social Behaviour*, Oliver and Boyd
- Andrewartha, H.G. and Birch, L.C. *The Distribution and Abundance of Animals*, Univ. of Chicago Pr.
- Odum, E.P. *Fundamentals of Ecology* 2nd edn, Saunders
- Macfadyen, A. *Animal Ecology: Aims and Methods*, Pitman
- Kormondy, E.J. *Concepts of Ecology*, Prentice-Hall
- C.S.I.R.O. *Insects of Australia*, Melbourne Univ. Pr.
- Oldroyd, H. *Collection, Preservation and Studying Insects* (paper back), Hutchinson
- Imms, A.D. *A General Textbook of Entomology*, Methuen
- Chapman, A.F. *The Insects: Structure and Function*. English Universities Pr.
- Hardin, G. *Science, Conflict and Society*, Freeman
- Hardin, G. *Population, Evolution, Birth Control*, A collage of controversial readings. (Plus supplement — Hardin, G., Science Controversy — a case study). Freeman
- Weatherley, A.H. *Australian Inland Waters and their Fauna* ANU Pr.
- Forrester, J.W. *World Dynamics*, Wright-Allen

ZOOLOGY III

A course of 72 lectures and associated practicals on aspects of animal physiology. Subjects of study will include: histology and histo-physiology; reproductive physiology; embryology and developmental processes; cellular physiology and membrane biology; sensory physiology, neurophysiology and neural integration; endocrinology; ecological physiology.

A course of 12 lectures and associated practicals on classical ethology: the causation, development and evolution of animal behaviour.

A course of 16 lectures and associated practicals on applied aspects of zoology, including the control of insects of medical and economic importance, fisheries biology, game management and wildlife conservation.

Prerequisite: Zoology II.

Class Requirements: Four lectures and three 3-hour practical/tutorial classes a week for three terms.

Prescribed Reading

- Manning, A. *An Introduction to Animal Behaviour*, Arnold
- Stokes, A. *Animal Behaviour in Laboratory and Field*, Freeman (Separates of Nos. 798, 800, 811, 823, 829, 830, 832, 835, 837, 838)

ZOOLOGY

- Levin, R.J. *The Living Barrier: a Primer on Transfer across Biological Membranes*, Heinemann
- Wood, D.W. *Principles of Animal Physiology*, Arnold
- Case, J. *Sensory Mechanisms*, MacMillan
- Goldsby, R.A. *Cells and Energy*, MacMillan
- Sadler, R.F.M.S. *The Reproduction of Vertebrates*, Academic Pr.
- Balinsky, B.J. *An Introduction to Embryology*, Saunders
- Frye, B.E. *Hormonal Control in Vertebrates*, MacMillan
- Florey, E. *An Introduction to General and Comparative Animal Physiology*, Saunders
- Lockwood, A.P.M. *Animal Body Fluids and their Regulation*, Heinemann
- Recommended Reading**
- Haggis, G.H. *The Electron Microscope in Molecular Biology*, Longmans
- Guthe, K.F. *The Physiology of Cells*, MacMillan
- Lenhoff, E.S. *Tools of Biology*, MacMillan
- Ramsay, J.A. *Physiological Approach to the Lower Animals*, Cambridge Univ. Pr.
- Chapman, R.F. *The Insects: Structure and Function*, English Universities Pr.
- Highnam, K.C. and Hill, L. *The Comparative Endocrinology of the Invertebrates*, Edward Arnold
- Kikkawa and Thorne *The Behaviour of Animals*, Jacaranda
- Klopfer and Hailman *An Introduction to Behaviour: Ethology's First Century*, Prentice-Hall
- Clarke, K.U. *The Biology of the Arthropoda*, Edward Arnold
- Ganong, W.F. *Review of Medical Physiology* (latest edition), Lange Medical Pubs., Maruzen Co.
- Turner, C.D. *General Endocrinology*, Saunders
- Schmidt-Nielsen *How Animals Work*, Cambridge Univ. Pr.
- Oxford Biology Readers Oxford Univ. Pr. No. 14. *Control of Water Balance by the Kidney* No. 16. *The Nucleolus* No. 19. *Mitochondria* No. 25. *Cell Differentiation*
- Mill, P.J. *Respiration in Invertebrates* (soft cover), MacMillan
- Jennings, J.B. *Feeding, Digestion and Assimilation in Animals*, 2nd edn (soft cover), MacMillan
- Vernberg, F.J. and W.B. *The Animal and the Environment*, Holt, Rinehart and Winston

Background Reading

- Marler and Hamilton *Mechanisms of Animal Behaviour*, Wiley
- Hinde, R.A. *Animal Behaviour*, 2nd edn, McGraw Hill
- Eibl-Eibesfeldt, I. *Ethology: the Biology of Behaviour*, Holt, Rinehart and Winston
- Gray, Sir J. *Animal Locomotion*, Weidenfeld and Nicolson

HONOURS COURSE

Honours students are required to undertake a special research project, complete prescribed courses of reading, prepare essays on selected topics, and attend and give seminars. There are no formal lectures, and hours of study are unlimited. Students who do not have qualifications in statistics may be required to complete a statistics course during their honours year.

POSTGRADUATE STUDIES: M Sc and Ph D

Research is currently in progress in the following fields: speciation on oceanic archipelagos; zoogeography of Pacific insects; zoogeography, conservation, physiological ecology and evolution of S.E. Australian reptiles; ecology, taxonomy and morphology of insects; structure of insect communities; population ecology of plant-feeding insects, particularly agricultural pest species; insect dispersal; biological, chemical and integrated control of insect pests; insect acoustics; physiological and ultrastructural studies of mechanisms of salt and water regulation in insects, and of insect sensory receptors; neurosecretory systems in arthropods; methods of analytical electron microscopy and electron probe X-ray microanalysis; physiological ecology of invertebrates; behaviour of Australian birds; reproductive biology of dasyurid marsupials; population ecology of marsupials; ecological physiology of mammals; endocrine control of salt and water metabolism in vertebrates.

Prospective students should contact the chairman of the department for further details.

PART VIII TABLE OF SUBJECTS

SCHOOL OF AGRICULTURE

SUBJECT	CODE NO.
First Year	
Agriculture I	630.10
Biology IA	570.11
Chemistry I	540.10
Physical Sciences IT	500.10
Second Year	
Agriculture IIA	630.20
Agriculture IIB	630.21
Agriculture IIC	630.22
Chemistry IIB	540.21
Biology II	
Botany IIB	580.21
Genetics IIB	570.21
Third Year	
Agriculture IIIA	630.30
Agriculture IIIB	630.31
Agriculture IIIC	630.32
Fourth Year	
Agriculture IVA	630.40
Agriculture IVB	630.41
Agriculture IVC	630.42

SCHOOLS OF BEHAVIOURAL, BIOLOGICAL AND PHYSICAL SCIENCES

SUBJECT	CODE	UNIT VALUE	PREREQUISITE SUBJECTS
Behavioural Biology IT	571.10	1	Confined to students taking Psychology I
Biochemistry II	570.24	1	Chemistry I and Biology IA or Biology IB
Biochemistry III	574.30	1	Biochemistry II
Biochemistry IV	574.40	1	Biochemistry III
Biology IA (botany and genetics)	570.10	1	For students enrolled in the School of Biological Sciences – chemistry and one of biology, physics or a branch of mathematics at HSC level. For students enrolled in other Schools – chemistry at HSC level.
Biology IB (zoology and genetics)	570.11	1	
Botany II	580.20	1	Biology IA and one of Chemistry I, Physics I or a first-year mathematics subject.
Botany III	580.30	1	Botany II
Botany IV	580.40	1	Botany III or special approval of the Board of Studies.
Chemical Physics III	535.30	2	Applied Mathematics II, Chemistry IIA (Physical) and Physics II.
Chemical Physics IV	535.40	—	Chemical Physics III or an approved equivalent.
Chemistry I	540.10	1	Nil
Chemistry IIA	540.20	1	Chemistry I, Physics I or first-year mathematics unit (incompatible with Chemistry IIB).
Chemistry IIB	540.21	1	Chemistry I (incompatible subject Chemistry IIA).
Chemistry IIIA	540.30	1	Chemistry IIA (prior or concurrent study of Chemistry IIIB)
Chemistry IIIB	540.31	1	Chemistry IIA ¹
Chemistry IV	540.40	—	Chemistry IIA and Chemistry IIIB ²
Economics I	330.10	1	Nil
Economics IIMA (macroeconomic Theory)	330.20	0.5	Economics I
Economics IIIM (Microeconomics)	331.23	0.5	Economics I
Econometrics IIES (Economic Statistics)	330.21	0.5	Social Sciences IC or first-year mathematics subject (incompatible subject Mathematical Statistics II)

TABLE OF SUBJECTS

SUBJECT	CODE	UNIT VALUE	PREREQUISITE SUBJECTS
Economic History IIEH (Economic History)	330.22	0.5	Economics I
Accounting IIAC (Accounting)	330.23	0.5	Economics I (Economics IIMA and Economics IIMI and Economics IIES or Econometrics IIME)
Economics II IR (Industrial Relations)	330.24	0.5	Economics I
Econometrics IIME (mathematical Economics)	330.26	0.5	Either a first year mathematics subject or Social Sciences IC or a good pass in Social Sciences IB.
Econometrics II IM (Introductory Mathematics for Economists)	330.27	0.5	Economics I (incompatible with any mathematics subject)
Economics IIBD (Business Decision Making)	330.28	0.5	Economics I
Economics IIIA (Monetary Economics and Economics Policy)	331.36	1	Economics IIMA and Economics IIMI (incompatible with Economics IIIMIH, Economics IIIMAH).
Econometrics III EK (Econometrics)	330.36	0.5	Econometrics IIES or Econometrics IIME
Economics IIIES (Economic Statistics)	330.31	0.5	Econometrics II IM
Economics IVQP (Quantitative Economic Planning)	331.44	0.5	Econometrics III EK or Econometrics IIIOR or Econometrics IIME or Social Sciences IIID
Genetics II	570.20	1	Biology IA and Biology IB and at least one physical sciences subject.
Genetics III	570.30	1	Genetics II
Genetics IV	570.40	1	Genetics III
Geology I	550.10	1	Nil
Geology II	550.20	1	Geology I
Geology III	550.30	1	Geology II
Geology IV	550.40	—	Geology III

TABLE OF SUBJECTS

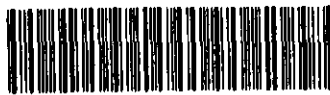
SUBJECT	CODE	UNIT VALUE	PREREQUISITE SUBJECTS
Mathematics IA	512.10	1	Nil (incompatible with Mathematics IC)
Mathematics IB	512.11	1	Nil (incompatible with Mathematics IC)
Mathematics IC	512.12	1	Nil (incompatible with Mathematics IA and Mathematics IB)
Applied Mathematics II	515.20	1	Mathematics IA
Mathematical Statistics II	519.20	1	Mathematics IA
Pure Mathematics II	510.20	1	Mathematics IA
Applied Mathematics III	515.30	1	Applied Mathematics II
Mathematical Statistics III	519.30	1	Mathematical Statistics II, Pure Mathematics II ³
Pure Mathematics III	510.30	1	Pure Mathematics II
Computer Science III	520.30	1	Normally a second-year mathematics subject or Physical Sciences II including a significant proportion of mathematics.
Applied Mathematics IV	515.40	—	Applied Mathematics III and Pure Mathematics II
Mathematical Statistics IV	519.40	—	Mathematical Statistics III and Pure Mathematics II
Pure Mathematics IV	510.40	—	Pure Mathematics III
Philosophy IA (human nature, rationality and morality)	100.10	1	Nil
Philosophy IB (positive philosophy)	100.11	1	Nil
Philosophy C (problems of philosophy)	100.12	1	Nil
Philosophy ID (contemporary analytical philosophy)	100.13	1	Nil
Philosophy IIFA/IIIFA (formal logic A)	100.20/ 100.30	0.5	Any first-year philosophy unit or any two units from the Schools of Biological or Physical Sciences
Philosophy IISA/IIISA (philosophy of science A)	100.21/ 100.31	0.5	Any first-year philosophy unit or any two units from the Schools of Biological or Physical Sciences
Philosophy IIFB/IIIFB (formal logic B)	103.21/ 103.31	0.5	Philosophy IIFA/IIIFA
Philosophy IIPM/IIIPM (philosophy of mathematics)	104.24/ 104.34	0.5	Philosophy IIFA/IIIFA and either a first-year mathematics unit, or Philosophy IIFB/IIIFB. Concurrent enrolment in the latter course is sufficient.

TABLE OF SUBJECTS

SUBJECT	CODE	UNIT VALUE	PREREQUISITE SUBJECTS
Philosophy IIPS/IIIPS (philosophy of psychology)	101.20/ 101.30	0.5	Philosophy I or any subjects from the Schools of Social or Behavioural or Biological Sciences having a total work value of at least two units.
Philosophy IILA/IIILA (philosophical logic A)	103.22/ 103.32	0.5	Philosophy IIFA/IIIFA
Philosophy IIISB (philosophy of science B)	100.39	0.5	Philosophy IISA/IIISA
Philosophy IIIFC (metallogic)	103.33	0.5	Philosophy IIFA/IIIFA
Philosophy IIIFD (recursion and proof theory)	104.33	0.5	Philosophy IIFB/IIIFB or Philosophy IIIFC
Philosophy IIIFE (set theory)	102.35	0.5	Philosophy IIFA/IIIFA
Philosophy IIIF (Lesniewskian logic)	102.36	0.5	Philosophy IIFA/IIIFA
Physical Sciences IT	500.10	1	Nil
Physical Sciences II	500.20	1	As for each segment
Physical Sciences III	500.30	1	As for each segment
Physics I	530.10	1	Nil
Physics II	530.20	1	Physics I, first-year mathematics subject
Physics IIIA	530.30	1	Physics II, second-year mathematics subject
Physics IIIB	530.31	1	Physics II, second-year mathematics subject
Physics IV	530.40	—	Physics IIIA
Psychology I	150.10	1	
Psychology II	150.21	1	Psychology I and an approved Biology I unit.
Psychology III	150.31	1	Psychology II
Psychology IV	150.40	—	A pass in a bachelors degree with a major sequence in psychology.
Zoology II	590.20	1	Biology IB, and either Mathematics IA or Mathematics IC
Zoology III	590.30	1	Zoology II
Zoology IV	590.40	1	Zoology III.

* The unit value is 0.5 if presented as part of a second-year unit and is 0.33 if presented as part of a third-year unit.

1. In special circumstances, the Board of Studies may accept Chemistry IIB as a prerequisite for Chemistry IIIB.
2. Students who have performed well in Chemistry IIIB and another third year science subject may be admitted to the course. Anyone proposing to follow this sequence should consult with a Chemistry Adviser of Studies.
3. Only for students intending to proceed to honours.



C3 2934 01134 3037

32934011343037
Bundoora Reference
378.9451 L364c
1975 v.2
La Trobe University.
Handbook.

NOT FOR LOAN