

La Trobe University
Handbook 1972 Pt 2

Schools of Agriculture, Biological Sciences, Physical Sciences, Department of Psychology



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La Trobe University Handbook 1972

SCHOOLS OF AGRICULTURE,
BIOLOGICAL SCIENCES,
PHYSICAL SCIENCES
DEPARTMENT OF PSYCHOLOGY

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PART I: INTRODUCTION

THE VISITOR

His Excellency the Governor of Victoria, Maj.-Gen. Sir Rohan Delacombe,
KCMG, KCVO, KBE, CB, DSO, K ST J

MEMBERS OF COUNCIL

(as at October 1971)

Sir Archibald Glenn, OBE *Chancellor*
Dr D. M. Myers *Vice-Chancellor*
K. A. Aickin, Esq., QC
Sir John Buchan, CMG
B. J. Callinan, Esq., CBE, DSO, MC
Professor C. J. Eliezer
The Hon. J. W. Galbally, QC, MLC
Professor R. J. Goldman
J. L. Greig, Esq.
The Hon. W. V. Houghton
Dr J. G. Jenkin
Mrs Whitney King, CBE
Dr P. G. Law, CBE
The Rev. Dr J. D. McCaughey
Professor J. D. Morrison
J. D. Norgard, Esq.
W. G. Philip, Esq.
Dr L. W. Shears
Dr W. A. Sinclair
C. D. Starrs, Esq.
Miss J. P. Sullivan
P. N. Thwaites, Esq.
Professor R. D. Topsom
C. C. Trumble, Esq.
K. H. Vial, Esq. CBE (*Deputy Chancellor*)
Professor D. H. Whitehead
M. S. Whiting, Esq., MLA
Professor H. A. Wolfsohn

OFFICERS OF THE UNIVERSITY

Vice-Chancellor D. M. Myers, B SC, D SC ENG, FIEE, FIE AUST, F INST P
Registrar Maj.-Gen. T. S. Taylor, CBE, MVO, MC
Business Manager F. Barnes, B EC, DIP ED (SYD)
Chief Librarian D. H. Borchardt, MA (NZ), DIP NZ LIB SCH, ALA (UK), FLAA

TERM DATES — 1972

FIRST TERM

(10 weeks)

6 March

13 May

SECOND TERM

(9 weeks)

5 June

5 August

THIRD TERM

(7 weeks)

28 August

14 October

Examinations begin 30 October.

Note

1. The one-year Diploma in Education course commences on 28 February and Education II and Education III (concurrent courses) commence on 1 March.

2. Some departments may require students to attend the University for out-of-term activities.

ENQUIRIES

All enquiries should be directed to:

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

Telephone enquiries: 478 3122

Admission enquiries: Student Administration, 478 3122

STAFF

(as at November 1971)

Academic Staff

SCHOOL OF AGRICULTURE

Dean

Professor R. L. Reid

Professor

Reid, R. L. B SC AGR (SYD), PH D (CANTAB), FRSE
Chairman

Senior Lecturers

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)

Lecturers

Cranwell, P. D. B AGR SC, M AGR SC (MASSEY)
Dumsday, R. G. B AGR SC (MELB)
Luke, R. K. J. B AGR SC (MELB), PH D (ANU)
Uren, N. C. B AGR SC, PH D (MELB)
Willatt, S. T. B SC (WA), M SC (NSW)

Demonstrator

Lane, D. W. A. B AGR SC (TAS)

BEHAVIOURAL SCIENCES

PSYCHOLOGY

<i>Professor</i>	Singer, G. MA, PH D (SYD), FAPSA
<i>Lecturer</i>	Montgomery, R. B. BA (SYD)

SCHOOL OF BIOLOGICAL SCIENCES

<i>Dean</i>	Professor A. B. Wardrop
-------------	-------------------------

BIOCHEMISTRY

<i>Professor</i>	Stone, B. A. B SC (MELB), PH D (LOND) <i>Chairman</i>
<i>Lecturer</i>	Holmes, R. S. B SC, PH D (QLD)

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) Griffiths, D. A. B SC, PH D (WALES), FLS Griffiths, D. J. B SC, PH D (WALES)
<i>Lecturers</i>	Staff, I. A. M SC, DIP ED (SYD), PH D (S ILL) Pallaghy, C. K. B SC (MELB), PH D (TAS) Parsons, R. F. B SC (ADEL), PH D (MELB)
<i>Hon. Research Fellow</i>	Lee, Helen M SC (MELB)
<i>Senior Demonstrator</i>	Wong Hee, K. B SC (LA TROBE)

GENETICS AND HUMAN VARIATION

<i>Professor</i>	Parsons, P. A. B AGR SC (ADEL), M SC (MELB), PH D (CANTAB) <i>Chairman</i>
<i>Senior Lecturer</i>	Cooper, D. W. B SC, PH D (ADEL)
<i>Lecturers</i>	Graves, Jennifer M. M SC (ADEL), PH D (CALIF) Hynes, M. J. B AGR SC (ADEL), PH D (FLIN) MacBean, I. T. B SC (MELB), PH D (LA TROBE) MacPhee, D. G. B SC, PH D (EDIN) Murray, N. D. B SC, PH D (SYD) Westerman, M. B SC, PH D (BIRM)
<i>Research Fellow</i> (AINSE)	Westerman, Jane B SC (ADEL), PH D (BIRM)
<i>Senior Demonstrator</i>	Rose, Astrid B SC, DIP ED (MELB)
<i>Demonstrator</i>	McKenzie, J. A. B SC (LA TROBE)

ZOOLOGY

<i>Professor</i>	Thornton, I. W. B. B SC, PH D (LEEDS) <i>Chairman</i>
<i>Senior Lecturers</i>	Danthanarayana, W. B. B SC (CEYLON), PH D (LOND), DIC Marshall, A. T. B SC (LEEDS), PH D (HK), DIC

<i>Lecturers</i>	Woolley, Patricia A. B SC (WA), PH D (ANU) Wright, A. B. B SC, PH D (LIVER) New, T. R. B SC, PH D (LOND), ARCS, DIC Rawlinson, P. A. B SC (MELB)
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SCHOOL OF EDUCATION

<i>Dean</i>	Professor R. J. Goldman
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CENTRE FOR THE STUDY OF COMPARATIVE AND INTERNATIONAL STUDIES IN EDUCATION

<i>Reader</i>	Lovegrove, M. N. BA (NZ), MA, PH D (AUCK), ABPSS
<i>Lecturers</i>	Bessant, B. BA, M ED (MELB), PH D (MON) Brown, A. J. BA, B ED (MON), TPTC Price, R. F. B SC, PH D (LOND), MI BIOL Sheehan, B. A. B COMM, B ED (MELB), MA (LOND) <i>Chairman</i>

CENTRE FOR THE STUDY OF EDUCATIONAL COMMUNICATION AND MEDIA

<i>Visiting Professor</i>	Toeplitz, J. LL D (WARSAW)
<i>Senior Lecturer</i>	Edgar, Patricia M. BA, B ED (MELB), MA (STAN) <i>Chairman</i>
<i>Lecturer</i>	Jones, D. B. BA (KANSAS), MA (STANFORD)
<i>Tutor</i>	Nicholls, R. A. BA (MANC)

CENTRE FOR THE STUDY OF INNOVATION IN EDUCATION

<i>Professor</i>	Evans, G. T. B SC, B ED, PH D (QLD) <i>Chairman</i>
<i>Reader</i>	Turner, M. L. B SC, B ED (MELB), MA, ED D (CALIF)
<i>Lecturers</i>	Szorenyi-Reischl, N. A. BA (ADEL), MA (MELB) White, D. C. B SC, B ED (MELB), TPTC
<i>Senior Tutors</i>	Mathews, Rivkah BA, B ED (MELB)

CENTRE FOR THE STUDY OF TEACHING

<i>Senior Lecturer</i>	Lett, W. R. BA, B ED (MELB), PH D (CALIF) <i>Chairman</i>
<i>Lecturers</i>	Duckers, A. B SC (LOND) Miller, A. B SOC SC (BIRM), DIP ED (EXETER), M ED (MANC) Oates, S. BA, B ED (MELB.), TPTC Rado, Marta J. PH D (PAZMANY PETER, BUDAPEST), DIP ED (MELB) Wesson, Gwenneth L. BA, DIP ED (MELB)
<i>Senior Tutor</i>	Neville, W. B. MA (ADEL)

CENTRE FOR THE STUDY OF URBAN EDUCATION

Professor	Goldman, R. J. BA (MANC), MA (CHIC), MA, PH D (BIRM), FBPS <i>Chairman</i>
Senior Lecturer	Toomey, D. M. BA (MANC), MA (KENT)
Lecturers	Claydon, L. F. DIP ED, MA (BRIST), MA (LOND) Poole, Millicent E. BA, B ED (QLD), MA (UNE)
Senior Tutor	Hampel, B. K. BA, DIP ED (MELB)

SCHOOL OF HUMANITIES

Dean	Professor H. J. McCloskey
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ENGLISH

Professors	de Chickera, E. B. BA (LOND), B LITT (OXON) <i>Chairman</i> Marsh, D. R. C. BA, PH D (NATAL)
Reader	Barnes, R. J. MA (MELB), MA (CANTAB)
Senior Lecturers	French, A. L. MA, M LITT (CANTAB) 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)
Visiting Fellow Lecturers	Shapira, M. MA (CANTAB), AM (HARVARD) Blake, Ann MA, B LITT (OXON) Burns, G. J. MA (MELB) Clancy, L. J. BA (MELB) Ellis, D. G. MA, PH D (CANTAB) <i>on leave</i> *Frost, A. J. MA (QLD), AM PH D (ROCH) Frost, Lucile BA (WILSON COLLEGE), AM PH D (ROCH) Gardiner, N. B. BA (HCNY), MA (ARIZ), PH D (LOND) <i>on leave</i> Hancock, Susan M. MA (CANTUA), MA (OXON) Henry, G. B. M. BA (MELB), MA (SYD) <i>on leave</i> Jones, D. G. H. MA (CANTAB) Richards, M. E. A. MA (AUCK) Rodriguez, Judith C. BA (QLD), MA (CANTAB) Stanyon, C. BA (KEELE) <i>on leave</i> Watson, C. J. BA (MELB) Wightman, Jennifer A. MA (ADEL)
Senior Tutor	Collits, T. J. MA (SYD), DIP ED (NEWCASTLE)
Tutors	Cullum, G. G. BA (SYD), MA (LA TROBE) Robieson, Carolyn A. BA (MELB)

* Joint appointment with the Department of History

HISTORY

Professors	Getzler, I. MA (MELB), PH D (LOND) Martin, A. W. MA, DIP ED (SYD), PH D (ANU) Salmond, J. A. MA (OTAGO), PH D (DUKE) <i>Chairman</i>
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<i>Visiting Fellow</i>	Martin, Rev. Prof. F. X. MA (DUBLIN), PH D (CANTAB)
<i>Reader</i>	Gregory, J. S. MA (MELB), PH D (LOND)
<i>Senior Lecturers</i>	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) Isaac, R. L. BA (CAPETOWN), MA (OXON) Johanson, D. F. C. BA (MELB), BA (OXON) Mulligan, Lotte MA (MELB), PH D (ADEL) Philipp, June M. MA, PH D (MELB) Tyrrell, A. A. MA (EDIN), MA (MCMASTER) Ward, A. D. MA (NZ), PH D (ANU)
<i>Lecturers</i>	Ahmad, Z. BA (CALCUTTA), BA (LOND), B LITT (OXON) Barta, A. A. MA (OTAGO) Cashmere, J. J. BA (NSW), DIP ED (SYD) MA (TAS) Clendinnen, Inga V. BA (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) Dunning, T. P. BA, MA (CALIF) *Frost, A. J. MA (QLD), PH D (ROCH) Hammerton, A. J. BA (SIR G WMS) PH D (BR COL) Hirst, J. B. BA PH D (ADEL) Huish, D. J. BA (CANTAB) PH D (ANU) Jeffcott, C. A. BA (NZ), BA (OXON) PH D (ANU) Johnson, R. A. BA (MELB) Martell, W. H. T. BA, DIP ED (MELB) Murray, W. J. BA (ADEL) Phillips, W. W. BA (ADEL), PH D (ANU) Potts, D. J. E. BA (MELB) Richards, Judith MA (AUCK) Shultz, R. J. BA (IOWA), MA (OMAHA)
<i>Tutors</i>	Adams, R. W. BA (LA TROBE) Clarke, Kamoya BA, DIP ED (MELB) Watts, R. W. BA (LA TROBE)

* Joint appointment with the Department of English.

MODERN LANGUAGES

French

<i>Professor</i>	Forsyth, E. C. BA, DIP ED (ADEL), DU (PARIS) <i>Chairman, Department of Modern Languages</i>
<i>Senior Lecturer</i>	Paradissis, A. G. BA (LOND), MA, PH D (MELB), L EN D (SHANGHAI)

<i>Lecturers</i>	Hooke, R. L. G. BA (MELB), MA (ESSEX) Masterman, Lindis E. BA (MELB), DES (PARIS) Schutte, Marie-France L ES L, M ES L (PARIS)
Spanish	
<i>Professor</i>	Thompson, R. W. MA (DUB) <i>on leave</i>
<i>Lecturers</i>	Bell, A. MA (ST AND) 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.

PHILOSOPHY

<i>Professors</i>	Ellis, B. D. B SC, BA (ADEL), B PHIL (OXON) <i>on leave</i> McCloskey, H. J. MA, PH D (MELB)
<i>Reader</i>	Weiler, G. MA (JERUSALEM & DUB), B PHIL (OXON) <i>Chairman</i>
<i>Senior Lecturers</i>	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) Richards, T. J. MA (WELL), D PHIL (OXON), FRAS
<i>Lecturers</i>	Brady, R. T. B SC (SYD), MA (NE), PH D (ST AND) Cann, M. R. BA, B MUS, AUA (ADEL) Fox, J. F. BA (MELB) Hyslop, A. MA (ADEL) Jackson, F. C. B SC, BA (MELB) Mackie, Alwynne MA, PH D (MELB), TSTC Pargetter, R. J. B SC, MA (MELB), DIP ED (MON) Von Thun, M. BA (SYD)
<i>Senior Tutors</i>	Fox, R. A. LL B, MA (MELB) Lucas, G. J. BA (POMONA, CALIF), MA (NEW MEXICO)

SCHOOL OF PHYSICAL SCIENCES

<i>Dean</i>	Professor C. J. Eliezer
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CHEMISTRY

Inorganic and Analytical Chemistry

<i>Professor</i>	Magee, R. J. M SC (QUB), PH D, D SC (EDIN), FICI, FRIC, FRSH, FRACI
<i>Senior Lecturers</i>	Cattrall, R. W. B SC, PH D (ADEL), ARACI O'Connor, M. J. B SC (ADEL), PH D (MON), ARACI
<i>Lecturers</i>	Cardwell, T. J. B SC, PH D (QUB), ARIC Wedd, A. G. B SC, PH D (TAS)
<i>Research Fellow</i>	Hill, J. O. B SC (LOND), PH D (SURREY)

Senior Demonstrators Krankovits, Emilia M. B SC (BUDAPEST), M SC (LA TROBE)
Tutor Tariq, S. A. M SC (PANJAB), PH D (SOTON), ARACI
 Slater, S. J. E. B SC (NSW)

Organic Chemistry

Professor Topsom, R. D. M SC (NZ), PH D (LOND), FRIC, FRACI, FNZIC
Senior Lecturers Davis, M. BA, PH D, (CANTAB), ARACI, AMIREE
 Deady, L. W. M SC, PH D (CANTUA), ANZIC
 Ternai, B. B SC, DIP CHEM ENG (BUDAPEST), M SC (MELB), PH D (E ANGLIA), ARACI
Lecturer Reiss, J. A. B SC, PH D (ADEL), ARACI
Research Associates Brownlee, R. T. C. BA (CANTAB), M SC, PH D (E ANGLIA)
 Broxton, T. J. B SC, PH D (WA)
Senior Demonstrator Davy, J. R. B SC (NSW), PH D (FLIN)

Physical Chemistry

Professor Morrison, J. D. PH D, D SC (GLAS), FRACI, FAA
Senior Lecturers Arthur, N. L. B SC, PH D (ADEL)
 Dale, D. H. B SC (RHODES), D PHIL (OXON)
Lecturers 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
Research Associate Smith, J. F. ARMIT

GEOLOGY

Professor White, A. J. R. B SC (ADEL), PH D (LOND)

MATHEMATICS

Professors Eliezer, C. J. MA, PH D (CANTAB), M SC, D SC (LOND),
 BAR-AT-LAW (MIDDLE TEMPLE), FIMA
 Ewens, W. J. MA (MELB), PH D (ANU)
 Mond, B. BA (YU), MA (BU), PH D (UC) *Chairman*
Senior Lecturers Andrew, A. L. M SC (NZ), M SC (ANU)
 Cohen, H. A. B SC (SYD), PH D (ANU)
 Johnston, R. B SC, PH D (GLAS)
 Jones, A. R. MA, PH D (MELB)
 Pearson, K. R. BA, PH D (ADEL)
 Ross, D. K. MA (MELB), PH D (MANC)
 Roy, S. K. M SC, PH D (PATNA), FIMA
 Woodhouse, D. MA, D PHIL (OXON), M SC (E AF),
 MLMS

<i>Lecturers</i>	Becker, N. G. B SC, M SC (MELB) Davis, G. E. B SC (MON) Elton, G. C. M SC (NZ), PH D (ANU) Scott, D. J. BA (ANU) Strantzen, J. B. B SC (MELB) Taylor, D. E. M SC (MON), D PHIL (OXON)
<i>Tutor</i>	Gray, A. R. BA (MON)

PHYSICS

Electron Physics

<i>Professor</i>	Davies, D. Elwyn B SC, PH D (WALES), F INST P, FAIP
<i>Senior Lecturers</i>	Jenkin, J. G. B SC (ADEL), PH D (ANU), AAIP Leckey, R. C. G. B SC, PH D (QUB), A INST P Lee, A. R. B SC (HK), PH D (LOND), A INST P Liesegang, J. B SC (QLD), D PHIL (OXON), AAIP
<i>Lecturers</i>	Miller, R. B. B SC, PH D (NE) Riley, J. D. B SC, B ENG (SYD), PH D (OXON)
<i>Research Fellow</i>	Fleming, I. A. B ENG, PH D (LIV)

Space Physics

<i>Professor</i>	Cole, K. D. M SC DIP ED, D SC (QLD), FAIP
<i>Senior Lecturers</i>	Butcher, E. C. B SC, PH D (EXON) McLaughlin, I. L. B SC, PH D (ADEL)
<i>Lecturers</i>	Dyson, P. L. B SC, PH D (MELB) Essex, Elizabeth A. B SC, PH D (NE) Kalotas, T. M. BE, M SC (NSW), D PHIL (SUS)

SCHOOL OF SOCIAL SCIENCES

<i>Dean</i>	Professor H. A. Wolfsohn
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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>Readers</i>	Sinclair, W. A. M COMM (MELB), D PHIL (OXON) Webb, L. R. B COMM (MELB), PH D (LOND)
<i>Senior Lecturers</i>	Anderson, J. L. BA (NE) Burley, H. T. B EC (ADEL), MA, PH D (CANTAB) Schneider, M. BA (ADEL), M SC (CANTAB) Stent, W. R. B AGR SC (MELB), DTA (TRIN), DIP AGR EC (OXON) Stewardson, B. R. MA (MELB), PH D (CANTAB) Thomas, K. D. BA (ADEL), M EC (CALIF)

<i>Lecturer</i>	Cooper, P. I. BA (KEELE), MA (LEIC)
<i>Visiting Lecturers</i>	Elsum, D. L. B ENG, B COMM (MELB), M SC, PH D (GEORGIA INST TECH)
	Subocz, V. M COMM (MELB), PH D (LOND), AASA
<i>Research Fellow</i>	Weston, Caryl R. B COMM (MELB)
<i>Instructors</i>	Jemison, Helen M. B COMM, DIP ED (MELB)
	Wiltshire, Zaiga M EC (SYD)
<i>Senior Tutors</i>	Defris, Lorraine B COMM (MELB)
	Parmenter, B. R. BA (NOTT), MA (LEIC)
<i>Tutors</i>	Harris, G. T. B COMM, DIP ED (MELB)
	Richardson, Susan B COMM (MELB)

LEGAL STUDIES

<i>Professor</i>	Braybrooke, E. K. LL M (NZ), LL M (COLUMBIA)
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POLITICS

<i>Professors</i>	Martin, R. M. MA (NZ), PH D (ANU) <i>Chairman</i> Wolfsohn, H. A. BA (MELB)
<i>Senior Lecturers</i>	Beaglehole, J. H. MA (OXON), B SC EC, PH D (LOND)
	Rydon, C. Joan BA, DIP ED (SYD), PH D (MELB)
<i>Senior Research Fellow</i>	Kawaguchi, H. BA (SEIKEI), MA, PH D (TOKYO)
<i>Lecturers</i>	Glezer, L. BA (MELB)
	Good, K. A. MA (QLD), PH D (MCGILL)
	Plehwe, R. BA LLB (TAS), PH D (DUKE)
	Polis, T. BA (MELB)
	Rubenstein, C. L. MA (MELB)
	Schehtman, J. BA (JERUSALEM), PH D (UNC)
	Smith, R. F. I. MA (ADEL), PH D (ANU)
<i>Senior Tutors</i>	Doyle, D. A. BA (MELB)
	Georgiou, P. BA (MELB)
	McCoppin, G. Brigid BA (MELB)

SOCIOLOGY

<i>Professor</i>	Martin, Jean I. MA (SYD), PH D (ANU) <i>Chairman</i>
<i>Reader</i>	Edgar, D. E. BA, M ED (MELB), PH D (STAN)
<i>Senior Lecturers</i>	Balmer, C. J. BA (TAS), ED D (FLOR)
	Cubbon, H. A. MA (CANTAB), PH D (MELB)
	Ireland, R. H. BA (MELB), PH D (HARV)
	Mulligan, D. G. MA (NZ), PH D (LOND)
	Rose, G. MA (OXON), MA (CANTAB)
	Trahair, R. C. S. BA, PH D (MELB)

Lecturers

Fitzgerald, J. M. LL B (MELB), LL M MA (ILL)
Hickman, D. C. BA, B ED (MELB) PH D (ANU)
Inglis, Christine BA (SYD), MA (ANU)
Lauderdale, Sandra BA (COLOR), MA (CORN)
Otto, Rosemarie BA, DIP SOC STUD (MELB)
Richards, Marilyn G. BA (ADEL)
Richmond, Catherine M. G. BA (MELB), MA (ANU)
Schutte, H. DIPL HDL (COLOGNE), DR SC POL (KIEL)

Senior Library Staff

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

Readers' Services

Assoc. Librarian Scrivener, J. E. BA, DIP ED (TAS), ALA (UK), ALAA
Reference Librarian Choate, C. R. BA (WYOM), MS IN LS (COLUMB)

Selection

Librarian Barraclough, H. C. BA (MELB), MA (CALIF), ALAA

Serials

Librarian Longley, Pamela R. BA (TAS), ALAA

Systems

Librarian

Technical Services

Assoc. Librarian Stecher, G. BA (MELB), BLS (MCGILL), ALAA
Librarians Hoffman, Helen K. BA (MELB), ALAA
Horacek, J. I. BA (MELB), ALAA
McKinlay, J. W. BA (TAS), ALAA

Senior Administrative and College Staff

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

Registrar Taylor, Maj-Gen. T. S. CBE, MVO, MC
Deputy Registrar Griffith, D. A. C. TD, B SC (ENG) (LOND), AFAIM
Assistant Registrar Kennard, D. N. BA (NE), AAIM
Staff Officer Tolhurst, N. M.

Council Executive Officer Sewell, S. M. BD (LOND), MA (HARTFORD)

Publications and Information Officer Segrave, R. W. MAIE, AMICIE, MPRIA
Business Manager Barnes, F. B EC, DIP ED (SYD)
Chief Accountant Henley, J. W. FASA, FCIS

Assistant Chief Accountant Gruer, E. F. FASA
Buildings Officer Russell, T. C. C. ARIBA, ARAIA

CHISHOLM COLLEGE

Head

GLENN COLLEGE

President

Oates, S. BA, B ED (MELB)

Secretary

Bodey, N. H.

MENZIES COLLEGE

Chairman

Manager

Star, J. C.

COMPUTER CENTRE

Manager

Edwards, J. A. BA (KEELE)

UNIVERSITY ADVISORY SERVICES

Health Service

Physician-in-Charge

Semmens, K. MB, BS (MELB), DTMH (LOND)

Counselling Service

Counsellor

Bailey, C. F. B ECON (SYD), DIP PSYCH (MELB)

Careers and Appointments Service

Adviser

Waterhouse, J. L. B COMM (MELB)

ESTABLISHMENT OF THE UNIVERSITY

La Trobe University is named after Charles Joseph La Trobe, who between 1839 and 1854 served the young Victorian community with distinction. As the Third University Committee explained in its report to the Minister for Education: 'La Trobe was not a university man (which was not uncommon in his day) but he appears to have had almost every quality one would desire in one. He had a lively interest in every aspect of life of the community, the will to work for the good of other men and a sense of responsibility towards posterity. He came to the infant town of Melbourne in 1839 as a Superintendent and became the first Lieutenant-Governor when Port Phillip District was separated from New South Wales in 1850. He granted the sites for the State Library and Melbourne University, took the chair at the meeting which inaugurated Royal Melbourne Hospital, and was the prime mover for the establishment of the Botanical Gardens.' The origins of La Trobe University date from a recommendation in the second report of the Australian Universities Commission that a third university be established in the metropolitan area of Melbourne. As a result of this recommendation the Victorian Government established in 1964 a 'Third University Committee', which held its first meeting on 2 June 1964.

As a site for the new University the committee recommended the farm attached to the Mont Park Mental Hospital at Bundoora. This area of approximately 500 acres situated within nine miles of the centre of Melbourne met the Committee's requirements as far as size and location were concerned. It seemed ideal for landscaping and for subsequent architectural development, services were readily available nearby and no costly problems were apparent.

In considering the academic organization of the future University the committee took particular note of the division into large faculties traditional at most Australian universities and concluded that this was not an ideal pattern to be followed in an institution which, from the outset, was being planned to reach an enrolment of approximately 10,000 in little more than a decade. The committee accordingly recommended that the academic structure of the University should be based on smaller units to be known as Schools, each of which would be responsible for the conduct of teaching and research in its own area. In the committee's view each such School, while naturally including disciplines involving a high degree of specialization, should still be of such a nature as to permit its academic leaders to form a reasonable understanding and maintain control of its activities.

The general proposals put forward in the report of the Third University Committee were incorporated where appropriate in the La Trobe University Act No. 7189 of 1964 which received Royal assent on 9 December that year. The Act set up an Interim Council which held its first meeting on 23 December 1964. That meeting established what are known now as the Academic Board and the building, finance, legis-

lation, and college and housing committees. The recommendation of the Committee that there should be an Academic Board smaller in size than the traditional professorial board is also embodied in the Act. The duties of the Academic Board are similar to those undertaken by a professorial board and include particularly the consideration of academic matters that concern the whole University.

Responsibility for the planning of the University remained with the Interim Council until 19 December 1966 when the first Council took office and held its inaugural meeting. At that meeting Sir Archibald Glenn, who had been chairman of the Interim Council since its inception, was elected as Chancellor of the University, a position which he still holds. At the same meeting Mr B. J. Callinan was elected as Deputy Chancellor, a position which he retained for the maximum period of three years permitted under the Statutes. He was succeeded in 1970 by Mr K. H. Vial. The Chancellor was installed on 8 March 1967 by the Visitor to the University, His Excellency Major-General Sir Rohan Delacombe, Governor of Victoria, at an outdoor ceremony during which the Premier of Victoria (Sir Henry Bolte) formally opened the University.

Dr D. M. Myers was appointed in March 1965 as the first Vice-Chancellor of the University. At that time he was Dean of the Faculty of Applied Science at the University of British Columbia in Vancouver, Canada, and formerly Professor of Electrical Engineering at the University of Sydney and Chief of the Division of Electrotechnology, CSIRO.

A master plan prepared by Mr Roy Simpson of Yuncken Freeman Architects was adopted by the Interim Council in mid-1965 as the basis for the physical development of the University. Since that time Mr Simpson has continued to fulfil the role of master planner.

The University opened in 1967 with an enrolment of 500 in the initial Schools of Biological Sciences, Humanities, Physical Sciences and Social Sciences. The School of Agriculture accepted its first students in 1968. The University's enrolment for bachelor degree courses rose from 2154 in 1970 to 2551 in 1971. In the same period higher degree enrolments rose from 184 in 1970 to 203 in 1971. Other enrolments in 1971 accounted for 265 students.

Enrolments in the School of Education, which commenced in 1970 with 129 Diploma in Education students, increased considerably in 1971 when there were 192 diploma students, 52 bachelor students and 7 higher degree students.

The student population is expected to increase substantially in 1972 to a total in excess of 3,800. This growth is in keeping with plans to accommodate approximately 10,000 bachelor degree enrolments by 1980.

There were 840 members of staff at the University in 1971, and by 1980 this is expected to increase to more than 2,000.

DEVELOPMENT

The University's physical development follows the master plan's central principles, flexibly interpreted in the light of experience. These principles include concentration of the academic buildings in a core around

the library, multi-level pedestrian circulation in this central area, the placing of colleges in an outer ring flanked by landscaped car parks, and the use of areas on the further perimeter for specialized academic reserves and future research institutes. Kingsbury Drive divides the University site: sportsfields lie on one side and the academic campus on the other. The whole is enhanced by a system of stepped lakes and an extensive tree and shrub planting program.

Beginning modestly in 1965, the University's building program has resulted in a present completed floor space of 900,000 square feet. There are nine lecture theatres. Glenn College and the first stage of the library had to accommodate the initial intake of students in 1967. Since then facilities have been added to provide permanent homes for five Schools (humanities, social sciences, biological sciences, physical sciences and agriculture), and administration. The area of the library was more than doubled to 100,000 square feet in 1970, and the same year saw the completion of the maintenance and services depot and stage I of the animal and glass-house complex. The other important building projects brought to fruition have been Menzies and Chisholm college residences, the eastern lecture theatre, the agora stage I, the PABX, the sports pavilion and sports union field house complex. Altogether 35 per cent of the estimated ultimate volume of building is now complete. Projects to be finished during 1972 include a 500-seat theatre for lectures and drama, residential extensions to Glenn and Menzies colleges, the western arm of the agora and a general union building.

LIBRARY

The collections and services of the library are being developed to support the teaching and research programs of the University. At this early stage in its growth emphasis has been placed on the provision of books and periodicals directly relating to the subjects being taught. In 1972 the holdings will be approximately 150,000 volumes of books and periodicals and some 30,000 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 240,000 volumes and 1,800 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, and offices and workrooms for the library staff. Level three houses the general collection and the main reading area, including 32 lockable carrells 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, the special collections room and the microfilm collection and reading area.

A fuller description of the library and of the services it offers to students is contained in the *Introductory Guide to the Library*. The rules

governing use of the library are set out in the University's Regulation 20.2(1) *Use of the Library*. All students should provide themselves with the Guide and the regulations, copies of which may be had from 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.

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 University opened in 1967, and Menzies College, which opened the following year, also provide dining, social and recreational facilities for both residents and non-residents. The construction of the residential buildings of Chisholm College is expected to be completed in time for resident students to be admitted at the beginning of the 1972 academic year.

Application for College Residence

In addition to the application to enrol at the University, a separate application is required for residential accommodation in 1972 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.

if possible before 30 November. Information about the 1972 residence fees will be available at the time of application.

UNIVERSITY HEALTH SERVICE

Physician-in-charge: Dr K. Semmens

Physician: Dr H. Beveridge

Nursing Sister: Miss Nina Sedlmayr

Secretary/Receptionist: Miss Jennifer Kerr

In 1972 the University Health Service will be located in the new building for the University Advisory Services (running south from the humanities building).

For staff, it provides treatment in medical emergency, vaccinations before overseas travel, superannuation medical examinations, and the opportunity to discuss medical problems which are causing concern.

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. Treatment will be provided where possible, or the patient may be referred to the most appropriate place for further care. Prevention being better than cure, not only are prophylactic injections such as tetanus,

polio, smallpox etc. obtainable, but, on many topics, information and advice which might help to avoid trouble are available.

Consultation: on weekdays, during normal University hours, preferably by appointment, but in an emergency, just call in.

UNIVERSITY COUNSELLING SERVICE

University Counsellor: Mr C. F. Bailey

Secretary: Mrs Cheryl Kennon

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 the business of effective study, adjusting to life at university, or dealing with their personal problems.

The service is available with (but in an emergency without) an appointment to any member of the University and to those who are interested in becoming students. Appointments can be made in person or by telephoning the University on extension 2958. During 1972 the Counselling unit will be located with the other advisory services between the humanities building and the south building.

CAREERS AND APPOINTMENTS

Adviser: Mr John Waterhouse

Assistant to Adviser: Miss Pauline Cross

Secretary: Miss Merrin Browne

The Careers and Appointments Service helps an undergraduate to clarify and achieve his vocational goals. The service offers advice and information to enable the student to be realistically aware of the facts and problems of career opportunities, thus equipping him to accept responsibility for his own future. It assists those seeking graduate employment, and may be of help to students who are looking for vacation work, or part-time work during the academic year, or positions in which they can make the best use of a partially completed degree course. Advice about careers open to graduates may also be of use to those who are involved in choosing between possible university courses or still completing their final year at school.

STUDENT HOUSING SERVICE

Student Housing Officer: Mrs Betty Collings

Secretary: Mrs Mavis Wood

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 \$8 a week) to private board (from \$14 a week)

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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 mostly two-bedroom, furnished flats, letting at \$24-\$26 a week on a 40-week lease. 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.

Non-Collegiate Accommodation

The University endeavours to assist all students living away from home to find suitable accommodation either in a college or elsewhere. Details of the Student Housing Service are given above. Any prospective student who is likely to require accommodation other than in one of the colleges should write to the Student Accommodation Office at the address set out above, if possible not later than 30 November, for further information and application forms.

CHAPLAINS

The chaplains' rooms are located in the east lecture theatre block. Details of the times when the chaplains are available are posted on notice boards around the University. The chaplains are Rev. Fr V. Harkins and Rev. Dr I. R. M. Parsons. The counsellor to Jewish students is Mr H. Shaw.

COMPUTER CENTRE

Manager: Mr J. Edwards

Secretary: Miss Y. Burnham

The University Computer Centre is equipped with a small PDP-9 computer and a PDP-15 computer. The PDP-9 is designed to service, on line, various research experiments and to provide an interpretive single-user console system. The PDP-15 provides facilities for student batch and research processing. It has 16,000 words of memory, disc storage of one half million words, two DECTape units, two industry compatible magnetic tape units, card reader and line printer. The centre is located on the ground floor of the chemistry building (next to the library).

Service courses both in programming and in operating are provided by the centre for academic departments. Additional courses are open to students and staff. Information about these courses will be posted on the official notice board.

STUDENT LOANS

The resources of the Students' Loan Fund are limited. The Students' Loan Fund Committee expects that, in 1972, it will be able to assist only

those students whose financial difficulties are considerable and who require loans to enable them to pay fees, purchase books and equipment and provide accommodation and food. It is the committee's policy that a loan should supplement other income and not serve as a student's primary source of funds.

During 1971 the committee adopted a policy under which it would advance no more than \$550 to a student during one academic year with a maximum of not more than \$1100 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 account of 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. Shorter periods apply to other types of loan (emergency, short term, medium term). The amount of interest charged on a student loan varies according to the repayment period set. An applicant is normally required to nominate a guarantor for the loan.

The committee may recommend to the Bank of New South Wales that it grant a supplementary loan of up to \$200 on the basis of \$2 for \$1 from the fund. Interest is charged on the bank loan at a concessional rate.

A list of persons who may approve short term (up to \$50, repaid within two months) and emergency (up to \$10, repaid within two weeks) loans is displayed on the official noticeboard.

Enquiries regarding all types of student loans should be directed to the secretary of the Students' Loan Fund Committee, Registrar's Department.

THE LA TROBE UNIVERSITY BOOKSHOP

The La Trobe University bookshop is owned by the University. The shop, located on the eastern side of the agora, is the largest in the northern suburbs and one of the best in Melbourne.

The bookshop stocks all text books prescribed or recommended for study in the many courses offered at La Trobe, as well as a liberal range of general reading involving an extensive range of fiction and of reference works. There is a choice of children's books and a special and up-to-date section for current and topical releases. A variety of stationery, pens, records and magazines is also available.

The bookshop has a carefully controlled credit system for those who wish to pay for their purchases on a monthly basis. A special order service and a reservation service are also offered. The former enables a customer to order types of books not normally held in stock; the latter allows customers to reserve books that are already on order. When they arrive a copy is put aside and the customer notified that the books can be collected.

At present the bookshop is subsidized in order to maintain its current level of stock and range of services. This subsidy comes from the bookshop levy which is a component of the general service fee. Students pay the levy only once. In 1971 all students paid the levy of \$4 but in

1972 only students entering the University for the first time will be required to pay the fee. Members of the University staff are requested to donate \$4 to the bookshop. When the bookshop makes a profit, it is proposed that this will be distributed for the benefit of members of the University.

The bookshop is controlled by a board of management representing various interests within the University. The board comprises five students appointed by the Students' Representative Council, and one representative of the academic staff, the Business Manager's Department and the Library. The bookshop manager is a member of the board, and there is a professional outside consultant. At present, the chairman of the board is a student.

Any enquiries about the bookshop should, in the first instance, be directed to the manager.

CHILD CARE CENTRE

The La Trobe University child care centre opened towards the end of the 1971 academic year. A management committee, consisting of students and staff and one outside expert is elected in April of each year.

The building incorporates two play rooms (for different age groups) and various other facilities. The centre, which caters for 25 children aged from six weeks to five years, is available to children of students or staff of the University.

All enquiries should be made to the directoress of the centre.

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 elected from each club. The Sports Union executive committee is directly responsible for the day-to-day administration of Sports Union affairs.

Sports Union policy is to encourage participation in a wide range of sporting activities by members of the University community by providing for the development of both recreational and competitive sporting activities. Considerable subsidies are provided to enable members easy access to all sporting activities. Staff are encouraged to join the Sports Union. All participants are covered by comprehensive insurance during sporting activity.

The first capital grant from the Australian Universities Commission provided for the establishment of the sports pavilion and the development of the permanent playing fields to their present stage. The first stage of the indoor sports centre is now completed and is located north-east of Glenn College. It comprises an indoor field house 80 feet by 100 feet for all indoor activities, two squash courts, a comprehensive amenities block (including storage and meeting facilities) and a temporary sports

union office. The centre is open on week days from 9 am until midnight and on Sundays from 2 pm to 10 pm.

The development of further permanent sports areas and facilities is taking place in the south-western section of the site in addition to the 13 acres already established.

Although a relatively small student population exists at La Trobe, a wide variety of sporting clubs is functioning. The following clubs are available to members this year: aikido, athletics, Australian rules football, badminton, baseball, basketball (men's international rules), basketball (women's international rules), boxing, canoeing, cricket, equestrian, fencing, golf, hockey (men's), hockey (women's), judo, karate, lacrosse, lawn tennis, mountaineering, netball, rifle, rowing rugby, skiing, skin-diving, sky-diving, softball, squash racquets, surf-riding, table tennis, volleyball, weightlifting and yachting. Clubs enter teams in intervarsity, intra-varsity and local competitions.

Any enquiries regarding these clubs and their activities should be directed to the Sports Union office located at the indoor sports centre.

STUDENTS' REPRESENTATIVE COUNCIL

The SRC, which is elected by and from all students (full-time, part-time, postgraduate and undergraduate) exists to 'represent the students of the University on all matters affecting their interests . . .' The SRC meets with the University Council and other bodies to provide information and advice on matters concerning students and where necessary to negotiate improvements.

The SRC employs an administrative secretary and two secretaries who, with the staff of the student newspaper *Rabelais*, occupy offices in the agora. As time proceeds more permanent quarters will be provided together with adequate facilities for extra-collegiate and extra-curricular activities.

La Trobe University is a constituent of the Australian Union of Students. The union provides students with many benefits, including a comprehensive travel service, a health insurance scheme, and the opportunity to engage in and discuss extensively matters such as education, welfare and ABSCHOL. In addition AUS enables students to enjoy an exchange of ideas with other universities. One of the very active organizations at La Trobe is the ABSCHOL committee which is committed to helping Aborigines achieve basic rights, especially in the field of education.

In addition the SRC promotes 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 40 clubs and societies, and by publishing a weekly newsletter, a magazine and a bi-weekly newspaper.

In September, 1970, the present SRC was elected into office and although bedevilled by internal dissent between those who viewed the SRC more as the provider of services and facilities and those who saw

the SRC in political terms, by September the Council had accepted the new constitution which at long last made the SRC official.

Under the new constitution the SRC executive has been abolished and 10 SRC standing committees have been established (finance, publications, activities, facilities, planning and management, AUS (education), AUS (other than education), clubs and societies, constitutional and legal affairs, housing and advisory services and public affairs.

Enquiries may be made to the honorary secretary, SRC office, the agora.

Clubs and Societies

A university course includes more than academic study, and the following clubs and societies are registered with the SRC: Labour Club, Muslim Union, Newman Society, Philosophy Society, Agricultural Students, Amnesty International, Asian Students Association, Ballroom Dancing Club, Chemical Society, China Society, Communist Club, Community Aid Abroad, Conservation Society, Contemporary Dance Group (Modern Ballet), Democratic Club, Ecological Society, Education Society, Christian Union, Film Society, Film Production Group, Folk Club, Forum for Advancement of Education, Jewish Students Association, Physics Society, Social Involvement, Strawberry, Student Christian Movement, Students for a Democratic Society, Theatre Group, World University Service, Yoga Society, Motor Cycle Club, Anarchist, Association of Sociology Scholars, Economic Society, Fabian Society, French Club, Literary Society, Moderate Student Alliance, Music Society, Photographic Society, Women's Liberation.

Rabelais

The student newspaper of La Trobe University, *Rabelais*, is designed to provide news, information and articles of general interest to the students. It is edited and staffed by students, and financed by the SRC and advertising. Contributions and staff are always needed to keep the newspaper operating, and students are welcome to help.

Enquiries may be made to the editor, *Rabelais*, the agora.

Student Travel Loan Fund

A committee of the SRC grants interest-free loans to students who wish to participate in a travel scheme and who do not have sufficient funds to meet the full cost of fares and living expenses while overseas.

For further information enquiries should be made at the SRC Office.

COMMONWEALTH UNIVERSITY SCHOLARSHIPS

Commonwealth university scholarships are available in all first degree courses and in the Diploma of Education course. The courses approved can be taken by part-time study as well as full-time study. In general, selected students will be free to apply their scholarships to any

single approved course. Students interested in combined courses should seek advice from the Department of Education and Science.

Closing date for an application is 30 September

Awards of university scholarships are made in three categories:

Open Entrance

Open to students under 30 years who are permanent residents of Australia and who are doing or have done matriculation. Awarded on the basis of results in the three best subjects (excluding English expression) at the higher school certificate examination in four or more subjects. However, an adjustment is made in respect of additional subjects taken and account is taken of whether a student is repeating the examination.

Later Year

Open to undergraduates in any year of their course who are under 30 years of age and permanent residents of Australia and who have completed the equivalent of at least one year of full-time study in an approved course. Awarded on the basis of results gained from the commencement of the applicant's first approved university course.

Mature Age

Open to students who are over the age of 30 years and under 40 years of age and who are permanent residents of Australia. Awarded either on results obtained in the higher school certificate examination or, if the applicant has already commenced an approved university course, on his academic record in the course.

Benefits

All compulsory fees will be paid irrespective of the means of the scholar's parents. In addition, scholars who are undertaking full-time courses on a full-time basis may apply for a living allowance which will be subject to a means test. Allowances are paid on a graduated scale, the maximum allowance being \$700 a year for students living at home and \$1,100 a year for students living away from home under approved circumstances.

The maximum allowance is payable where the family's income is \$2,800 a year or less and some allowance is payable on a reducing scale up to an income of \$6,026 a year for students living at home and \$7,360 a year for students living away from home.

These conditions are reviewed annually.

Number Available

Open entrance: 8,500 throughout Australia.

Later year: 4,000 throughout Australia.

Mature age: A small number only is available.

There is no contract of service.

Further information may be obtained from the Regional Director, Department of Education and Science, 99 Queen Street, Melbourne, Vic. 3000.

LA TROBE UNIVERSITY RESEARCH SCHOLARSHIPS

A number of postgraduate scholarships tenable at La Trobe University will be awarded in 1972.

Eligibility

Graduates or graduands of any Australian or overseas university are eligible to apply. An applicant should hold at least a class 2A honours bachelor degree or the equivalent qualification, or should be completing the final year of a course leading to such a degree.

Research

The purpose of the scholarship is to enable 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 department.

If an applicant's proposed course of research will require knowledge of any language other than English, he should attach a note giving details of his present level of knowledge of the relevant language covering speaking, reading and writing ability.

Tenure

Scholarships are tenable as follows:

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

Ph D candidates — normally up to a maximum period of three years with a possible extension for a fourth year.

The scholarship will be tenable in the first instance from the date of beginning work at the University until 31 December of the same year.

Subsequently annual renewal may be made up to the maximum period shown above.

Stipend and Other Allowances

Masters' and Ph D scholarships — stipend \$2,000 a year. (Stipends are exempt from income tax.)

In addition to the stipend, the following allowances apply:

Married scholar with dependent wife and one child, additional \$300 a year.

For each additional child to a total of three in all, \$100 a year.

In special circumstances consideration may be given by the University to granting assistance up to \$300 a year to married scholars without children.

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.

Exemption from compulsory University fees.

Assistance with personal travelling expenses for applicants within Australia or from New Zealand.

Assistance with transporting personal belongings for applicants within Australia and from New Zealand up to a maximum of \$25.

An allowance of up to \$100 for costs incurred in typing and binding a thesis. (Where two theses are submitted — master's followed by a Ph D — two claims may be made but the total will not exceed \$100.)

Additional Income

A scholar may, with the approval of the chairman of department concerned, supplement his stipend by undertaking tutoring or demonstrating in a field related to his research, up to a maximum of 150 hours a year, normally at a rate not exceeding six hours per week. (Remuneration not exempt from income tax.)

Applications

Applications for a La Trobe University Research Scholarship should be made in triplicate on the appropriate application form which may be obtained from the University. Applications close with the Registrar on 31 October.

Academic Record

A copy of an official statement from the applicant's university of his academic record *must be included* with the application forms. If an applicant has a final result pending, he should send a copy of his academic record showing his examination results to date.

COMMONWEALTH POSTGRADUATE AWARDS

Research

The Commonwealth Government each year makes available a number of postgraduate awards which are allocated amongst the universities by the Commonwealth Scholarships Board.

Applicants must be permanent residents of Australia at the time of application. Overseas students coming to Australia to begin a postgraduate course are not eligible for awards.

Applicants 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 with possible renewal for a fourth year for students proceeding to a doctorate.

The stipend is \$2,600 a year, plus a dependants' allowance of \$450 a year (for wife and child or children).

In addition to the stipend, travelling, settling in and thesis allowance will be paid.

Applications for a Commonwealth Postgraduate Award should be made in triplicate on the appropriate application form which may be obtained from the University. Applications close with the Registrar on 31 October.

Course

Special awards are offered by the Commonwealth Government for students wishing to undertake full-time postgraduate study in courses more than 10 years from the year of graduation.

Applicants must be permanent residents of Australia at the time of application. Students from overseas who have permanent residence status in Australia and who declare their intention to remain in Australia after completion of their studies are also eligible. Such students must be resident in Australia at the time of application.

Applicants 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.

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

The stipend is \$2,600 a year, plus a dependant's allowance of \$450 a year (for wife and child or children).

In addition to stipend, travelling, establishment fees and other allowances will be paid.

Applications for a Commonwealth Postgraduate Course Award should be made on the appropriate form available from the Registrar.

Applications close with the Registrar 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. They are for full-time study only and are for the minimum period required to complete the course.

The studentship may be extended to include fourth year of an honours degree.

Benefits

The award pays tuition fees and an allowance of \$1,338 per year for first-year students, rising to \$1,747 in the fourth year, with \$70 additional for those living away from home.

For undergraduate and graduate entrants the allowances are:

Completed first year: \$1,731-\$2,128

Completed second year: \$2,403-\$2,562

Completed degree: \$3,180

There are separate rates 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' College, La Trobe University.

NATIONAL SERVICE

A student liable for national service who requires a certificate of enrolment on his deferment claim form should lodge this form for endorsement at the counter of the Student Administration branch.

The University can certify only a student's current enrolment. If a further course is planned Part D of the form should be completed or a separate statement attached. This does not apply to a student who is enrolled for a concurrent course (BA, B Ec, B Agr Sc, Dip Ed course). The following remarks summarise the present deferment policy of the Commonwealth Department of Labour and National Service.

Deferment is usually granted to a student to complete a course for which he is enrolled at the time of registration, subject to the overriding qualification that the ground of deferment does not prejudice the student's rendering of service, liability for which now ceases at the age of 30 years. This now covers all students both undergraduate and post-graduate.

Every deferment is granted on the condition that it will be reviewed annually, and that the student must continue to make satisfactory academic progress. A student who has been granted deferment will be liable to undertake national service on termination of that deferment.

Where preferred, a student required to register may elect to serve in the Citizens Forces (Citizen Naval Forces, Citizen Military Forces, and Citizen Air Force) as an alternative to National Service. This option is open to those who are already serving and to those who intend to make immediate application for enlistment. In each case, the undertaking to serve for the prescribed period must be completed and signed before the ballot for a registrant's particular age group. Those who continue to serve efficiently and continuously for this period will not be required for national service. Those Citizen Force members, excluding members of the Victorian University Squadron Citizens Air Force, who have at least one year's efficient service before registration for their age group,

will be required to serve for five years. Registrants with less will be required to serve efficiently for six years.

The information sheet which is a section of the registration form explains these deferments in more detail. Further information may be obtained from the Commonwealth Department of Labour and National Service, National Service Registration Office, Princes Gate Building, 151 Flinders Street, Melbourne, 3000, or any district employment office of the Commonwealth Employment Service.

PUBLIC TRANSPORT

Copies of bus timetables and fare concession application forms are available at the Student Administration Branch. General transport information including a map showing public transport routes is placed on the official notice board. For information on tram, train and bus services in the metropolitan area, ring the Transport Information Centre on 63 0141. For services in the country, ring 63 0202.

Bus Routes to the University

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

1. 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.
2. Ivanhoe Bus Company route:
Deepdene (Burke Road Tram Terminus), Ivanhoe railway station*, Heidelberg Repatriation Hospital, West Heidelberg, La Trobe University.
3. Dyson's Bus Service routes:
 - (i) Regent railway station* or Northland, East Preston tram terminus*, La Trobe University, Janefield.
 - (ii) Regent railway station* or Northland, East Preston tram terminus*, La Trobe University, Greensborough railway station*.
 - (iii) 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.

4. Mees' Bus Lines route:
East Rosanna (corner of Graham and Warren roads), Macleod railway station*, La Trobe University.

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.

ADMINISTRATION INFORMATION

Undergraduates — Admission to a Course

Entrance Requirements

A prospective student must satisfy, or be exempted from, the university entrance requirements specified by the Victorian Universities and Schools Examinations Board.

In exceptional circumstances consideration may be given to an application for admission by a person who has not passed the English expression paper in the higher school certificate examination but has obtained meritorious results in other subjects (including any prerequisite subjects specified for a School) in that examination.

The current edition of the Board's handbook is available from the Secretary, Victorian Universities and Schools Examinations Board, 437 St. Kilda Road, Melbourne, 3004.

In addition to the requirements specified in the handbook a prospective student seeking admission on the basis of the mature age provisions (that is not less than 35 years of age) must have passed English expression at the Victorian higher school certificate examination or a special test in English and two subjects at the Victorian higher school certificate examination in accordance with the requirements specified for admission to the particular school. Although the Schools of Social Sciences and Humanities do not have course prerequisites, it is suggested that an intending student choose higher school certificate subjects appropriate to those disciplines in which he will seek enrolment. It should be noted however that, in respect of the School of Social Sciences, a candidate is unlikely to gain selection if he has presented for two foreign languages, two science subjects or has included biblical studies or any of the music subjects.

Course Prerequisites — 1972

The details below refer to passes in the Victorian matriculation or higher school certificate examination.

School of Agriculture. A pass in chemistry and either physics or a branch of mathematics.

School of Biological Sciences. A pass in chemistry and in any one subject from physics, biology or a branch of mathematics.

School of Humanities. There are no degree course prerequisites.

School of Physical Sciences. A pass in one of the following combinations of subjects:

- (a) Any two of chemistry, physics, pure mathematics, calculus and applied mathematics,
- (b) General mathematics and either chemistry or physics.

School of Social Sciences. There are no degree course prerequisites. Details of subject prerequisites are included under subject headings and within the Table of Subjects.

How to Apply

Application forms 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 from the Secretary, Victorian Universities Admission Committee, 450 St Kilda Road, Melbourne, 3004.

An application fee of \$6.00 must be submitted with the form. All applications submitted by 29 October will be acknowledged in December. An applicant who seeks advice about studies completed elsewhere should contact the Student Administration branch (telephone 478 3122, extension 2004) in the first instance.

Acceptance of an Offer

Acceptance of an offer must be made promptly. When accepting the offer, a student is required to:

- (a) discuss the proposed course with an adviser of studies,
- (b) complete the registration forms prescribed for that year,
- (c) pay part of the annual fees or produce evidence of a scholarship,
- (d) have a photograph taken for, and subsequently collect, student card.

Undergraduates — Continuing Enrolment

A student who wishes to continue a course commenced in any School except Agriculture in 1972 must seek an interview with an adviser of studies. Details of arrangements for interviews will be posted on the official notice board during October.

A student in the School of Agriculture is not required to attend an interview with an adviser of studies, however the enrolment application should be forwarded through the office of the dean by mail or personally if preferred.

Completion of the enrolment procedure requires:

- (a) submission of the prescribed forms through the office of an adviser of studies, except in the case of the School of Agriculture (see above),
- (b) payment of part of the annual fees or production of evidence of a scholarship not later than 10 March 1972,
- (c) notification of a residential address for office correspondence by 10 March 1972,
- (d) presentation of the student card to the Student Administration branch for updating.

An application for enrolment may be rejected if fees or other monies owing from the previous year of enrolment are not paid.

Postgraduates

Admission to a Course

Details of the application procedure and the appropriate forms are available from the Graduate Studies office.

An applicant who is accepted as a candidate will be advised of the registration procedure in the letter notifying the approval and terms of candidature.

Continuing Enrolment

A student who is expected to continue a candidature in 1972 will be sent enrolment papers, by post, in December of 1971.

If a student expects to complete all the requirements specified in respect of his candidature before 31 March 1972 he need not re-enrol. The student should, however, advise the Graduate Studies office of the expected completion date.

Fees

The scale of fees for 1972 and details of the fees procedure will be issued to each student as a separate booklet.

Refund of Fees

If a notice of withdrawal is received before the end of the first week of first, second or third term, the fees paid for that term will be refunded. A student who formally completes the withdrawal procedure after the end of the first week and before the end of the fourth week of first or second term may receive a refund of part of the fees paid for that term in which the withdrawal is effected.

A refund will not be made until the student card has been returned. The fees payable are calculated on the following basis for the term in which the withdrawal is made.

First and Second Term

End of first week — no fees.

End of second week — 25 per cent of fees.

Up to end of fourth week — 50 per cent of fees.

After end of fourth week — full fees.

Third Term

End of first week — no fees.

After end of first week — full fees.

Note: There is no refund of fees made in respect of a withdrawal effected after the end of the first week of third term.

Examinations

A student may present for the annual examination in any subject for which he has maintained an effective enrolment — i.e. registered, paid all fees — and where his progress during the year has been considered satisfactory.

A provisional examination timetable is published towards the end of second term to enable possible examination session clashes to be

checked. The final examination timetable is available for collection from the Student Administration branch towards the end of September.

A student who considers that his performance in examinations has been or will be impaired by illness or other causes may seek special consideration by submitting the appropriate application together with appropriate medical evidence and other supporting statements. The forms are available from the Student Administration branch.

The pass grades adopted by the University for the final assessment of each undergraduate pass or honours subject are:

- A — 80 to 100
- B — 70 to 79
- C — 60 to 69
- D — 50 to 59
- P — Ungraded pass
- NC — Pass conceded

In certain cases, an aegrotat pass may be awarded. This is indicated by an asterisk immediately following the grade — eg. D*. Other grades are detailed on the memorandum of results.

Annual examination results (pass grades only) are posted on the official notice board.

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

The grades awarded for masters degrees are:

- | | | |
|---------------------|---|----------------------|
| Master of Arts | } | First class honours |
| or | | Second class honours |
| Master of Economics | } | Pass |
| Master of Education | | |
| or | } | Pass |
| Master of Science | | |

Class Timetables

A timetable for lectures and laboratory is produced towards the end of the preceding year. Continuing students should consult this timetable before selecting subjects for the current year. Amendments to the timetable are posted on the official notice board. Revised editions of the timetable are generally produced for second and third terms. Copies of the timetable are available from the Student Administration branch.

Variation of 1972 Course

An accepted enrolment may be varied by the deletion of a subject (or subjects) and the inclusion of another subject or subjects, alteration of a course or a transfer from one School to another. A student may request permission to vary his enrolment up to 31 March. To do so he must complete a 'variation of 1972 course' form. Copies of this form will be available from the advisers of studies. The completed form must be returned to an adviser of studies.

Withdrawal of Enrolment

A student may apply to withdraw an enrolment by completing a 'withdrawal of 1972 course' from which is available from the advisers of studies or the Student Administration branch.

A withdrawal is not effective until the end of the week in which the form, together with the student card, is received at the Student Administration branch. Fees are assessed up to this time.

A withdrawal will be recorded as:

K1 — First term

K2 — Second term

K3 — Third term

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.

Residential Address for Official Correspondence

The University requires a current residential address for official correspondence. An address such as C/- P.O. Box 12 is not acceptable; a non-resident student may not specify a college address.

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 each year thereafter while the student concerned remains at the University.

It is part of the registration procedure to have a photograph taken during the first year; the student card is a photographic by-product of this process. Failure to present this card, when requested, may cause inconvenience to the student concerned. 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 at a fee of \$1.00. 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.

Official Notice Board

The official notice board is located on the eastern wall of the first level of the library. 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 this notice board.

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 ^{finds} will find) is a modern version of the La Trobe family motto.

trouvera

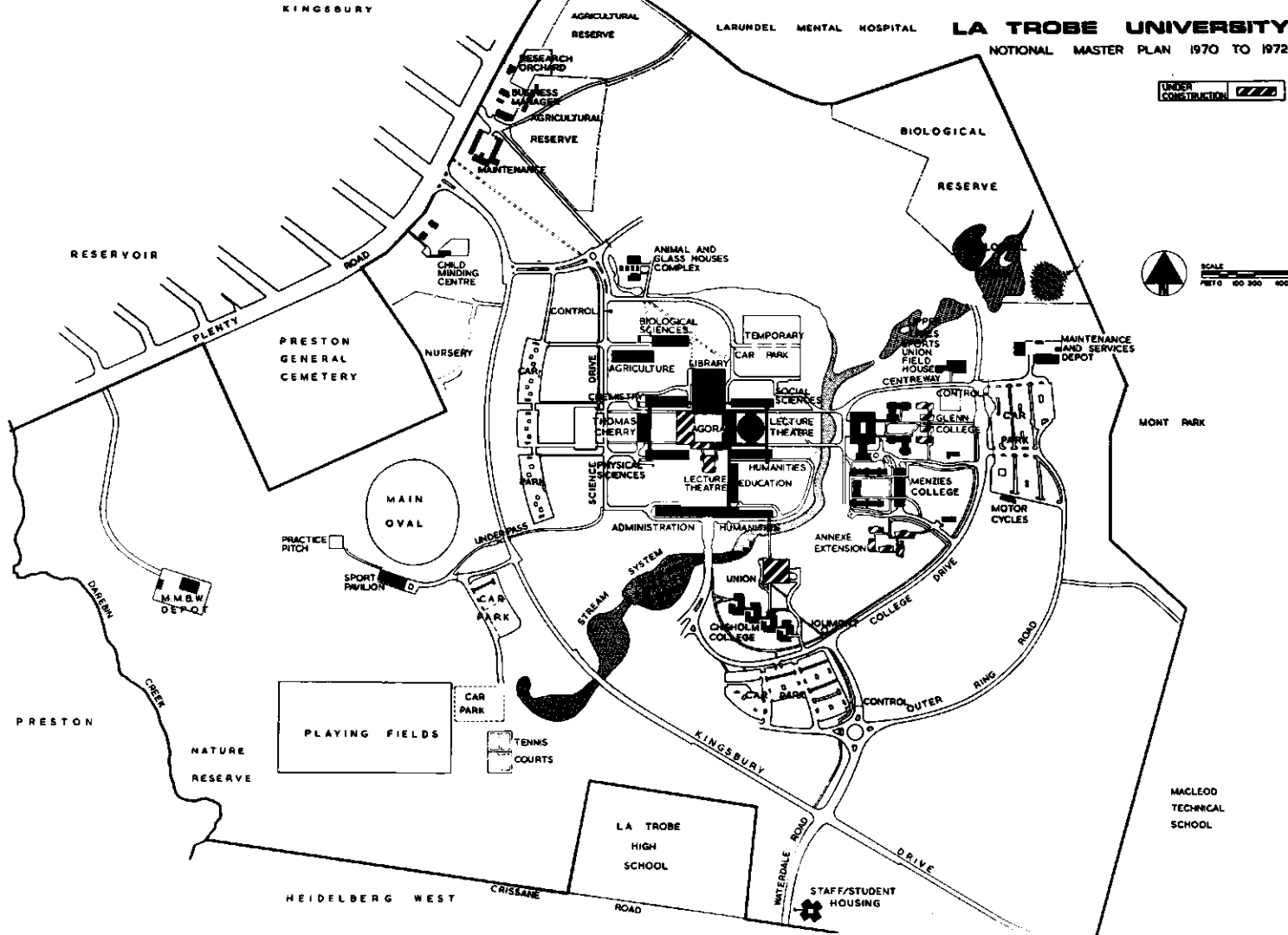


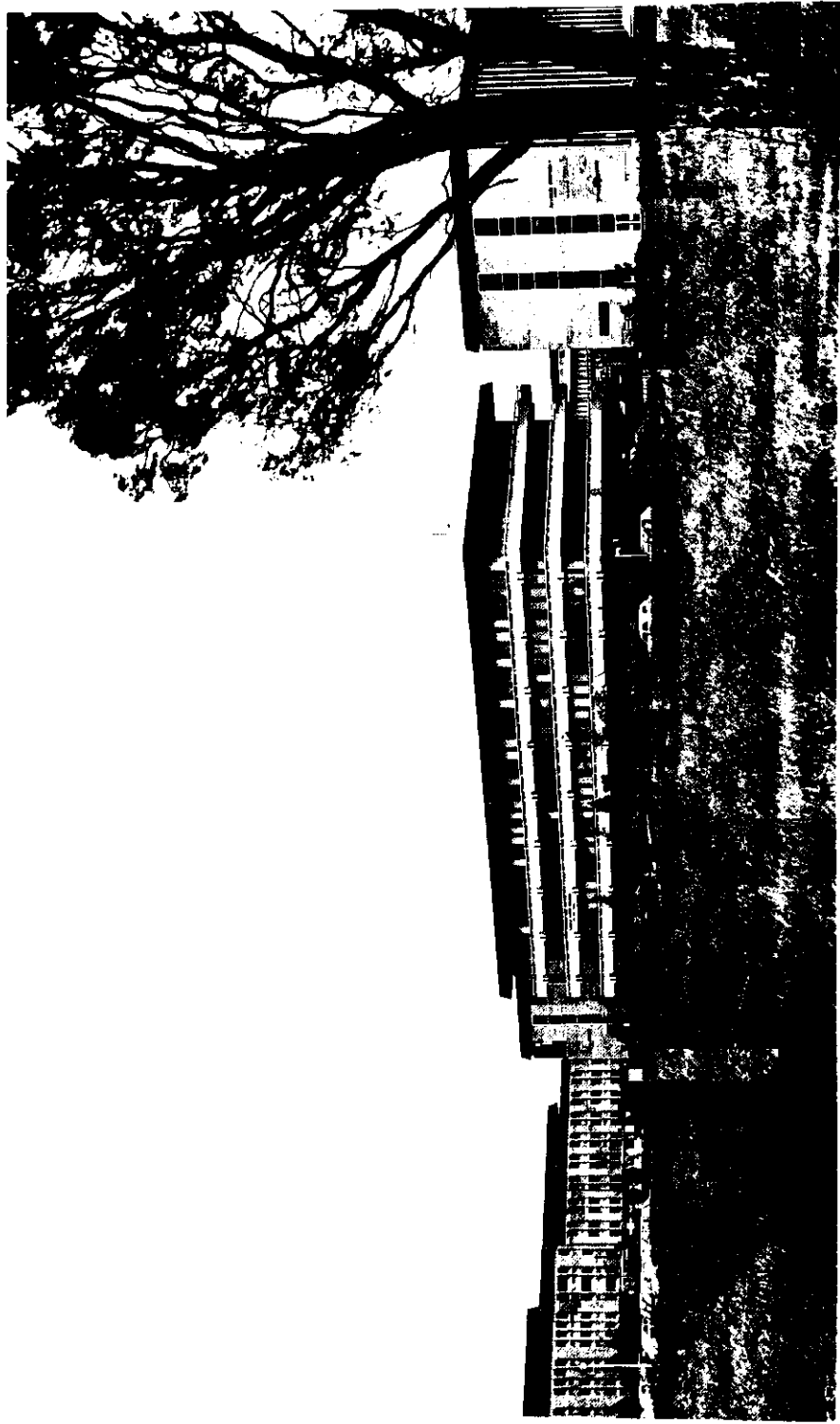
KINGSBURY

LARUNDEL MENTAL HOSPITAL

LA TROBE UNIVERSITY

NOTIONAL MASTER PLAN 1970 TO 1972

UNDER
CONSTRUCTION
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The science buildings



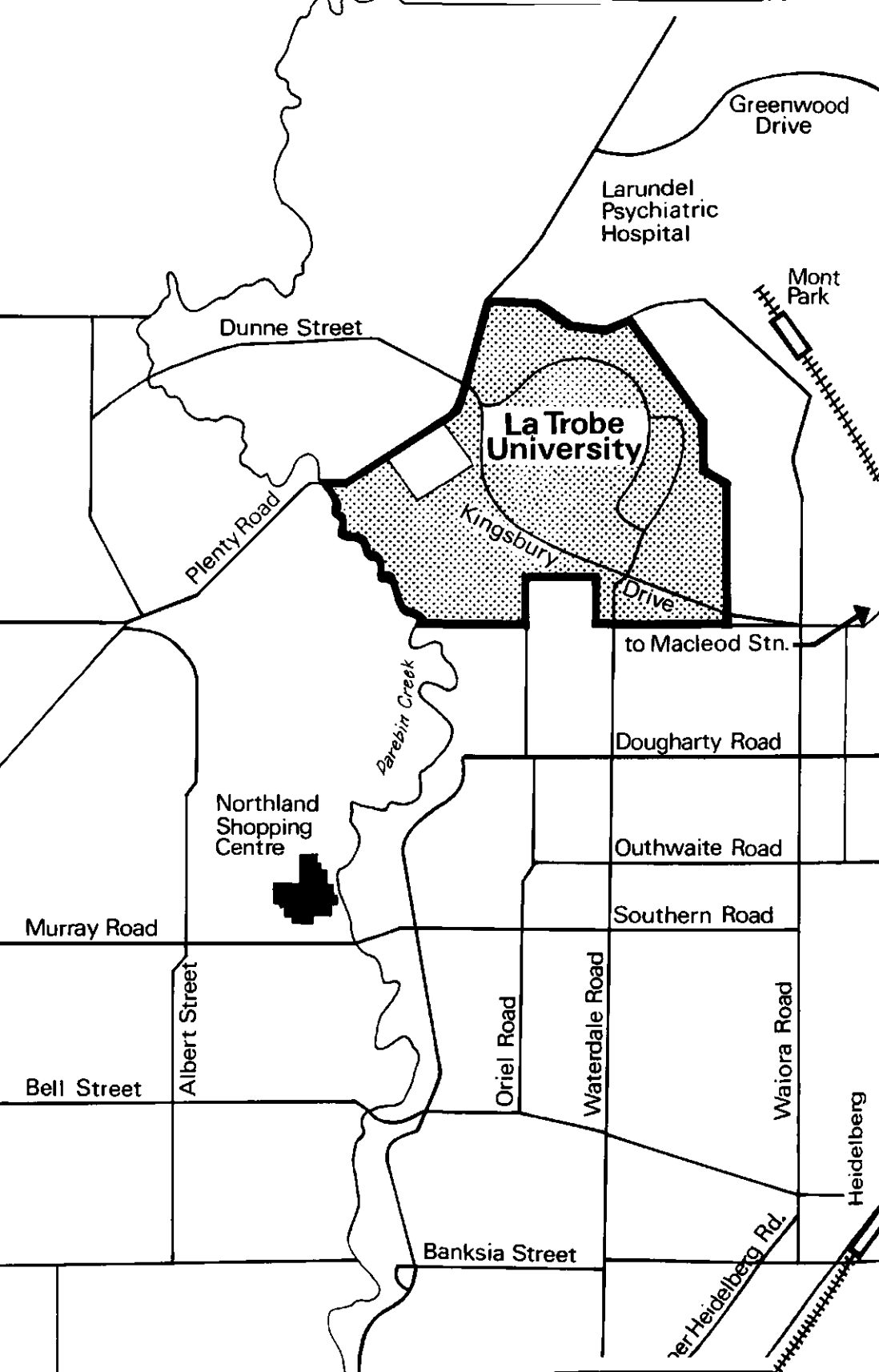
Thomas Cherry fountain



Glenn and Menzies colleges



University flats



SCHOOL OF AGRICULTURE

PART II: SCHOOL OF AGRICULTURE

GENERAL INFORMATION

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 sciences 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.

The course leads to a B Agr Sc (pass or honours degree) at the end of four years. Honours graduates may then do postgraduate course work and research in a specific area of agricultural biology or in agricultural economics, leading to a M Agr Sc or Ph D degree. In the case of the M Agr Sc degree, the emphasis may be either towards further course work or towards research in the chosen area. Students intending to enter the teaching profession may begin study for the Diploma in Education in the third year, that is, they may study for the Dip Ed concurrently with their study in agricultural science, thus extending the course to five years.

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 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 firms. 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 conservation and land use in the coming years.

Some 15 acres of the University campus is presently used by the School of Agriculture for field work involving crops, pastures and livestock. This gives students day to day contact with agricultural experi-

SCHOOL OF AGRICULTURE

mentation as well as with the more applied aspects of crop and animal husbandry.

All students are required to obtain at least 12 weeks' practical experience on approved farms for which no more than four weeks' credit can be gained on any one property. Students with a farming background and students holding a diploma from a recognized agricultural college may be granted exemption from part or all of this requirement. Under special circumstances, students may also be given credit for practical work in non-farm activities associated with agriculture.

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. Any prospective student who is unable to satisfy the prerequisites should write to the Registrar, giving full details of previous educational background, because requirements may be waived in special cases. 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

In view of the shortage of accommodation in relation to the demand for places, the number of students admitted is restricted. For those students seeking entry direct from the higher school certificate examination the basis of selection is academic merit judged in the first instance by reference to their examination results. Other candidates may be required to attend for interview by the selection committee which will take into account all special circumstances. Such candidates who will be unable to attend for interview between 14 January and 9 February should write to the School as early as possible.

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 committee of the School reviews 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.

SCHOOL OF AGRICULTURE

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

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 is a course of 60 lectures, with one 3-hour practical class a week in one term. Principles of climatology, with particular reference to physical aspects; climate and vegetation, soils and pasture; climate as a factor in agricultural production and land use, with particular reference to soil-plant-animal relationships; world agriculture and types of rural economy in relation to population, living standards, diet and consumption; the role of agriculture in economic development. Agricultural botany; the classification and identification of plants (weeds, grasses and legumes) important to agriculture. Each student must present a plant collection at the end of the year.

Second-Year Course

The second year includes Agriculture IIA (animal anatomy and physiology), Agriculture IIB (soil science), Biology II (plant anatomy and physiology, agricultural genetics — see under biology), and Chemistry IIB (see under chemistry). Of these, Chemistry IIB is one-third of the work load and the other three subjects each two-ninths.

Agriculture IIA is a course of about 60 lectures and 25 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 influence of the chemical properties of soils on the growth of plants. Processes of soil formation; physiology, nutrition and ecology of soil micro-organisms; chemistry of soils, with emphasis on essential plant nutrients in relation to their availability to plants.

SCHOOL OF AGRICULTURE

Third-Year Course

Agriculture IIIA (animal sciences), Agriculture IIIB (soil-plant sciences) and Agriculture IIIC (economics, agricultural economics 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*: 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 one-hour and three-hour 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 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*: two lectures and one tutorial a week for the first half of the year, comprising the first half of Economics IIA offered by the Department of Economics. Topics include the price mechanism; its advantages and deficiencies as an allocator of resources; opportunity cost, demand and supply; difficulties in deriving demand and supply curves; limitations to the concept of equilibrium of demand and supply; the concept of elasticity; profit maximization and marginal concepts; pure competition, imperfect competition, monopoly and oligopoly; countervailing power; full-cost and

SCHOOL OF AGRICULTURE

ratchet views of pricing behaviour; empirical data on pricing behaviour; microeconomic policy. *Production economics*: two lectures and one tutorial a week for 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; expected monetary value; pay off tables: win/loss ratios; planning under risk situations; planning under uncertain situations; minimizing income variations; complementary products; competitive products; resource allocation at the national policy level. *Statistical methods*: one lecture and one tutorial 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. (Part of the statistical methods section may be given in second year in 1972).

Fourth-Year Course

Students are given considerable freedom of choice, subject to availability of staff and facilities, in selecting areas of study, and in the relative emphasis given to the basic and applied aspects of these areas. Formal contact hours (lectures and practical classes) are the minimum necessary to complete the basic requirements of the course (see below); at least half the year's work is done by the student on his own initiative, following his own interests.

As in the 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). The student can largely decide the emphasis given to each subject, but must comply with certain minimum requirements in each. Applications to take units of subjects offered in other Schools will also be considered.

The basic (minimum) courses are — *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 on selected topics of special interest in animal husbandry.

Agriculture IVB: A two-term course of lectures plus practicals. Part of the course is devoted to *Entomology* — a brief synopsis of insect

SCHOOL OF AGRICULTURE

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 interest in the plant-soil science fields.

Agriculture IVC: The course has two components, *Sociology and extension* — 12 lectures in second term. Communication — a fundamental process in research and extension; why we communicate; a model of the process; the concept of feedback; characteristics of the source, message, channel, and receiver of a communication and how they influence effects; perception — how we see the world and people around us; empathy—the capacity to see the world from another's viewpoint, its importance in agricultural extension; meaning — the development of common understanding, a problem among scientists as much as between extension worker and farmer; organizations — the working climate for scientists and extension workers; the flow of communication within and between organizations and to the world outside. Filtration and overload — pathological communication; 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. Topics in production economics — review and expansion of basic principles; the degree of the production function; the reversability of the factor-product relationship; the estimation of response surfaces; functional forms for production functions; economies of size and scale; eulers theorem; residual imputation techniques; asset fixity. Topics in farm management — 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. Topics in agricultural economics — agricultural marketing; agricultural prices; organization in agriculture; government intervention and agricultural policy; farm finance; evaluation of public investment in agriculture; technical change.

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.

Compulsory half-day and full-day excursions form part of the second, third and fourth years. The major optional excursions, from two to five days' duration, will be in the last week of the August vacation in third and fourth years, and may cost from \$25 to \$50 each. Full or half-day excursions on free days or free afternoons during term may be arranged, as opportunity offers, in all years and may cost about \$1 each.

BIOLOGICAL AND PHYSICAL SCIENCES

PART III: SCHOOLS OF BIOLOGICAL AND PHYSICAL SCIENCES

SCHOOL OF BIOLOGICAL SCIENCES

Four disciplines are offered in the School of Biological Sciences: biochemistry, botany, genetics 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.

The details of the course structure for this School are found under the heading of the degree of Bachelor of Science in the Schools of Biological Sciences and Physical Sciences. With the approval of the School the student may choose from a wide range of combinations of subjects from biological and physical sciences. Agriculture I offered by the School of Agriculture may also be chosen subject to approval of the School.

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, calculus and 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 units. 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. Students enrolled in the School who wish to take a unit in mathematics are required to take Mathematics 1A. Mathematics 1C is available only to students enrolled in other Schools.

At the second-year level where three units are required a student may offer one unit from the School of Biological Sciences or one in philosophy, or the composite unit Physical Sciences II.

One unit of biology or philosophy or the composite unit Physical Sciences III may also be offered at third-year level.

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.

BACHELOR OF SCIENCE

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

A person is required to enrol for the pass-degree course in either the School of Biological Sciences or the School of Physical Sciences. With the approval of the appropriate Board of Studies a student may change Schools after the first year or, exceptionally, after the second year.

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.

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.

A student who has been awarded either the Bachelor of Economics or the Bachelor of Arts degree may complete the Bachelor of Science degree by undertaking such additional subjects as the School may approve equivalent to a further two years of full-time work.

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 the 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.

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 are

BACHELOR OF SCIENCE

not acceptable for this purpose.) Disciplines available in the Schools of Humanities and Social Sciences are economics, English, French, history, legal studies, 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, Mathematical Statistics II, Philosophy IIA and IIB, Physics II, Pure Mathematics II, Physical Sciences II, Zoology IIO or IIP. 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 and Zoology IIO or IIP.

Students taking the combined science/economics course can choose two units from the physical sciences subjects with two 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, Chemistry IIIA, Chemistry IIIB, Genetics III, Mathematical Statistics II, Philosophy IIIB, IIIC, IIID, IIJ, IIK and IIIN, Physics IIIA, Physics IIIB, Pure Mathematics III, Physical Sciences III, Zoology IIO, IIIS or IIIP.

Chemistry IIIA and IIIB cannot be taken in combination.

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.

BACHELOR OF SCIENCE

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, mathematics and physics and one of an interdisciplinary nature. The School of Biological Sciences offers honours courses in biochemistry, botany, genetics 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 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.

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,

GRADUATE STUDIES

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 IV: PSYCHOLOGY

The Department of Psychology, which is to be a foundation department of a School of Behavioural Sciences soon to be established, will offer courses leading to the degrees of Bachelor of Arts and Bachelor of Science. In 1972, only Psychology I is offered and may be taken either as a prerequisite for further sequences of courses which will be available after 1972, or as a terminal course. There will be a quota on the number of students permitted to enrol in Psychology I in 1972.

Students wishing to major in psychology should enrol in the School of Behavioural Sciences. Psychology I will also be available for students enrolled in the Schools of biological sciences, humanities and social sciences, either as a terminal course, or as part of a sequence of two or three units in psychology.

The course is designed to introduce the student to a study of selected areas of human and non-human psychology based on empirical studies and theoretical principles underlying the various fields of the discipline.

Bachelor of Science Degree. The prerequisites for students enrolling for the B Sc degree in the School of Behavioural Sciences are passes in the Victorian higher school certificate examination, or an approved equivalent, in chemistry and any one subject from physics, biology or a branch of mathematics. A major sequence in psychology for the B Sc degree in the School will consist of three units, Biology IB will be a prerequisite for entry into the second year psychology courses.

Bachelor of Arts Degree. There are no prerequisites for students enrolling for the BA degree in the School of Behavioural Sciences, but students wishing to major in that School will be required to take three units in psychology and a subject consisting of components of biology and statistics.

B Sc (Honours) and Higher Degrees. Students wishing to obtain the degree of B Sc (honours), M Sc or Ph D will be accepted by the Department of Psychology provided their previous academic record is of high standard. Prospective candidates should contact the chairman of the department for further information.

Details of the Psychology I course offered in 1972 are shown in the disciplines section of this handbook. Details of degree structures for the BA and B Sc degree will be available from the Psychology Department.

AGRICULTURE

PART V: 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.

BIOCHEMISTRY

The Department of Biochemistry, in the School of Biological Sciences, 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 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 and with chemistry. 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. It should be further supported by adequate mathematics and physics. The courses set out below incorporate these features.

First Year: Either Biology IA, Biology IB, Chemistry I, Maths I or Physics I

OR Biology IA or IB, Chemistry I, Physics I, Maths I.

Second Year: Biochemistry II and two of Botany II, Genetics II, Zoology II or Chemistry II.

Third Year: Either Biochemistry III and one of Botany III, Genetics III or Zoology III

OR Biochemistry III and Chemistry III.

Details of the courses offered by the Biochemistry Department are described below. Further information may be obtained from the chairman of the department.

BIOCHEMISTRY II

Syllabus: An introduction to the chemistry and metabolism of amino acids, proteins, carbohydrates, lipids and nucleic acids. The chemical

BIOCHEMISTRY

aspects of enzyme action, enzyme kinetics, the role of co-enzymes. Energetics of cellular metabolism. An introduction to the control of metabolism.

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

Class Requirements: A course of three lectures a week and an average of three hours practical work a week throughout the year in experiments concerning techniques in quantitative biochemistry.

Books: No textbook is prescribed but the following provide a good general coverage of the material in the syllabus.

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

Lehningear, A. L. *Biochemistry* 2nd edn, Benjamin 1971

McIlvery, R. W. *Biochemistry — A Functional Approach* Saunders 1970

The following are recommended for reference in relation to specific sections of the course:

Cohen, G. N. *The Regulation of Cell Metabolism* Holt, Rinehart and Winston 1968

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

Mahler, H. R. and Cordes, E. H. *Biological Chemistry* Harper 1966

Examinations: In addition to one 2-hour and two 3-hour written papers, to be given at the end of the course, written and practical tests may be given during the year. Performance in practical work will be taken into account in the final assessment.

BIOCHEMISTRY III

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 — differentiation, ontogeny of enzymes, organogenesis. Biochemical evolution.

Class Requirements: A course 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.

Books

Dawson, R.M.C., Elliot, D., Elliot, W. M. and Jones, K. M. *Data for Biochemical Research* 2nd edn, Oxford Univ. Pr. 1969

A list of books recommended for reference will be supplied.

Examinations: In addition to three 3-hour written examinations to be given at the end of the course, written and practical tests may be given

BIOLOGY

throughout the year. Performance in practical work, experimental projects and written assignments will be taken into account in the final assessment.

Prerequisite: Biochemistry II.

HONOURS

A one-year honours course in biochemistry is available to graduates with a B Sc or with an equivalent qualification from other universities. The course will consist of a research project, together with some special lectures, seminars and a literature review.

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. These are courses in botany and zoology respectively, with a course on genetics and evolution common to both subjects. Unless given special permission to the contrary, students must pass both subjects to proceed to any second-year subject. Details of second-year and subsequent studies in the School of Biological Sciences can be found under the headings Biochemistry, Botany, Genetics and Zoology.

BIOLOGY IA (BOTANY AND GENETICS) AND BIOLOGY IB (ZOOLOGY AND GENETICS)

Prerequisites For 1972: 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.

Syllabus

(BOTANICAL COMPONENT) BIOLOGY IA (50 Lectures)

This course is designed to introduce students to the major disciplines of botany and also to serve as a one-year terminal course for students enrolled in other Schools.

Topics covered are:

1. Structure and physiology of higher plants including studies of the ultrastructure of plant cells (25 lectures).
2. A survey of the major groups of plants with emphasis on evolutionary considerations (20 lectures).
3. Studies of the relationship between plants and the environment — an introduction to the principles of plant ecology (five lectures).

(ZOOLOGICAL COMPONENT) BIOLOGY IB (50 Lectures)

This course 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 was not designed as such.

BIOLOGY

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.

(GENETICAL COMPONENT) BIOLOGY IA AND BIOLOGY IB (25 Lectures)

The following course is common to Biology IA and IB: 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.

Class Requirements: Lectures — three a week for three terms. Practical tutorial classes one 4-hour class a week for three terms; one excursion (Biology IB). The botanical and zoological components of Biology IA and IB will consist of 50 lectures with corresponding practical classes, and the genetical component will be a course common to both subjects consisting of 25 lectures with corresponding practical classes.

Special Requirements: Students are advised to attend all lectures and practical-tutorial classes offered, and to purchase necessary instruments. A list of such instruments will be made available by the School of Biological Sciences.

Prescribed Reading

Keeton, W. T. *Biological Science* Norton 1967 (general text)

Stebbins, G. L. *Processes of Organic Evolution* Prentice Hall 1966

Raven, P. H. and Curtis, H. *The Biology of Plants* Worth Publications Inc. 1970.

OR

Johnson, Delanney, Williams and Cole *Principles of Zoology* Holt, Rinehart and Winston 1969

Genetics Notes, by the Department of Genetics

Students are advised to consult the student advisers prior to the beginning of term one as to the most suitable books to purchase.

Postgraduate Studies

Students wishing to obtain the degree of B Sc (Hons), M Sc or Ph D will be accepted into the three departments of the School provided that their previous academic record is of high standard. Prospective candidates should contact the chairman of the appropriate department for further information.

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,

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tissue differentiation and the control of various aspects of growth by growth-regulating substances.

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, biochemical and behavioural genetics of domestic animals.

BOTANY

BOTANY II (75 Lectures)

Syllabus

1. 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 (27 lectures).
2. Aspects of the biochemistry and biophysics of plants (20 lectures).
3. Aspects of the biology of the cryptogams relating to their growth, morphology and reproduction (12 lectures).
4. The ecology of 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. An introduction to angiosperm taxonomy (16 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 four days will form part of the practical course.

Prescribed Reading: Students are advised to consult the student adviser (botany) prior to the beginning of first term as to the most suitable books to purchase.

BOTANY IIA and IIB

Leopold, A. C. *Plant Growth and Development* McGraw-Hill

Edelman, J. and Black, M. *Plant Growth* Heinemann

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

BOTANY IIA

Foster, A. S. and Gifford Jr., E. M. *Comparative Morphology of Vascular Plants* Freeman & Co. 1959

Heywood, V. H. *Plant Taxonomy* Arnold, London 1967

Billings, W. D. *Plants, Man and the Ecosystem* Macmillan, London 1970

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

BOTANY

- Alexopoulos, C. J. *Introductory Mycology* 2nd edn, John Wiley and Sons Inc. 1962
- Briggs, G. E., Hope, A. B., and Robertson, R. N. *Electrolytes and Plant Cells* Blackwells, London
- Price, C. A. *Molecular Approaches to Plant Physiology* McGraw-Hill
- Salisbury, F. B. and Ross, C. *Plant Physiology* Wadsworth Pub. Co. Inc. 1969
- Conn, E. E. and Stumpf, P. K. *Outlines of Biochemistry* John Wiley and Sons Inc., Int. Student Edn 1966

OPTIONAL

- Sporne, K. R. *The Morphology of the Pteridophytes* 2nd edn, Hutchinson University Library 1966
- Willis, J. H. *Ferns, Conifers and Monocotyledons* (A Handbook to Plants in Victoria, vol. 1) 2nd edn, Melbourne Univ. Pr. 1970
- Wakefield, N. A. *Ferns of Victoria and Tasmania* Field Naturalists Club of Victoria 1955
- Slatyer, R. O. *Plant-Water Relationships* Academic Press, London and New York 1967
- Harre, R. *The Method of Science* Wykeham Publications, London 1970
- Daubenmire, R. *Plants and Environment* Wiley, New York 1959

BOTANY III (100 Lectures)

Syllabus

1. ASPECTS OF THE PHYSIOLOGY AND BIOCHEMISTRY OF PLANTS (39 Lectures). Cellular bioenergetics, enzymology and substrate specificity; intermediary metabolism of carbohydrates and lipids in plants; absorption of ions; sulphate and nitrate reduction; photosynthesis and the biosynthesis of various plant products; regulation of protein synthesis and the control of metabolism. Physiology of selected plant processes including autotrophic and heterotrophic nutrition, nitrogen fixation, solute uptake and translocation, ion transport, growth and development, cellular organization.
2. THE ULTRASTRUCTURE AND FUNCTION OF PLANT CELLS (14 Lectures). The content of this course is, in part, complementary to (1) above. The course consists of a survey of current views of the structure of cell membranes, the structure of cellular organelles and their ontogeny and interrelation, as well as a discussion of selected topics relating to the evolution of cellular organelles and cytological aspects of cell differentiation.
3. MORPHOLOGY OF THE SEED PLANTS (15 Lectures). Detailed morphological survey of the families and genera of gymnosperms, their geographic distribution, evolution, reproduction and embryogeny. The treatment of angiosperm morphology will emphasize modes of reproduction — asexual and sexual. Special attention is paid to floral types, inflorescence types, fruits, seeds, embryo sacs and pollen types as well as to the processes of gametogenesis, embryogeny, polyembryony, par-

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thenocarpy, parthenogenesis and apomixis. Evolutionary trends and differences between these two major groups will then be evaluated.

4. **PLANT PATHOLOGY** (12 Lectures). Studies on selected fungal plant pathogens and the relation of their ultrastructure to fungal metabolism. An introduction to the factors affecting host penetration and an analysis of disease 'resistance' in plants with special emphasis on dynamic defence mechanisms initiated after infection. The role of enzymes in pathogenesis and a study of the concept of toxins, growth regulating, and high molecular weight substances involved in symptom expression in the vascular wilts.

5. **PLANT ECOLOGY AND TAXONOMY** (20 Lectures). An advanced course based on the plant ecology section of Botany II.

Prerequisite: Botany II.

Class Requirements: Lectures — four a week for three terms. Practical/tutorial classes — three 3-hour classes a week. A field trip of approximately four days will be part of the practical work.

Prescribed Reading: Students are advised to consult the student adviser (botany) prior to the beginning of first term as to the most suitable books to purchase.

Foster, A. S. and Gifford Jr., E. M. *The Comparative Morphology of Vascular Plants* Freeman and Co. 1959

Wood, R. K. S. *Physiological Plant Pathology* Blackwells, Oxford 1967

Slatyer, R. O. *Plant-Water Relationships* Academic Press, London and New York 1967

Lehninger, A. *Biochemistry* Worth Pub. Co. 1970

Clowes, F. A. L. and Juniper, B. E. *Plant Cells* Blackwells, London 1962

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

Kay, R. H. *Experimental Biology* Chapman and Hall, London 1966

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

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) degrees.

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 postgraduate 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.

CHEMICAL PHYSICS

First Year

Physics I, 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 subjects offered in the School of Physical Sciences.

Second Year

Physics II, 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 203, PM 209, AM 205 (2/3 unit).

This course is also suitable for students intending to major in pure physics. An alternative course which instead would also be suitable for students considering specializing in chemistry is Physics II, Chemistry IIA and Applied Mathematics II.

Third Year

Chemical Physics III is a composite two-unit course comprizing components from Physics IIIA, Chemistry IIIA (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: Electromagnetic Theory (2), Nuclear Physics (2), Statistical Mechanics (2), Solid State (2), Laboratory (4).

Chemistry IIIA: Symmetry and bonding (2), Spectroscopy (2), Mass Spectrometry (1), Diffraction methods (1), Laboratory (3).

Applied Mathematics III: Methods (5), Special Relativity (2), Dynamics (2), Quantum Mechanics (4), Numerical Analysis (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: quantum mechanics, statistical mechanics, scattering theory.

Chemistry IV: molecular electronic structure, advanced spectroscopy, energy dynamics.

CHEMISTRY

POSTGRADUATE STUDIES

Research programs leading to the degrees of MSc or PhD 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

In the School of Physical Sciences, the Department of Chemistry offers courses leading to the BSc (pass) and BSc (honours) degrees. In the academic year 1972, 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 post-graduate 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; jointly in chemistry and biology; jointly in chemistry and philosophy; or jointly in chemistry and economics.

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.

Syllabus

GENERAL AND INORGANIC CHEMISTRY: 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 radio-chemistry.

ORGANIC CHEMISTRY: 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.

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PHYSICAL CHEMISTRY: The physical chemistry of gases, liquids, solids and plasma; properties of dilute solutions, ionic solutions including acids and bases; phase equilibria; reaction kinetics and chemical equilibria; thermochemistry.

PRACTICAL: The course includes experiments related to the inorganic and physical lecture course(s) — the preparation and reactions of inorganic compounds; the preparation, purification, properties and reactions of typical organic compounds.

Class Requirements: Lectures — three a week for three terms. Tutorials — as arranged. Practical — one 3-hour period a week throughout the three terms.

Examinations: Theory — three 1½-hour written papers. Tests on theoretical background to the practical course and the theory will be held throughout the year as required.

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 examination.

Prescribed Books

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

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

Mackay, K. M. and MacKay, R. A. *Introduction to Modern Inorganic Chemistry* Intertext Books, 1969. (This book is prescribed for Chemistry II courses and should be purchased by students proceeding to Chemistry II)

Richards, J. H., Cram, D. J. and Hammond G. S. *Elements of Organic Chemistry* McGraw-Hill 1967

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

Recommended Reading

PRACTICAL COURSE

Gelb, I. R. *Elementary Quantitative Chemistry* Harper and Row 1970

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

Aylward, G. H. and Findlay, T. J. V. *SI Chemical Data* Wiley 1971 (Recommended for students intending to proceed to Chemistry II)

CHEMISTRY IIA

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

Syllabus

INORGANIC CHEMISTRY: General and inorganic chemistry of the non-metallic elements; reactions in non-aqueous solvents; hydrides of Groups

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V and VI; coordination chemistry; nuclear and radio-chemistry; instrumental analysis.

ORGANIC CHEMISTRY: Theoretical and physical organic chemistry; investigation of reaction mechanisms; aromatic substitution reactions; reaction intermediates; carbohydrates, amino acids, proteins, lipids; simple conformational analysis and optical activity.

PHYSICAL CHEMISTRY: Four compulsory and one optional course must be taken.

Compulsory Courses: PC2.01 Spectroscopy, PC2.02 Thermodynamics, PC2.04 Reaction Kinetics, PC2.07 Valency and Molecular Structure.

Optional Courses: PC2.03 Solution Chemistry, PC2.05 Macromolecules and Colloids, PC2.06 Solid State.

Practical: 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 compounds of biological interest and 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 four hours a week.

Examinations: Theory — three 2-hour written papers. Tests on theoretical background to practical course and the theory may be held throughout the year as required. 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 enrolled in the School of Biological Sciences and the School of Agriculture who do not intend to take further courses in chemistry.

Prerequisite: Chemistry I.

Syllabus

INORGANIC CHEMISTRY: 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.

ORGANIC CHEMISTRY: Theoretical and physical organic chemistry; carbohydrates, amino acids, proteins, alkaloids, terpenes, steroids, simple conformational analysis, optical activity; bio-organic mechanisms; natural products, biosynthesis.

PHYSICAL CHEMISTRY: One compulsory (PC2.02) and four optional courses must be taken from the list shown for Chemistry IIA.

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PRACTICAL: 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 compounds of biological interest and 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 — four a week for three terms. 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 — three 2-hour written papers. Tests on the theoretical background to the practical course and the theory will be held throughout the year as required. 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.

Prescribed Books

- Mackay, K. M. and Mackay, R. A. *Introduction to Modern Inorganic Chemistry* Interest Books 1969
- Hendrickson, J. B., Cram, D. J. and Hammond, G. S. *Organic Chemistry* 3rd edn, McGraw-Hill, Int. Student Edn
- March, J. *Advanced Organic Chemistry* McGraw-Hill, Int. Student Edn (For students proceeding to third-year chemistry)
- Brieger, G. A. *A Laboratory Manual for Modern Organic Chemistry* Harper and Row 1969
- Bowen, H. J. M. *Properties of Solids and Their Atomic Structures* McGraw-Hill 1967
- Gray, H. B. *Electrons and Chemical Bonding* Benjamin 1965
- Laidler, K. J. *Reaction Kinetics* vols 1 and 2, Pergamon 1963

Recommended Reading

- Cotton, F. A. and Wilkinson, G. *Advanced Inorganic Chemistry* 2nd edn, Interscience 1966
- Gould, E. S. *Inorganic Reactions and Structure* rev. edn, Holt, Rinehart and Winston 1962
- Duncan, J. F. and Cook, G. B. *Isotopes in Chemistry* Clarendon Press 1968
- Chalmers, R. A., *Aspects of Analytical Chemistry* Oliver and Boyd (Contemporary Science Paperbacks) 1968
- Barrow, G. M. *The Structure of Molecules* Benjamin 1964
- Barrow, G. M. *Physical Chemistry* 2nd edn, McGraw-Hill 1966
- Maron, S. H. and Prutton, C. F. *Principles of Physical Chemistry* 4th edn, Macmillan 1965
- Salzberg, H. W., Morrow, J. I. and Cohen, S. R. *Laboratory Course in Physical Chemistry* Academic 1966

CHEMISTRY

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 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 IIIA

This is a two-unit course intended for the student wishing to major in chemistry; it should also be taken by the student proceeding to the honours degree in chemistry.

Prerequisite: Chemistry IIA.

Syllabus

INORGANIC CHEMISTRY: Systematic inorganic chemistry; chemistry of lanthanons and actinons; general chemistry of the peroxy compounds of transition metals; hydrides with detailed treatment of boron hydrides; interhalogen compounds; poly-halides; experimental techniques in inorganic chemistry including NMR, ESR, Mössbauer, ORD, CD; inorganic stereochemistry and advanced ligand field theory; transition metal complexes with π -bonding; kinetics and mechanisms of reactions of coordination compounds; electro-chemistry; thermochemistry, organo-metallic chemistry; statistics in chemistry; organic reagents in inorganic analysis; instrumental methods of analysis (this course deals with the theory and use of instruments of importance in inorganic and analytical chemistry, e.g. UV-visible spectrophotometry, infrared spectroscopy, atomic absorption spectrophotometry, thermogravimetry, polarography, etc.).

ORGANIC CHEMISTRY: Aspects of organic reaction mechanisms; IR and NMR spectroscopy; synthetic methods; aromaticity and hetero-aromatic compounds; industrial organic chemistry; reactive intermediates and photochemistry; biosynthesis and natural products. A literature review project will also be part of the course.

PHYSICAL CHEMISTRY: Seven units to be chosen from the following:
Optional courses:

- PC 3.01 Symmetry and Molecular Structure I
- PC 3.02 Symmetry and Molecular Structure II
- PC 3.03 Solid State
- PC 3.04 Mass Spectrometry
- PC 3.05 Atomic and Molecular Spectroscopy I
- PC 3.06 Atomic and Molecular Spectroscopy II
- PC 3.07 Reaction Kinetics
- PC 3.08 Surface Chemistry

CHEMISTRY

PC 3.09 Statistical Mechanics I

PC 3.10 Statistical Mechanics II

Students are expected to take a computing course in physical chemistry.

Practical: Advanced inorganic, organic and physical chemistry, including preparations, analytical and special techniques.

Class Requirements: Tutorials/seminars — as arranged.

Examinations: Theory — three 3-hour written papers.

Recommended Reading: See Chemistry IIIB.

CHEMISTRY IIIB

Prerequisite: Chemistry IIA.

This one-unit course is intended for those students who wish to specialize in chemistry jointly with a second subject. It also may be taken by students enrolled in the School of Biological Sciences who require a third-year course in chemistry. Under certain circumstances, the School's Board of Studies may accept Chemistry IIB as a prerequisite.

Syllabus

INORGANIC CHEMISTRY: Systematic inorganic chemistry; chemistry of the lanthanons and actinons; general chemistry of peroxy compounds of transition metals; hydrides; experimental techniques in inorganic chemistry; inorganic stereochemistry and advanced ligand field theory; kinetics and mechanisms of reactions of coordination compounds; electrochemistry; thermochemistry; organic reagents in inorganic analysis; selection of instrumental methods of analysis.

ORGANIC CHEMISTRY: Four courses from those listed for Chemistry IIIA (consult with Professor Topsom).

PHYSICAL CHEMISTRY: Any four courses may be chosen from those listed for Chemistry IIIA (PC 3.01 — PC 3.10).

Practical: Advanced inorganic, and organic and physical chemistry, including preparations, analytical and special techniques. The computing course offered by physical chemistry is optional.

Class Requirements: Lectures — four a week for three terms. Tutorials — as arranged. Practical — a student taking Chemistry IIIB will be required to work regularly in the laboratories for a maximum of 12 hours a week.

Examinations: Theory — three 2-hour written papers.

Tests on the theoretical background to the practical course and the theory will be held throughout the year as required.

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 examination.

CHEMISTRY

Prescribed Books

- Hendrickson, J. B., Cram, D. J. and Hammond, G. S. *Organic Chemistry* 3rd edn, McGraw-Hill, Int. Student Edn.
March, J. *Advanced Organic Chemistry* McGraw-Hill 1969

Recommended Reading

- Cotton, F. A. and Wilkinson, G. *Advanced Inorganic Chemistry* Interscience 1966
Dasent, W. E. *Inorganic Energetics* Penguin 1971
Basolo, F. and Pearson, R. G. *Mechanisms of Inorganic Reactions* Wiley 1967
Kettle, S. F. A. *Coordination Compounds* Nelson 1969
Klotz, I. *Chemical Thermodynamics* Benjamin 1964
Barrow, G. M. *Physical Chemistry* 2nd edn, McGraw-Hill 1966
Maron, S. H. and Prutton, C. F. *Principles of Physical Chemistry* 4th edn, Macmillan 1965
Pratt, G. *Gas Kinetics* Wiley 1969
Barrow, G. M. *Introduction to Molecular Spectroscopy* McGraw-Hill Int. Student Edn
Cotton, F. A. *Chemical Applications of Group Theory* Wiley 1963
Murrell, J. N., Kettle, S. F. A. and Tedder, J. M. *Valence Theory* Wiley 1965
Dixon, R. N. *Spectroscopy and Structure* Methuen 1965
Laidler, K. J. *Reaction Kinetics* vols 1 and 2, Pergamon 1963
Kittell, C. *Thermal Physics* Wiley 1969
McCracken, D. D. *A Guide to Fortran IV Programming* Wiley 1968

Practical Course

- Pecsok, R. L. and Shields, L. D. *Modern Methods of Chemical Analysis* Wiley 1968
Angelici, R. J. *Synthesis and Techniques in Inorganic Chemistry* Saunders 1969

CHEMISTRY COURSES FOR PHYSICAL SCIENCES III

The segments of the chemistry courses which may be taken in Physical Sciences III are: Inorganic Chemistry IIIB, Organic Chemistry III, and Physical Chemistry III.

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

Students should note that completion of sections of the chemistry 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: Chemistry IIIA. Students who have performed well in Chemistry IIIB and another third-year science subject may, in certain circumstances, be admitted to the honours course.

Syllabus: The fourth-year course comprises more advanced study with lectures in all three divisions: physical, inorganic and organic chemistry. All students must take a specified number (up to 10) of units selected from the following list of courses, with the restriction that not less than one or more than six may be taken from those of any one division. Courses must be approved by the head of the division in which the student is undertaking the research project, and those marked with an asterisk (*) are obligatory for students undertaking research in inorganic chemistry. 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*

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, 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 Chemistry*

Electron deficient compounds; metallic carbonyls; carbides, borides, nitrides; tungsten bronzes; polyacids, silicates, silicones, graphite, non-stoichiometry; inorganic polymers.

Modern Techniques in Inorganic Analytical Chemistry

1. Solvent extraction, theory and application.
2. Ion exchange, theory and application.
3. Atomic absorption spectroscopy.
4. Gas chromatography of metal chelates.

Radiation Chemistry

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.

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Stereochemistry and Reaction Mechanisms

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, stereochemically non-rigid (fluxional) molecules; ligand exchange reactions.

Instrumental Techniques in Inorganic Chemistry

1. Thermodynamic techniques:
 - (a) Capsule and titration calorimetry.
2. Spectroscopic techniques:
 - (a) Electron spin resonance, (b) Mössbauer spectroscopy, (c) Nuclear quadrupole resonance spectroscopy.

Transition Metal Catalysis

Factors contributing to the activity of transition metal catalysts. Electron transfer reactions. Catalytic activation of hydrogen and other saturated molecules. Hydrogenation, isomerisation, hydroformulation of olefins and acetylenes. Oligomerisation and polymerisation of olefins. Olefin disproportionation. Activation of carbon-carbon and carbon-hydrogen sigma bonds. Nitrogen fixation. Oxygen transport.

ORGANIC CHEMISTRY

Theoretical Organic Chemistry

The course will introduce modern theoretical calculations on organic molecules with particular reference to their assumptions and the resulting utility and accuracy. The dependence of ground state properties of organic molecules on electron distribution will be reviewed.

Physical Organic Chemistry

The correlation, prediction, and present understanding of certain physical properties, spectra, equilibria and reaction rates of organic molecules will be considered.

Organic Synthesis

The course will deal with recent methods devised for the synthesis of organic compounds. The synthesis of stereochemically strained and naturally occurring compounds will also be discussed.

Organometallic and Organometalloidal Chemistry

The preparation, structures, properties and reactions of all types of organometallic and organometalloidal compounds, including π -complexes, ferrocene and acetylenic compounds. Use of such compounds in organic synthesis and as intermediates in industrial processes.

NMR Spectroscopy

Analysis of spectra. Time-dependent phenomena. Relaxation and Overhauser effects. Double quantum and double resonance phenomena.

Heterocyclic Chemistry

Aspects of the chemistry of pyridine and related compounds, with emphasis on the reactions of pyridinium compounds.

Preparative Organic Electrochemistry

Brief introduction to the theory of electrochemistry followed by a discussion of the various experimental techniques available. Each of the common functional groups in organic chemistry will be considered with respect to its electrooxidation and reduction. The stereochemistry of electrolytic reactions will be summarized.

PHYSICAL AND ANALYTICAL CHEMISTRY

PC 4.01 Advanced Spectroscopy

Radiative transitions, natural linewidths and magnetic resonance relaxation; angular momentum and the electronic spectra of atoms, ions and diatomic molecules; Wigner-Eckart theorem and nuclear quadrupole and electron resonance spectroscopy, Coulomb waves and photoelectron spectroscopy.

PC. 4.02 Group Theory

Elements of group theory, groups, symmetry in molecules, classification of molecules, matrix representation of groups, character table. Applications of group theory in chemistry, molecular vibration, atomic and molecular integrals, selection rules, molecular orbitals, derivation of symmetry adapted orbitals, splitting of degenerate states by crystal field.

PC 4.03 Free Radical Kinetics

Elementary radical reactions in the gas phase, theoretical estimation of rate parameters, kinetic isotope effects.

PC 4.04 Geochemistry

The structure and composition of the earth; geochemical classification of the elements; structure of minerals and clays: the geochemical cycle, the use of analytical and physical methods in the study of minerals; geologic dating, palaeo-temperature and isotope ratio studies.

PC 4.05 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.

PC 4.06 Mass Spectrometry

Types of ions in mass spectra, energetics of ionization-dissociation processes; theory of mass spectra; deduction of molecular structure from mass spectra; high resolution; studies in inorganic chemistry.

PC 4.07 Environmental Chemistry

The impact of agricultural and industrial chemicals on the environment, the nature, ecological effects and control of effluent pollutants; air and water pollution studies; the use of analytical and physical methods in the detection and estimation of pollutants.

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PC 4.08 Energy Dynamics

A qualitative introduction to: molecular energy states, time-dependent and-independent processes; cross sections; photon-electron-molecule, atom and ion-molecule, collision processes; chemical reactions, non-radiative transitions.

PC 4.09 Molecular Electronic Structure

Single particle systems solution of Schroedinger equation for free particle, particle in constant potential wells, hydrogen-like atom; atomic systems, Hartree approximation, Hartree-Fock method, calculations on many-electro atoms; small molecular systems, Born-Oppenheimer approximation, Roothaan equations, ab-initio LCAOMO method; large molecular systems, semi-empirical MO methods, extended Huckel method, CNDO method.

PC 4.10 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.

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.

Class Requirements: 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.

Recommended Reading

INORGANIC AND ANALYTICAL

During each lecture course, the recommended reading is advised by the lecturer concerned.

ORGANIC CHEMISTRY

Prescribed reading to be advised for enrolling students.

PHYSICAL AND ANALYTICAL CHEMISTRY

Prescribed reading to be advised for enrolling students.

POSTGRADUATE STUDIES

The department offers research programs leading to the degrees of M Sc or Ph D. For admission to candidature for 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

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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 MSc and PhD 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 MSc by examination. In certain circumstances, the degrees may be obtained by part-time research study.

Prospective candidates for the MSc or PhD degrees should write in the first instance to the professor of the division concerned or to the chairman, Department of Chemistry, for further information. Excellent facilities are available for research in a wide range of specialist fields:

INORGANIC CHEMISTRY (Professor R. J. Magee)

Spectral and structural studies on metal chelates of transitional metals. Sulphur ligand complexes: metal xanthates, dithiocarbamates, thiocarbamates and related compounds. Electrochemistry: polarographic and chronopotentiometric studies of 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. Preparative and structural studies on metal chelates. 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 stereospecific ligands in four and six-coordinate metal complexes. Studies on 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.

ORGANIC CHEMISTRY (Professor R. D. Topsom)

Physical organic chemistry including effects of steric and electronic factors on the reactivity and properties of aromatic and heteroaromatic compounds; spectroscopic studies on molecular structure of organic compounds; mechanisms of aromatic and heterocyclic reactions; solvent

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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.

PHYSICAL CHEMISTRY (Professor J. D. Morrison)

Self-consistent-field LCAOMO calculations on molecules containing atoms from the second and third rows of the periodic table. The role of 3d-orbitals in bonding. Localized molecular orbitals. Single crystal structural studies by X-ray and neutron diffraction.

Geochemical studies of minerals using standard and flameless atomic absorption, X-ray fluorescence, spectrographic, mass spectrometric and other analytical techniques.

Kinetics of elementary radical reactions in the gas phase. Recombination of small alkyl and substituted alkyl radicals studied by the rotating sector technique; hydrogen abstraction reactions of small radicals and isotope effects in such reactions.

Molecular dynamics and energetics studies by magnetic relaxation behaviour and the photoejection of electrons. Photoelectron energies and angular distributions of small molecules in adsorbed and gaseous phases.

The study of the upper energy states of molecules and the ionization-dissociation processes induced by photon and electron impact in the mass spectrometer.

The application of the computer-controlled GLC mass spectrometer to the study of complex organic mixtures such as odors and flavors. Development of computer programs for ab-initio structure determination from the mass spectra. The design of mass spectrometers.

Isotope ratio measurements of oxygen and sulphur. Paleotemperature studies.

Air and water pollution studies of the Victorian environment.

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For details see the volume of the handbook containing disciplines offered by the School of Social Sciences.

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:

1. Human biology
2. Analytical genetics
3. Population and quantitative genetics
4. Elementary cytogenetics
5. Biochemical genetics
6. Elementary microbial genetics

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 and zoology.

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.

Prescribed Reading

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

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

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

Swanson, C. P., Merz, T. and Young, W. J. *Cytogenetics* Prentice-Hall 1967

Watson, J. D. *Molecular Biology of the Gene* Benjamin 1970

Various references will be recommended during the course.

GENETICS III

An advanced course based on Genetics II as a prerequisite. The course will consist of: microbial, molecular, and developmental genetics (40 lectures); behavioural, ecological, quantitative, and population genetics (40 lectures); radiobiology and related topics (20 lectures).

Prerequisite: Genetics II.

Prescribed Reading

As for Genetics II (except for Harrison *et al*, 1964). Reference books will be recommended during the course.

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

MSc 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. Behaviour genetics in *Drosophila* and mice, and physiological, ecological and quantitative genetics in *Drosophila*.

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2. Biochemical genetics of man, marsupials and *Drosophila*.
3. Immunology of marsupials.
4. Cytogenetic and population genetic studies with Australian native plants, and cytogenetics in 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. Developmental 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 deficient background 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 1972, but it is possible that not all of the above fields will be available in 1972. Intending candidates should consult the chairman of the Department.

GEOLOGY

The Geology Department will offer courses leading to the B Sc (pass) and B Sc (honours) degrees within the School of Physical Sciences. Teaching at the first-year level will begin in 1972 when the number of students will be restricted to about 40. Second and third-year courses will be added in subsequent years. Honours and postgraduate courses will be available as soon as the department is suitably established.

Geology is a study of the planet Earth. It draws heavily on other branches of science, and hence the aim of the new Geology Department is to provide courses that give a fundamental grounding in geology as well as allowing sufficient time in the undergraduate years for the 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.

MATHEMATICS

GEOLOGY I

Prerequisites: Students will normally be expected to have obtained a pass in either chemistry or physics at the higher school certificate or an approved equivalent. No previous knowledge of geology is assumed.

Syllabus

1. *Earth Materials:* Crystals, minerals and rocks of various types; economic mineral deposits; deformation of rocks; faults, folds and other structures.

2. *Earth Processes:* Fossils and the concept of geologic time. Plate tectonics and the formation of mountains.

Class Requirements: Three lectures, and one 3-hour practical period a week for three terms.

Examinations: One 3-hour written paper. Practical tests will be held throughout the year.

Recommended Reading

Gilluly, J., Waters, A. C., and Woodford, A. O. *Principles of Geology* Freeman

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) *Minerals and How to Study Them* Wiley
Black, Rhona *The Elements of Palaeontology* Cambridge Univ. Pr.
Woodford, A. O., *Historical Geology* Freeman

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.

Courses will be given in three disciplines, pure mathematics, applied mathematics, mathematical statistics. Subjects available in 1972 are Mathematics IA, IB and IC, Pure Mathematics II and III, Applied Mathematics II and III, Mathematical Statistics II and III and Mathematics IV.

First-year mathematics subjects do not specialize in any branch of mathematics: each is designed to give the student a broadly-based introduction to mathematical principles, techniques and their applications.

Students enrolled in the School of Physical Sciences, who wish to take a unit in mathematics, are required to take Mathematics IA.

Students intending to take either Pure Mathematics II or Applied Mathematics II should take both Mathematics IA and Mathematics IB. Students who take only Mathematics IA may take some second-year mathematics components as part of Physical Sciences II. Mathematics IC

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is a terminal course and is incompatible with both Mathematics IA and Mathematics IB.

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 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 the subject Mathematics IV. In addition to coursework and examinations in this subject each student must write a thesis, the assessment of which will count toward his final result.

FIRST-YEAR SUBJECTS

Mathematics IA, IB and IC

The subjects offered in first year are Mathematics IA, IB and IC. Students taking IB must take IA concurrently. IC is a terminal course.

Mathematics IA introduces some basic concepts and techniques of mathematics and motivates them by referring to their use in the various sciences.

Mathematics IB consists of two half courses. In one of these the emphasis is on further development of the concepts introduced in IA. In the other the emphasis is on applications, especially to the physical sciences.

Mathematics IC is designed principally to meet the requirements of students in the Schools of Agriculture, Biological Sciences and Social Sciences, although it may prove useful to those seeking a general introductory course in mathematics. Students who have passed the matriculation examinations in pure mathematics and calculus and applied mathematics and who wish to take only one mathematics subject should enrol in Mathematics IA rather than in Mathematics IC.

Students should note that Physical Sciences IT is available to students not in the School of Physical Sciences.

Prerequisites

While there are no formal prerequisites for any first-year mathematics subject, students are warned that the level of subjects in mathematics is determined under the assumption that:

1. each student enrolled for Mathematics IC has passed the matriculation examination in general mathematics;
2. each student enrolled in Mathematics IA has passed the matriculation examination in both pure mathematics and in calculus and applied mathematics.

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Students in the School of Physical Sciences must take Mathematics IA rather than IC. Students who enrol in Mathematics IA with only general mathematics will be required to attend additional tutorials.

Students who have reached only leaving standard in the relevant mathematics subjects are not barred from enrolment but should consult the chairman of the Mathematics Department before enrolling.

Students intending to take second-year mathematics subjects should note: (a) Mathematics IA is normally prerequisite for Mathematical Statistics II; (b) Mathematics IA and IB are both normally prerequisite for Pure Mathematics II and for Applied Mathematics II.

These prerequisites can only be waived by special permission of the chairman of the Mathematics Department.

Students intending to take Mathematical Statistics III should note that it is strongly recommended that they take Pure Mathematics II. Those students are therefore strongly recommended to take Mathematics IB in first year.

Students intending to take Physical Sciences II, who obtain a pass in Mathematics IA only, will be allowed to choose from among the following second-year mathematics components to make up part or all of the requirements for that subject: PM203, PM205, PM208, PM210, AM201, AM202, AM205, ST201, ST202, ST203, ST204, ST205, ST206, ST207.

In special cases prerequisites may be waived by the chairman of the Mathematics Department.

Preliminary Reading

Adler, I. *The New Mathematics* Mentor

Bell, E. T. *Mathematics, Queen and Servant of Science* McGraw-Hill

Kline, M. *Mathematics and the Physical World* Anchor

Smith, J. M. *Mathematical Ideas in Biology* Cambridge University Press

Mathematics IA Syllabus

Logic, sets, functions. Number systems. Vector algebra. Calculus. Differential equations. Matrices and determinants. Probability and statistics.

Mathematics IB Syllabus

Algebraic structures, linear algebra. Analysis. Mathematical models. Particle mechanics. Statics and hydrostatics. Two dimensional rigid body motion. Numerical analysis.

Mathematics IC Syllabus

A survey of mathematical techniques using algebra and calculus and their application to elementary problems in biology and social science.

Ideas and methods of mathematical statistics and the interpretation and design of experimental techniques.

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Class Requirements in Each Subject

A total of five class hours a week (including tutorials). Regular written exercises.

Examination Requirements and Assessment in Each Subject

Two 3-hour written papers. 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 at the second-year level are offered, 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, 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. AM204 is normally a prerequisite for Applied Mathematics III.

Mathematical Statistics II: Components ST201, ST202, ST203 and ST204 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, ST205.

Students should contact the chairman of the Mathematics Department when enrolling in any of the above subjects to discuss their choice of components: advisers will be available within the department to assist in making this choice.

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

For *Pure Mathematics II:* Mathematics IA and IB. For *Applied Mathematics II:* Mathematics IA and IB. For *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 prerequisites may be either a first-year subject or another second-year

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component or both. In particular, a student who has passed Mathematics IA only may take components from the following: PM203, PM205, PM208, PM210, AM201, AM202, AM205, ST201, ST202, ST203, ST204, ST205, ST206, ST207.

In special cases prerequisites may be waived by the chairman of the Mathematics Department.

Students intending to take third-year subjects should consult the prerequisites for those subjects, before choosing their second-year components. Students intending to take Applied Mathematics III must pass PM201, Analysis A. Students intending to take Mathematics Statistics III should take Mathematical Statistics II and are strongly recommended to take Pure Mathematics II also. Students intending to take final honours in mathematics must pass the subject Pure Mathematics II, and should also consult the prerequisite 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 1971. Further prescribed reading in various components may be given during the lectures in these components.

Components Available

The components available for 1972 are listed below: the department may cancel any component in which insufficient interest is shown, or may offer further components. The letters in the code indicates whether the component is 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: PM 202, PM204 and PM205

Term 3: PM206, PM209 and PM210

PM208 is normally given in term 1 and the first 3 weeks of term 2.

PM201 Analysis A (Two Credit Points) (Prerequisite: Mathematics IB)

Fundamental properties of real numbers. Bounds, completeness and convergence. Properties of real valued continuous functions.

PM202 Analysis B (Two Credit Points) (Prerequisite: PM201)

Elementary topological properties in the context of normed vector spaces. Linear maps, continuity and boundedness. Integration in terms of a linear map defined on spaces of functions.

PM203 Linear Algebra (Two Credit Points) (Prerequisite: Mathematics IA)

Vector spaces, subspaces and sum spaces. Linear dependence and independence. Linear transformations and their representations by matrices. Matrix algebra. Normal forms.

PM204 Abstract Algebra A (Two Credit Points) (Prerequisite: Mathematics IB)

Introduction to groups and rings. Homomorphisms, normal subgroups and ideals, homomorphism theorems. Integral domains and fields. Congruences.

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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. Includes some elementary number theory. Finite abelian groups. Field extensions; ruler and compass constructions. Diophantine equations.

PM208 Basic Formal Logic (Four Credit Points) (Prerequisite: Mathematics IA) This component may not be taken with Philosophy IIA.

Introduction to the propositional calculus. Methods of deduction.

PM209 Analysis C (Two Credit Points) (Prerequisite: PM202)

Introduction to convergence in the abstract. Convergence in function spaces. Nets and filters, limit structures. Elementary topology and metric spaces.

PM210 Geometry (Two Credit Points) (Prerequisite: Mathematics IA)

Some simple propositions of ordered geometry, including Sylvester's theorem, are established from axioms, and two developments from ordered geometry, namely affine and absolute geometries, are introduced.

AM201 Ordinary Differential Equations (Four Credit Points) (Prerequisite: Mathematics IA)

Standard methods of integration of differential equations. Theory, methods of solution and applications of linear differential equations. Special functions. Difference equations.

AM202 Vector Analysis (Two Credit Points) (Prerequisite: Mathematics IA)

Geometry of curves and surfaces. Properties of grad, div and curl. Integral theorems. Applications.

AM203 Partial Differential Equations (Two Credit Points) (Prerequisites: Mathematics IB, AM201)

First and second order partial differential equations. Classification. Methods of solution. Fourier series. Equations arising in physical, biological and social sciences.

AM204 Mechanics (Four Credit Points) (Prerequisite: Mathematics IB)

Vectorial mechanics. Analytic mechanics. Lagrange's equations. Small oscillations.

AM205 Numerical Analysis (Two Credit Points) (Prerequisite: Mathematics IA)

Elementary error analysis. Iterative methods. Solution of systems of linear equations and ordinary differential equations. Introductory computer programming: Fortran IV.

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.

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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.

ST203 Correlation and Regression (Two Credit Points) (Prerequisite: ST202)

Continuation of ST202 to consideration of relation between two or more variates.

ST204 Design and Analysis of Experiments (Two Credit Points)

(Prerequisite: ST202)

Experiments involving comparisons of means with homogeneous variance, leading to the analysis of variance.

ST205 Sampling Theory (Two Credit Points) (Odd Numbered Years Only)

(Prerequisite: Mathematics IA)

Methods of analysis of surveys; simple random sampling; cluster sampling; stratified sampling.

ST206 Stochastic Processes (Three Credit Points) (Prerequisite: Mathematics IA)

Generating functions and applications. Random walks. Markov chains in discrete and continuous time.

ST207 Mathematical Genetics (Two Credit Points) (Prerequisite: Mathematics IA)

Application of mathematical models to Mendelian inheritance.

Class Requirements: Lectures — about nine for each credit point. 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 in some components. The final result will take into account exercises and tests held throughout the year.

THIRD-YEAR SUBJECTS

Pure Mathematics III, Applied Mathematics III, Mathematical Statistics III.

Three mathematics subjects at the third-year level are offered, namely Pure Mathematics III, Applied Mathematics III and Mathematical Statistics 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 will be possible in certain cases for students to select a small number of second-year components instead of third-year components.

Students should contact the chairman of the Mathematics Department when enrolling in any of the above subjects to discuss their choice of components: advisers will be available within the Department to assist in making this choice.

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A student must take at least 12 credit points from the subjects in which he is enrolled, and may make up the remainder from any mathematics subjects: in addition to this restriction, AM301 and AM302 are compulsory for Applied Mathematics III and ST301 and ST302 are compulsory for Mathematical Statistics III.

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

For Pure Mathematics III: Pure Mathematics II, including PM202.

For Applied Mathematics III: Applied Mathematics II (normally including AM204), and PM201.

For Mathematical Statistics III: Mathematical Statistics II. In addition Pure Mathematics II is strongly recommended.

Note: Each component has its own prerequisite; in special cases prerequisites may be waived by the chairman of the 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 1971. Further prescribed reading in various components may be given during the lectures in these components.

COMPONENTS AVAILABLE

The components for 1972 are listed below: the department reserves the right to cancel any component in which insufficient interest is shown, or may offer further components. The letters in the code indicates whether the component is pure mathematics (PM), applied mathematics (AM), or mathematical statistics (ST).

PM301 Linear Algebra (Two Credit Points) (Prerequisite: PM203)

Inner-product spaces. Self-adjoint and normal operators, eigenvalues and eigenvectors. Projections and the spectral theorem. Completely continuous operators.

PM302 Measure Theory (Three Credit Points) (Prerequisite: PM305)

General measures on σ -algebras. Measurable functions. Integration. Applications to L_p spaces. Product spaces. Convergence.

PM303 Advanced Calculus A (Two Credit Points) (Prerequisite: PM202)

Mappings of Euclidean space, derivatives as linear maps, inverse mapping theorems.

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PM304 Advanced Calculus B (Two Credit Points) (Prerequisites: PM303 and PM305)

Multilinear algebra. Differential forms. Integration over chains. Fundamental theorem of calculus. Applications to complex calculus.

PM305 Topology (Two Credit Points) (Prerequisite: PM202)

Metric spaces, limits and continuity, completeness. Topological spaces. A discussion of general topological properties.

PM306 Group Theory (Two Credit Points) (Prerequisite: PM206)

Direct sums and products of groups. Sylow theorems. Free groups. Permutation groups.

PM307 Rings and Modules (Three Credit Points) (Prerequisite: PM206)

Principal ideal domains, unique factorization domains, Euclidean domains. Modules and their endomorphism rings. Modules over a principal ideal domain.

PM308 Fourier Series (Three Credit Points) (Prerequisites: PM302, PM305)

Theory and techniques of Fourier series, introduction to some related parts of functional analysis.

PM309 Field Theory (Two Credit Points) (Prerequisite: PM206) (This component will not be given in 1972).

Field extensions, leading to Galois theory.

PM310 Lattice Theory (Two Credit Points) (Prerequisite: PM305)

Posets and lattices. Distributive lattices. Ideal and representation theory. Spaces of prime and minimal prime ideals. Stone lattices.

PM312 Formal Logic (Six Credit Points) (Prerequisite: PM208 or Philosophy IIA) (This component may not be taken with Philosophy IIIB)

Detailed discussion of the propositional and predicate calculi, including proof theory, model theory and metatheory.

PM313 Number Theory (Two Credit Points) (Prerequisite: PM206)

Topics to be selected from: Fermat's theorem. Fermat's last 'Theorem' and related results. Representation of numbers as sums of primes, squares, cubes. Algebraic numbers and algebraic integers. Polynomial congruences. Number theoretic functions. Results involving $\pi(x)$. Riemann zeta function.

PM314 Function of a Complex Variable (Two Credit Points) (Prerequisite: For 1972, PM209; after 1972, PM305)

Cauchy's integral theorem, and other important related results on functions of a complex variable.

PM315 Nonlinear Programming (Two Credit Points) (Prerequisite: PM205)

Quadratic and convex programming. Duality. Computational techniques.

AM301 Methods of Applied Mathematics (Five Credit Points) (Prerequisites: AM210, AM203, PM201)

Boundary value problems. Eigenvalue problems. Basic concepts of Hilbert space. Calculus of variations. Special functions. Green's functions. Integral transforms. Integral equations.

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AM302 Potential Theory (Five Credit Points) (Prerequisites: AM202, AM203, PM201)

Solutions of Laplace's equation, including conformal mapping techniques with applications. Irrotational fluid mechanics. Electrostatics and magnetostatics.

AM303 Special Relativity Theory (Two Credit Points) (Prerequisites: Mathematics IB and AM204)

Lorentz transformation. Minkowski space-time, particle kinematics and ray optics, mechanics of a particle, Maxwell field.

AM304 Three-dimensional Dynamics (Two Credit Points) (Prerequisites: AM201, AM204)

Rotating co-ordinate systems. Rigid body motion. Variational principles. Small vibrations.

AM305 Introduction to Quantum Mechanics (Four Credit Points) (Prerequisites: AM204, AM301)

Hamiltonian systems. Operators, wave functions and wave equations. Angular momentum. Perturbation theory. Scattering.

AM306 Electromagnetic Theory (Two Credit Points) (Prerequisites: AM301, AM302, AM303)

Steady fields and currents. Maxwell's equations. Plane waves. Radiation.

AM307 Elasticity (Two Credit Points) (Prerequisites: AM202, AM203, PM201)

Stress and strain quadrics. Compatibility conditions. Navier equation in isotropic media and boundary value problems.

AM308 Numerical Analysis (Two Credit Points) (Prerequisites: AM205, PM201, PM203)

Calculation of eigenvalues and eigenvectors of symmetric matrices. Matrix norms. Perturbation theory. Error analysis. Iterative methods. Approximation of functions. Solution of partial differential equations.

AM309 Introduction to Computer Science (Two Credit Points) (Prerequisites: AM205 provides useful background but is not essential)

Computer hardware. Boolean algebra. Computer logic and arithmetic storage. Machine languages. Compilers and supervisors.

ST301 Techniques of Mathematical Statistics (Four Credit Points) (Prerequisite: ST201)

Transformations in one and many dimensions, derivation and sampling distributions for t and F ; characteristic functions, inversion, continuity and uniqueness theorems; the multivariate normal distribution, order statistics and the elements of non-parametric methods.

ST302 Inference (Four Credit Points) (Prerequisite: ST301, ST202)

Estimation, concepts of sufficiency and maximum likelihood, confidence intervals, hypothesis testing; the Neyman-Pearson lemma, asymptotic methods, Bayes methods.

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ST303 Linear Hypothesis Theory (Four Credit Points) (Prerequisites: ST203, ST204; ST301, ST302)

A general treatment, using matrices and the multivariate normal distribution, of problems of estimation and hypothesis testing with linear models.

ST305 Stochastic Processes (Four Credit Points) (Prerequisite: ST201)

Waiting times, 0-1 laws, recurrent events, Markov chains, simple time-dependent stochastic processes.

ST306 Sampling Theory (Two Credit Points) (Odd numbered years only — this component is identical to ST205)

Methods of analysis of surveys; simple random sampling; cluster sampling, stratified sampling.

ST307 Mathematical Genetics (Two Credit Points) (Prerequisite: ST207)

Deterministic and stochastic problems in population genetics, including the probability of survival of a mutant, linkage, stationarity in two-locus systems; biometric problems, in particular problems of classification and discrimination with multivariate observations.

ST308 Non Parametric Methods (Two Credit Points) (Prerequisite: ST301)

Order statistics, sample distribution function, Glivenko-Cantelli theorem, Kolmogorov's statistic and tests, Wilcoxon's statistics and test. Sign test, run test. Non-parametric confidence intervals.

ST309 Sequential Analysis (Two Credit Points) (Prerequisites: ST301, ST302)

Wald's lemma and identity; the sequential probability ratio test and its properties. Other sequential procedures. Sequential estimation and fixed-width confidence intervals.

ST311 Operations Research (Three Credit Points) (Prerequisite: ST202)

Optimisation 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.

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 in some components. The final result will take into account exercises and tests held throughout the year.

MATHEMATICS IV — HONOURS COURSES

A student wishing to enrol in the subject Mathematics IV should apply to the chairman of the Department of Mathematics as soon as the results of his third-year examinations are known, and if his enrolment is accepted will select his choice of components in conjunction with the

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chairman. Each student will be expected to take five components. 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.

Students whose main interest is in pure mathematics should normally have a grade of B or better in Pure Mathematics III. They are also advised to take more than 18 credit points of pure mathematics in third year. Applied mathematics, mathematical statistics and philosophy are recommended as suitable complementary third-year subjects: however other choices are possible.

Students whose main interest is in applied mathematics should normally have a grade of B or better in Applied Mathematics III. Pure mathematics, mathematical statistics and physics are recommended as suitable complementary subjects at third-year level.

Students whose main interest is in mathematical statistics should normally have a grade B or better in Mathematical Statistics III. They are also strongly advised to take Pure Mathematics III, including the component PM302.

Students wishing to combine components from two or more divisions in Mathematics may select components, for which they have the appropriate prerequisites, subject to the approval of the chairman.

The components offered in pure mathematics and applied mathematics are listed below: the department reserves the right to withdraw any component in which insufficient interest is shown, or to offer further components. Fourth-year students wishing to take mathematical statistics components should arrange their courses in consultation with staff members of the statistics division. With the permission of the mathematics and physics departments fourth-year students may take some components in physics.

In special cases prerequisites may be waived by the chairman of the Mathematics Department.

PM401 Group Theory (Prerequisite: PM306)

Solubility and other chain properties. Representations. Group extensions. Formations.

PM402 Differentiable Manifolds (Prerequisites: PM303, PM305)

Selected topics from differential topology and differential geometry.

PM403 Noncommutative Rings (Prerequisite: PM307)

Selected topics from the theory of Noncommutative Rings.

PM404 Advanced Topics in Nonlinear Programming (Prerequisite: PM315)

Symmetric and Self Duality. Integer and Geometric Programming. Computational Techniques. Programming in Complex Space.

PM405 Functional Analysis (Prerequisites: PM305, PM308)

Locally convex topological vector spaces and the Hahn-Banach theorem. Fixed point theorems. Duality. The Banach-Steinhaus, closed graph, and open mapping theorems. Applications to integration, distributions. Differential and integral equations. Fourier series and transforms.

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PM406 Topics in Algebraic Topology (Prerequisite: PM306)

Simplexes. Simplicial complexes. Invariance of the homology groups. Homotopy theory.

PM407 Advanced Topics in Complex Analysis (Prerequisite: PM314)

Topics in conformal mapping, Riemann mapping theorem, harmonic functions, Dirichlet problem.

PM408 Game Theory (Prerequisite: PM205)

Two-person non-zero sum games, n -person games, infinite games.

PM409 Lattice Groups (Prerequisite: PM310)

Lattice groups and vector lattices, prime and minimal-prime ideals. Values. Representation theory.

PM410 Information Theory (Prerequisite: PM302)

Measure-preserving transformations, ergodic theorems. Entropy and coding theorems.

PM411 Mathematical logic (Prerequisite: PM312 or Philosophy IIIB)

Completeness results for classical first-order quantificational logic, formal number theory, recursive functions, philosophy of mathematics.

AM401 Mathematical Methods (Prerequisite: AM301)

Topics selected from: generalized functions. Asymptotic methods. Integral transforms. Integral equations. Applications of functional analysis. Special functions. Lie groups.

AM402 Continuum Mechanics (Prerequisites: AM301, AM302)

Motion of viscous fluids, hydrodynamic stability, elasticity.

AM403 General Relativity (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 (Prerequisites: AM301, AM304)

Hamiltonian systems, global dynamics, transformation theory, stability and perturbation theory.

AM405 Quantum Mechanics (Prerequisites: AM301, AM303, AM305)

Advanced quantum mechanics, relativistic particle equations, introduction to quantum field theory and quantum electrodynamics.

AM406 Electromagnetism (Prerequisites: AM301, AM302, AM303, AM306)

Maxwell's equations; polarization; wave guides; radiation from point charge.

AM407 Astrophysics (Prerequisites: AM301, AM302)

Simple stellar models. Small oscillations. Stability.

AM308 Numerical Analysis (Prerequisites: AM301, AM308)

Projection methods. Iterative methods. Order of convergence. Error analysis. Application of elementary functional analysis to numerical analysis.

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AM409 Statistical Mechanics (Prerequisites: AM301, AM305)

Maxwell-Boltzmann statistics, ideal gas, quantum statistics, thermodynamics, specific heats.

ST401. Probability Theory (Prerequisite: PM302)

Probability theory as a part of measure theory. Standard theorems and techniques.

ST402 Probability Theory II

Continuation of ST401 to more specialized topics.

ST403 Inference

Advanced estimation theory and hypothesis testing.

ST404 Multivariate Analysis

Estimation and hypothesis testing with the multivariate normal distribution. Generalized analysis of variance.

ST405 Time Series

Introduction to spectral theory; estimation and hypothesis testing in time series.

ST406 Operations Research

Advanced topics in inventory, optimization procedures, game theory, network and flow theory.

ST407 Stochastic Processes

Markov processes, diffusion processes, branching processes, renewal theory.

ST408 Game and Decision Theory

An introduction to decision theory and its relation to game theory.

ST409 Distribution Theory

The algebra of distribution functions. Infinitely divisible, stable and associated laws.

ST410 Sequential Analysis

Theoretical approach to sequential analysis using stopping rules.

ST411 Non-parametric Analysis

Inference with unknown distributions; distribution free tests, theory of rank tests.

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 Mathematics Department; research interests of members of the department comprise abstract algebra, including group theory and ring theory, mathematical programming, functional analysis, topology, approximation theory, differential equations, numerical methods, computing, astrophysics, continuum

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mechanics, quantum mechanics, relativity, electrostatics, probability theory, stochastic processes, population genetics, mathematical ecology, regression, mathematical epidemiology.

PHILOSOPHY

For details see the volume 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. Another such course, a combination of mathematics and astronomy, may be available in 1972. (Intending students should discuss with advisers of studies.)

Prerequisites

Although a knowledge of physics and mathematics to higher 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* vol. I and II, Horwitz and Graham

Physical Sciences Study Committee *Physics* D. C. Heath & 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.

These courses to be taken from existing IA and IC courses depending on the students' background prior to university entrance.

Physics Component (32 lectures plus one term laboratory)

PHIIO ENVIRONMENTAL PHYSICS (24 lectures)

The states of matter, solids, liquids gases. Stress and strain, elasticity. Hydrostatics, fluid dynamics, viscosity, Stokes Law, and terminal velocity. Electromagnetic spectrum, Kirchoff's Stefan-Boltzmann and Wien's Laws,

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Planck's distribution and quantum theory of radiation. The solar spectrum and solar constant. Radiation observed at the ground. Temperature, pressure, gas laws, heat and work laws of thermodynamics. Thermodynamics. Thermal stresses. Heat conduction and convection. Physical environment of the biosphere. Energy balance at a surface e.g. earth, animal or plant. Modern physics. Radioactivity, x-rays, elementary particles, nuclear physics.

ELECTRICAL CIRCUIT THEORY (8 lectures)

D.C. Circuits: Resistances in series and parallel; Kirchoff and Thevenin theorems.

A.C. Circuits: Sinusoidal voltage and current. Resistive load, instantaneous power, average power, differential properties of R, L & C, Phasor concept. L, LC, LRC circuits, and associated properties. 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.

Examination Requirements

Two 3-hour written papers, or equivalent.

PHYSICAL SCIENCES II and III

The composite subjects Physical Sciences II and Physical Sciences III are available in addition to the separate subjects already offered in the School of Physical Sciences. Students will be able to select approved segments from existing subjects in the second and third years of their studies. The approved segments may be selected from those subjects offered in the School of Physical Sciences which lie outside the two subjects, in the second year, and one subject in the third year in which the student is majoring. The work value of the segments together must total at least that required in an existing subject.

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.

MATHEMATICS

A student who has passed in Mathematics IA and IB may take any second-year mathematics component, while a student who has passed in

PHYSICAL SCIENCES

Mathematics IA only, may take components from the following: PM201, PM203, PM205, PM208, PM210, AM202, AM205, and any statistics components from ST201 to ST207. Advice on the choice of components may be obtained from the chairman of the Department of Mathematics.

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 Dr J. D. Riley.

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 eighteen credit points.

CHEMISTRY

Inorganic Chemistry IIIB, Organic Chemistry III, and Physical Chemistry III. Each may be chosen singly or in combination provided that chemistry is not being taken as a major subject at the third-year level. The prerequisite for each is the appropriate course from Chemistry IIA or, in special cases IIB and each has a work value of six credit points.

Students should note that the completion of sections of the chemistry courses in Physical Sciences III does not qualify them for admission to the honours school of chemistry. However, in every case, intending honours students should make application to the Head of the appropriate division of chemistry.

MATHEMATICS

Students may choose those components of Pure Mathematics III, Applied Mathematics III and Mathematical Statistics III for which they have the prerequisites listed under these subjects in this handbook. Advice on the choice of components may be obtained from the chairman of the Department of Mathematics.

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).

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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 Dr J. D. Riley.

PHYSICS

In the academic year 1972 the Physics Department will offer the following courses: Physics I, Physics II, Physics IIIA, Physics IIIB and Physics IV, together with service courses in physics.

Courses I, II, IIIA and IV are intended to provide a continuous thorough and balanced training in physics, and together with other subjects offered in and required by the School, will serve as a suitable training for teachers of physics, for industrial appointments in physics or as an introduction to postgraduate studies at this and other institutions.

The service courses in physics are intended for students not majoring in the subject. One of these subjects is Physical Sciences IT, of which physics constitutes about half the work. Further service courses may be announced before the commencement of 1972.

PHYSICS I

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.

Syllabus

PH101 Electrical Circuit Theory

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 Mathematical Introduction

Differential and integral calculus (physicist's viewpoint). Vector algebra. Complex numbers. Errors. Distributions. Physical quantities and dimensions. Linear differential equations. Kinematics.

PH103 Wave and Field Propagation

General wave phenomena and their inter-relationships. Superposition of waves (interference, diffraction) and its applications to mechanical, sound and electromagnetic waves. Geometrical optics.

PHYSICS

PH104 Electricity and Magnetism

Coulomb's law; Lorentz force relation; electron motion in uniform electric and magnetic fields; Law of Biot and Savart; Ampère's law; Gauss's law; calculation of simple electric and magnetic field configurations; dielectrics; capacitance; induction effects.

PH105 Mechanics and Special Relativity

Accelerated frames. Energy. Gravitation. Simple harmonic motion. Rotational kinematics and dynamics. Special relativity theory. Lorentz-Fitzgerald contraction. Time dilation. Variation of mass with velocity. Energy. Photons.

PH106 Modern Physics

Brief historical introduction. De Broglie relationship. 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).

PH107 Nuclear Physics

Objectives; hierarchy of forces; nomenclature and units; nuclear radius; nuclear mass and binding energy; stability considerations and decay processes; energy level diagrams; angular momentum and parity.

PH151, PH152, PH153

A three-term introductory course in electronic measurement techniques.

Class Requirements: Lectures — three a week for three terms. Tutorials — optional tutorials may be offered to all first-year students in 1972. Laboratory — four hours a week for three terms. Attendance at laboratory classes is normally compulsory.

Examination Requirements: Each unit course, as outlined above, will be examined either at the end of term or at the end of the year as appropriate. The laboratory work of each student is assessed continually throughout the year and together with tutorial assessment is taken into account in determining the overall performance of the student.

Preliminary Reading

Physical Science Study Committee *Physics* 2nd rev. edn, Heath 1965

OR

Stollberg, R. and Hill, F. F. *Physics: Fundamentals and Frontiers* Arnold 1966

Prescribed Reading

EITHER

Alonso M. and Finn, E. J. *Physics* Addison-Wesley 1970

OR

Beuche, F. *Introduction to Physics for Scientists and Engineers* McGraw-Hill, should be purchased for use as a general text.

PHYSICS

PHYSICS II

Prerequisites: Students enrolling in any portion of this subject will normally be expected to have completed the Physics I course and either Mathematics IA or Mathematics IB.

Syllabus (18 credit points constitute Physics II.)

PH201 Physical Electronics (One Credit Point)

Conduction in solids; intrinsic and extrinsic semi-conductors; pn 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; systems of particles. Conservative systems. Hamiltonian function and Hamilton's equation. Poisson bracket. Rigid-body dynamics: Inertia tensor, Eulerian angles. Lorentz transformation. Simultaneity and time sequence. 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. Schroedinger equation. Barrier-well problems. Harmonic oscillator. Average values in Q.M. Legendre, Laguerre 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-

PHYSICS

Stokes equation for viscous incompressible flow. Poiseuille's law. Stoke's formula.

PH251, PH252, PH253, PH254, PH255, PH256: Associated laboratory courses. Credit for these is included in the above theory courses.

Class Requirements: Lectures — four a week for three terms. Laboratory — four hours a week for three terms (normally compulsory).

Examination Requirements: Each unit course as outlined above will be examined either at the end of term or 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 determining the overall performance of the student.

Preliminary Reading: See prescribed reading for Physics I.

Prescribed Reading

Lorrain and Corson *Electromagnetic Fields and Waves* 2nd edn, Freeman 1970

Leighton, R. B. *Principles of Modern Physics* McGraw-Hill Paperback 1959

Kittel, C. *Introduction to Solid State Physics* 3rd edn, Wiley

Kittel, C. *Thermal Physics* Wiley

Millman and Halkias *Electronic Devices and Circuits* McGraw-Hill 1967

Landau and Lifshitz, *Mechanics* Addison Wesley 1960

PHYSICAL SCIENCES II

Students may select various second-year physics units combined with units from chemistry and mathematics to make up Physical Sciences II. These units may be chosen in one of the following ways:

1. Four credit points from PH201 to PH209 together with two laboratory courses.
2. Six credit points from PH201 to PH209 together with three laboratory courses.
3. Eight credit points from PH201 to PH209 together with four laboratory courses.

Students wishing to enrol in this subject for 1972 must discuss their proposed combination with Dr J. D. Riley. The course may be taken in conjunction with any other level III course in the School of Physical Sciences for which the prerequisites have been satisfied.

PHYSICS IIIA

Students interested in a more mathematical approach at third-year level should consider enrolling in Physical Sciences III (see below).

Prerequisites. A student enrolling in this subject will be expected to have completed the Physics II course and one of the second-year courses in mathematics.

Syllabus: (18 credit points constitutes Physics IIIA.)

PHYSICS

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, matter. Retarded and Hertz polarization potentials. Poynting's theorem. Applications of Maxwell's equations: transmission lines, wave guides, cavities and aerials, 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-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.

PH308 Atomic Physics and Spectroscopy (Two Credit Points)

Vector model of the atom, spectral states. Perturbation theory. Selection rules. Atoms in magnetic fields. Complex spectra. Introduction to molecular spectra.

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 designed for students already taking Physics IIIA who intend to terminate in physics at the end of third year. It is advised that students intending to go on to Physics IV do not take Physics

PHYSICS

IIIB, but rather take mathematics courses instead. Further details may be obtained from Dr J. D. Riley, adviser of studies in physics.

PHYSICAL SCIENCES III

Students enrolled in this subject may select various physics units combined with units from chemistry and mathematics to make up Physical Sciences III (a total of 18 credit points must be obtained).

The following combinations are allowed:

1. Two credit points from PH301 to PH308. One laboratory credit unit.
2. Four credit points from PH301 to PH308. Two laboratory credit points.
3. Six credit points from PH301 to PH308. Four laboratory credit points.

Students wishing to enrol in this subject for 1972 must discuss their proposed combination with Dr J. D. Riley.

PHYSICS IV

Prerequisites: A student enrolling in this subject will be expected to have completed the Physics IIIA course. Admission to this course may be restricted in 1972.

Syllabus

PH401: Mathematical Physics and Statistical Mechanics (Two Credit Points)

Use of Green's Functions in the Many-Body Problem. Feynman Diagrams. Quasi-particles. Dyson's equation approximations. Applications to superconductivity, electron gas in metals, superfluids. Liquid state.

PH402 Elementary Particle Physics (One Credit Point)

Interactions. The particles (graviton, photon, neutrinos, muons, pions, other mesons, hyperons, baryon resonances, meson resonances, anti-particles). Classifications.

PH403 Nuclear Physics (One Credit Point)

Nuclear reactions. The compound nucleus. Resonant reactions. Optical model. Direct reactions, Isobaric analog states.

PH404 Quantum Mechanics (Two 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 General Relativity (Two Credit Points)

Tensors. Einstein's gravitational equations. Schwarzschild space-time. Three tests of gravitation theory.

PH407 Special Relativity (One Credit Point)

A detailed look at the application of the special theory to one branch of physics.

PHYSICS

PH408 Scattering Theory (One Credit Point)

Classical theory of scattering, and the conditions of validity. Differential and total collision cross-sections. Quantum theory of scattering; particle wave analysis; phase-shift calculations; scattering by central field; the Born approximation.

PH409 Plasma Physics (One Credit Point)

Motion of charged particles in force fields. Macroscopic motion of plasma in force fields. Waves in a plasma.

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.

Class Requirements: Lectures — eight a week till completed. Laboratory — 16 hours a week for two terms.

Projects of a theoretical nature may be arranged by consultation with staff members and Professor Cole. Other assignments may be given from time to time throughout the year.

Examination Requirements: Up to eight 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. Other assignments given during the year may also be used in assessing the student's progress.

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 degrees of M Sc or Ph D.

Division of Electron Physics (Professor D. E. Davies)

Ionization phenomena in pure gases with particular reference to a study of the plasma/surface interface. Solid state collision phenomena studies by means of electron, photon and ion induced electron emission. Photoelectron spectroscopy. Electron spin resonance, nuclear spin resonance and laser interferometry of solid surfaces.

Division of 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 related to the properties of the ionosphere and magnetosphere using radio and optical techniques. Auroral physics. Solar-terrestrial relations.

The division of space physics operates a field station in Kilmore Shire and encourages collaborative projects with outside agencies.

PSYCHOLOGY

Mr R. B. Montgomery

The course is concerned with the study of motivation, with particular emphasis on love and aggression. The study of these two themes will be used to introduce the student to the areas of biological bases of behaviour, development, drive and emotion, learning and memory, sensory-motor integration, and abnormal and social behaviour. There will also be a component of the course concerned with experimental procedure, the techniques for collection and analysis of data, and questions of interpretation of data.

Prerequisites: The prerequisites for students enrolling for the B Sc degree are passes in the Victorian higher schools certificate examination or an approved equivalent in chemistry and any one subject from biology, physics or a branch of mathematics. There are no prerequisites for students enrolling for the Bachelor of Arts degree.

Class Requirements: Two 1-hour lectures and one 3-hour laboratory class a week.

Examination: Assessment will be by written laboratory reports and essays, and by objective tests at the end of each term.

Preliminary Reading

Broadhurst, P. L. *The Science of Animal Behaviour* Penguin 1963

Morris, D. *The Naked Ape* Baylis 1967

Prescribed Reading

Harlow, H. F., McGaugh, J. L. and Thompson, R. F. *Psychology* Albion 1971

Townsend, J. C. *Introduction to Experimental Method* McGraw-Hill 1953

ZOOLOGY**SECOND AND THIRD-YEAR COURSES**

The courses Zoology O and Zoology P are separate and equivalent units founded on Biology IB, and neither course requires a previous knowledge of the other. One or both courses may be taken in a student's final two years; students who intend to become professional zoologists should take both courses.

Third-year students are required to take the course Zoology S in addition to Zoology O or Zoology P. Third-year students are also required to attend a four-day field excursion.

ZOOLOGY IIO OR IIIO (The Animal Organism)

The theme of this course of 75 lectures and associated practicals/tutorials is the way the individual animal functions as a living system. Subjects of study include cellular structure and membrane biology;

ZOOLOGY

reproductive biology, development and growth; the general and comparative physiology of animals; insect physiology; endocrinology; the activity, perception and behaviour of animals; ecological physiology.

Prerequisites: Biology IB and Chemistry I.

Class Requirements: Three lectures and two 3-hour practical/tutorial classes a week for three terms.

Prescribed Reading: Students should consult the zoology student adviser at the time of enrolment for the course.

ZOOLOGY IIP OR IIIP (Animal Populations)

In this course of 75 lectures and associated practicals/tutorials, animals will be studied at the population level, with emphasis on the environmental and evolutionary aspects of population biology. Subjects of study include population dynamics and population ecology; social behaviour; the evolution of populations, species formation and species structure; community ecology and species interactions; zoogeography; conservation and applied ecology.

Prerequisites: Biology IB and either Mathematics IA or Mathematics IC. Biology IA is desirable.

Class Requirements: Three lectures and two 3-hour practical/tutorial classes a week for three terms.

Prescribed Reading

Erlich, P. R. and Erlich, A. H. *Population; Resources; Environment Issues in Human Ecology* W. H. Freeman

MacArthur, R., Connell, J. *The Biology of Populations* Wiley

Tinbergen, N. *Social Behaviour in Animals* Methuen

Andrewartha, H. G. *Introduction to the Study of Animal Populations* (soft cover) 2nd edn, Methuen

Solomon, Maurice E. *Population Dynamics* (The Institute of Biology's Studies in Biology No. 18) Edward Arnold

Recommended Reading

Hardin, G. *Science, Conflict and Society* W. H. Freeman

Scientific American *The Biosphere* W. H. Freeman

Background Reading

Odum, E. P. *Fundamentals of Ecology* Saunders

Allee, Emerson, Park, Park, Schmidt *Principles of Animal Ecology* Saunders

Macfadyen, A. *Animal Ecology: Aims and Methods* Pitman

Andrewartha, H. G. and Birch *The Distribution and Abundance of Animals* Chicago Univ. Pr.

Southwood, T. R. E. *Ecological Methods*, Methuen

ZOOLOGY

- Phillipson, J. *Ecological Energetics* Arnold
Wynne-Edwards, V. C. *Animal Dispersion in Relation to Social Behaviour*
Oliver and Boyd
Lack, D. *Population Studies of Birds* Clarendon Press, Oxford
Lack, D. *The Natural Regulation of Animal Numbers* Clarendon Press,
Oxford
Cox, G. W. *Readings in Conservation Ecology* Appleton-Century-Crofts
Dasmann, R. F. *Wildlife Biology* John Wiley
Hardin, G. *Population, Evolution, Birth Control. A College of Controversial readings.* (Plus supplement — Hardin, G. 'Science Controversy — A Case Study') W. H. Freeman
Johnson, C. E. *Eco-Crisis* John Wiley
Strahler, A. E. *An Introduction to Physical Geography* Wiley International
Edn
Weatherley, A. H. *Australian Inland Waters and their Fauna* ANU Press,
Canberra

ZOOLOGY IIIS

A course of 25 lectures on insects and terrestrial vertebrates, to be taken by third-year students only.

Prerequisites: Zoology O or Zoology P.

Class Requirements: One lecture and one 3-hour practical/tutorial class a week for three terms.

Prescribed Reading

- Romer, A. S. *The Vertebrate Body*, 3rd edn, Saunders
Ross, H. *A Textbook of Entomology* (soft cover) Int. Edn, Wiley

Recommended Reading

- Goin, G. J. and O. B. Goin *Introduction to Herpetology* W. H. Freeman
Chapman, R. F. *The Insects, Structure and Function* The English University Press
Norris, K. R. *Methods of Collection and Preservation of Insects* Australian Entomological Soc.

Background Reading

- CSIRO *The Insects of Australia* Melbourne University Press
Imms, A. D. *A General Textbook of Entomology* Methuen
Wigglesworth, V. B. *The Life of Insects* Weidenfeld & Nicholson
Oldroyd, H. *Collection, Preservation and Studying Insects* Hurchinson

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.

ZOOLOGY

POSTGRADUATE STUDIES — MSc and PhD

Research is currently in progress in the following fields: speciation on oceanic archipelagos; zoogeography of Pacific insects; zoogeography, conservation, physiological ecology and evolution of SE Australian reptiles; ecology, taxonomy and morphology of insects; population ecology of plant-feeding insects, particularly agricultural pest species; biological, chemical, and integrated control of insect pests; physiological and ultra-structural studies of insect excretion, salt and water regulation, sensory receptors; endocrine control of salt and water metabolism in vertebrates; reproductive biology of dasyurid marsupials.

Prospective students should contact the chairman of the department for further details.

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
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 Biological and Physical Sciences

SUBJECT	CODE No.	UNIT VALUE	PREREQUISITE SUBJECTS
Biochemistry II	574.24	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	Nil
Biology IB (zoology and genetics)	570.11	1	Nil
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
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	2	Chemistry IIA (incompatible subject Chemistry IIB)
Chemistry IIIB	540.31	1	Chemistry IIA ¹ (incompatible subject Chemistry IIIA)
Chemistry IV	540.40	—	Chemistry IIIA ³
Economics I	330.10	1	Nil
Economics IIA (microeconomics)	330.20	1	Economics I

SUBJECT	CODE No.	UNIT VALUE	PREREQUISITE SUBJECTS
Economics IIB (economic statistics)	330.21	0.5	Economics I, and either Social Sciences IB or a mathematics subject (incompatible subject Mathematical Statistics II)
Economics IIC (economic history)	330.22	0.5	Economics I
Economics IID (accounting)	330.23	0.5	Economics I (Economics IIA and Economics IIB, Economics IIG or Economics IIH)
Economics IIE (industrial relations)	330.23	0.5	Economics I
Economics IIE (industrial relations)	330.24		
Economics IIG (mathematical economics)	330.26	0.5	Economics I, and either a mathematics subject or a good pass in Social Sciences IB (incompatible subject Economics IIH)
Economics IIH (introductory mathematics for economists)	330.27	0.5	Economics I (incompatible subjects Economics IIG and any mathematics subject)
Economics IIIB (business decision-making)	330.31	1	Economics IIA and Economics IID
Economics IIID (economic theory)	330.33	0.5	Economics IIA
Economics IIIG (econometrics)	330.36	0.5	Economics IIB or Mathematical Statistics II
Economics IVE (quantitative economic planning)	330.44	0.5	Social Sciences IIID or a good pass in Economics IIB
Economics IVM (mathematical economics)	300.33	0.5	Economics IIB, or a mathematics subject
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
Mathematics IA	512.10	1	Nil (incompatible with Mathematics IC)

SUBJECT	CODE No.	UNIT VALUE	PREREQUISITE SUBJECTS
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 and Mathematics IB
Mathematical Statistics II	519.20	1	Mathematics IA
Pure Mathematics II	510.20	1	Mathematics IA and Mathematics IB
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
Mathematics IV	510.40	1	Pure Mathematics II and either Applied Mathematics III, Pure Mathematics III or Mathematical Statistics III
Philosophy I	100.10	1	Nil
Philosophy IIA (formal logic)	100.20	0.5	Philosophy I or two units from the Schools of Biological or Physical Sciences
Philosophy IIB (philosophy of science)	100.21	0.5	Philosophy I or two units from the Schools of Biological or Physical Sciences
Philosophy IIIB	100.31	0.5	Philosophy IIA
Philosophy IIIC	100.32	0.5	A second-year unit in philosophy
Philosophy IIID	100.32	0.5	Philosophy IIA
Philosophy IIJ	100.38	0.5	Philosophy IIA or IIB
Philosophy IIK	100.39	0.5	Philosophy IIA or IIB
Philosophy IIIN	101.32	0.5	Philosophy IIIB
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

SUBJECT	CODE No.	UNIT VALUE	PREREQUISITE SUBJECTS
Physics II	530.20	1	Physics I, first-year mathematics subject
Physics IIIA	530.30	1	Physics II, second-year mathematics subject
Physics IV	530.40	—	Physics IIIA
Psychology I	150.10	1	Chemistry and one of biology, physics, or a branch of mathematics at higher school certificate
Zoology IIO	590.20	1	Biology IB, Chemistry I
Zoology IIP	590.21	1	Biology IB and preferably either Mathematics IA or Mathematics IC
Zoology IIIO	590.30	0.66	Zoology IIP ⁴
Zoology IIIP	590.31	0.66	Zoology IIO ⁴
Zoology IIIS	590.32	0.33	Zoology IIO or Zoology IIP ⁴
Zoology IV	590.40	1	Zoology III

1. In special circumstances, the Board of Studies may accept Chemistry IIB as a prerequisite for Chemistry IIIB.
2. Only for students intending to proceed to honours.
3. Students who have performed well in Chemistry IIIB and another third-year science subject may be admitted to the course.
4. Either Zoology IIO or Zoology IIP will satisfy requirements for Zoology II (second year). Whichever course has not been taken for Zoology II, together with Zoology IIIS, will satisfy requirements for Zoology III (third year). If Zoology IIP has been completed then Zoology IIO and IIIS will satisfy requirements for Zoology III (third year); if Zoology IIO has been completed then Zoology IIIP and IIIS will satisfy requirements for Zoology III (third year).
5. In special circumstances the Board of Studies may accept one of Biology IA or Biology IB.

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La Trobe University.
Handbook.

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