The University of Sydney

Faculty of Science

Handbook 1995

Editor
Robert K. Norris

Faculty of Science Handbook 1995

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The University of Sydney
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Semester and vacation dates 1995

Semester	**Day**	1995
First Semester and lectures begin	Monday	27 February
Easter recess Last day of lectures Lectures resume	 Thursday Monday	 13 April 24 April
Study vacation—1 week beginning	Monday	12 June
Examinations commence	Monday	19 June
Second Semester and lectures begin	Monday	24 July
Mid-semester recess Last day of lectures Lectures resume	 Friday Tuesday	 22 September 3 October
Study vacation—1 week beginning	Monday	6 November
Examinations commence	Monday	13 November

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Contents

Introduction

This is the Faculty of Science Handbook. In it you will find a store of information about things you are likely to need to know about the Faculty.

In particular, it will help you to find out who the people in your Faculty are; the requirements for degrees in the Faculty and the ways that these can be satisfied; what courses are offered and the books required to do these courses; where to turn for more information, advice and help.

When making up your mind about your course of study, look at Chapter 3, dealing with how to get a degree, and also read the Resolutions of the Senate that apply to the degree. If you would like help in deciding on the best course for you to take, talk to someone.

Once you have selected the departments you will be studying in, you will then enrol. The Faculty requires all enrolments to be approved by Faculty Advisers before the completion of the enrolment process. Any further particular requirements of departments you enrol in are given at the beginning of the department's entry in Chapter 4 on courses of study.

Information and advice

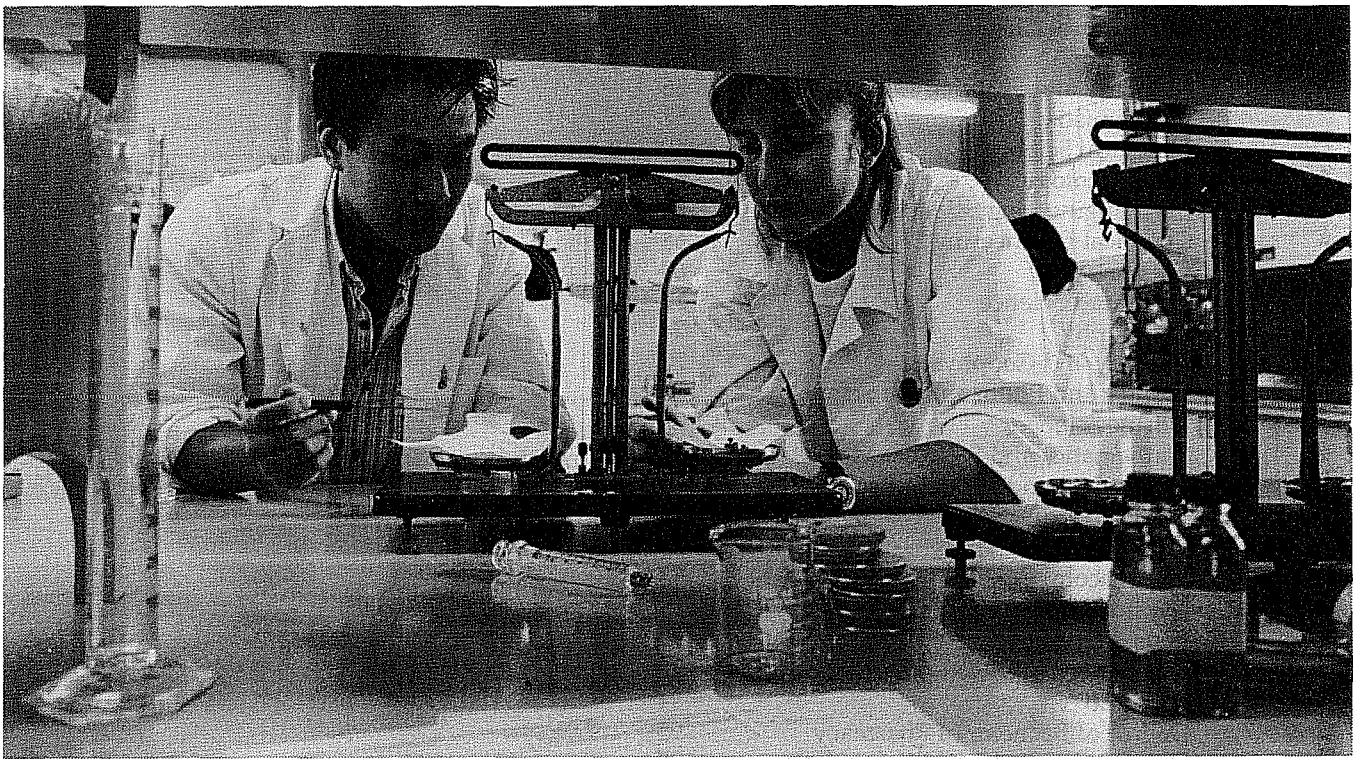
Faculty office

The offices of the Dean and the Secretary to the Faculty are in the Carslaw Building. The Dean is located on level 4 in Room 435 and the Secretary to the Faculty is in the Faculty Office, level 2.

Departmental advisers or Head of Department or section

For questions about particular courses or subjects.

Any special advisers for departments are set out in Chapter 2.



Message from the Dean

On behalf of the Faculty of Science, I extend a warm welcome to all students, particularly those joining us this year. We hope that your stay at the University will be both enjoyable and productive.

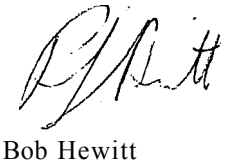
The Faculty has now been in existence for over a hundred years. Its graduates have achieved considerable distinction in many fields and many of them currently occupy important positions in public life, both in Australia and abroad. Many of its departments are held in high regard internationally for their research activities.

Because of its size and its extensive links with other faculties in the University, the Faculty of Science is able to offer a great variety of courses catering for students with a wide range of interests and abilities. Many course combinations provide the preparation required for professional careers in one of the various science disciplines, including the medical sciences and pharmacy, or for further studies at postgraduate level. Other combinations give a broad general background in science and are excellent training for many careers in both the public and private sectors. Some courses are offered at two levels and many others contain advanced level options. The Talented Student Program in the Bachelor of Science degree offers considerable flexibility and challenges for the most able students.

This handbook gives general information about all of the courses available, the departments which provide them and the various regulations which govern progress towards your degree. You can obtain more detailed information about individual courses from the printed material distributed by the relevant departments. Staff from these departments are prepared to discuss various course options with you. The Faculty Office also has staff available to discuss degree structures and related matters. You are encouraged to take full advantage of these sources of advice so that you are in a position to make informed decisions about the content of your degree.

I would also like to draw your attention to the University services which provide valuable assistance to students in more personal areas — the University Health Service, Student Services and the Careers and Appointments Service. If you encounter a problem of a personal nature, you are welcome to discuss it with me or with one of the Associate Deans; in either case it is advisable to make an appointment at the Faculty Office.

I wish you every success in your studies.



Bob Hewitt
Dean

1 Staff[1]

FACULTY

Dean
Professor Robert G. Hewitt

Pro-Dean
Associate Professor Helen C. Beh

Associate Deans
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Associate Professor Gerald M. Holder
Associate Professor Robert K. Norris
Associate Professor Damon D. Ridley
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Administration Manager
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Resources Manager
Dorothea Sophia, BEd *Deakin*

Secretary to the Faculty
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DEPARTMENTS/SCH00LS

Agricultural Chemistry and Soil Science

Professor

Reader
Ivan R. Kennedy, BSc(Agric) PhD DSc(Agric) *WAust.*

Associate Professors
Les Copeland, BSc PhD
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Alexander B. McBratney, BSc PhD *Aberd.*

Senior Lecturers
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Edith M. Lees, BSc PhD *Lond.*

ARC Research Associate
Sunietha Katupitiya, MSc *Perad'ya* PhD *Leuven*

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Postdoctoral Fellow
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Professional Officers
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Technical Officers
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Kevin McLauchlan

Administrative Assistant
Pamela Clifford

[1]Staff as known at September 1994

Honorary Appointments

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Honorary Associate
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Research Affiliate
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Jonathan Stone, BSc(Med) PhD DSc, FAA
Appointed 1987

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Philomena McGrath, MD BS, FRACS
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Associate Lecturers
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Visiting Scholar
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Appointed 1980

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NH&MRC Senior Research Fellow
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Joanne Tilbrook

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Michael A. Messer, MSc PhD *Melb.*

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Human Nutrition Unit

Boden Professor of Human Nutrition
Arthur Stewart Traswell, MB ChB MD *Cape T.,* FRCP FFPHM FRACP
Appointed 1978

Senior Lecturers
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Janette C. Brand Miller, BSc PhD *N.S.W.,* FAIFST

Kellogg Lecturer in the Human Nutrition Unit
Philippa Wall, BSc DipNutrDiet PhD

Lecturer
Samir Samman, BSc PhD

Associate Lecturer
SueMunro^ScDeafci'nTeachCertN'c/eCN.S.WJDipNutrDiet

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Honorary Clinical Supervisors
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Lyn Brown, DipIM CertDiet *Melb.*
June Bullock, BSc CertDiet
Susan Burke, BSc DipFoodTech *N.S.W.* DipNutrDiet
Jo Burton, BSc DipNutrDiet
Jane Francis, BSc DipNutrDiet
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Jenny Hazelton, BSc AN. *U.* DipNutrDiet
Hilda High, BSc DipNutrDiet
Wendy Hodge, BSc *N.S.W.* DipNutrDiet
Kate Holliday, BSc DipNutrDiet
Margaret Holyday, BSc DipNutrDiet
Michelle Hughes, BSc DipNutrDiet
Helen Knott, BSc CertDiet *N'cle(N.S. W.)*
Maria Kokkinakos, BSc DipNutrDiet

Debbie Lillienthal, BScHEc *(Canada)* GradDipEdStud
Maria Loveday, BSc *Deakin* CertDiet *Vic.*
Marcelle Middleton, BSc A.N.LI. BSc *U.C.* DipNutrDiet
Dianne Muniz, BSc *N.S. W.* DipNutrDiet *Adel.*
Margaret Nicholson, BSc DipNutrDiet
Rita Nicolaou, BSc DipNutrDiet
Nola Paterson, BSc *Qld* DipNutrDiet
Sue Payne, BHSc RD *Otago*
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Jennifer Ravens, BSc CertDiet
Beth Rohrlach, BSc DipNutrDiet
Margaret Rush, BA(HEc) *W.Ontario*
Fifi Spechler, BSc DipNutrDiet
Brett Thompson, BSc GradDipDiet *Curtin*
Dian Tranter, BSc DipNutrDiet
Amanda Whitworth, BSc *N.S.W.* DipNutrDiet
Peter Williams, BSc *A.N.U.* MHP *N.S.W.* DipNutrDiet
Stella Wiggins, BSc *Macq.* DipNutrDiet
Sue Wright, BSc DipNutrDiet

Laboratory Assistant
Zaffar Khan (half-time)

Administrative Assistants
Isa Hopwood (half-time)
Marianne Alexander

Biological Sciences

Challis Professor of Biology
Ian Douglas Hume, BSc(Agric) PhD *W.Aust.* DSc N.E., FAIBiol
Appointed 1987

Professors of Biology
•David Joseph Patterson, PhD *Brist.* DSc *Qu.*
Appointed 1992

Professor of Biology (Genetics)
Ronald Anthony Skurray, AUAPharm BSc PhD DSc *Adel.* MASMFAIBiol
Appointed 1991

Professor in Experimental Ecology (Personal Chair)
Antony J. Underwood, PhD DSc *Brist.,* FAA FLS FIBiol FAIBiol CBiol
Appointed 1992

Professor in Evolutionary Biology (Personal Chair)
Richard Shine, BSc *A.N.U.* PhD *N.E.* DSc
Appointed 1993

Reader
Alan W. Meats, BSc *Durh. FhDN'cle(U.K.),* FRES *(McCaughey Lecturer in Entomology)*

Associate Professors
William G. Allaway, MA *Camb.* PhD *Lane.*
Patricia J. Armati, MSc PhD, MAIBiol
Christopher B. Gillies, MAgrSc *Qld* PhD *Alia*
Anthony W.D. Larkum, BSc *Lond.* DPhil *Oxf.,* ARCS

Director of First Year Biology
Mary Peat, BSc *Birm.* PhD *Brist.*

Senior Lecturers
Christopher Dickman, BSc *Leeds* PhD *A.N.U.*
Rosalind T. Hinde, BSc PhD
Michael J. Kingsford, BSc *Cant.* MSc PhD *Auck.*
j Stephen Morris, BSc *Lond.* PhD *Glas.*
Robyn L. Overall, BSc *N.S.W.* PhD *A.N.U.*
Michael B. Thompson, BSc PhD *Adel.*

Lecturers
Murray J. Henwood, BSc *Well.* PhD *A.N. U.*
Ove Hoegh-Guldberg, PhD *U.C.L.A.* BSc
Bruce Lyon, BSc PhD *Monash*
Peter McGee, BAgrSc PhD *Adel.* DipHEd *N.S. W.*
Jan Marc, BSc PhD *N.S. W.*

Lecturers (half-time)
Jennifer Donald, BA *Macq.* PhD *Adel.*
Kathryn Raphael, BA PhD *Macq.*
Associate Lecturers
Susan Franklin, BSc *Wales* MSc *S'ton* PhD
Russell Graham, BAppSc *U.T.S.* DipEd *Syd.Inst.Ed.* BSc
Kaliope Katsikaros, BSc
Deborah Shearman, MSc
Charlotte Taylor, BSc *Dund.* PhD *Aberd.*

Associate Lecturers (half-time)
Siegfried Krauss, BSc
Elizabeth May, BSc DipEd *N.S. W.*
Jeanette Muirhead, BSc

ARC Senior Research Fellow
Marianne Frommer, BSc PhD

Senior Research Associates
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Klaus Koop, Vordiplom *Hamburg* MSc PhD *Cape T.*

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Thomas R. Madsen, BSc PhD *Lund*
Mats Olsson, BSc PhD *Gotenborg*
S. Adele Post, PhD *Macq.* BSc
Raymond J. Ritchie, BSc PhD
Gregory W Rouse, MSc *Qld* PhD
Carol D. Scaramuzzi, BSc MSc PhD *Macq.*
Gregory A. Skilleter, BSc PhD

Professional Officers Grade III
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Janice L. Jacobs, BSc(GenSc)
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Finance Officer
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Computer Systems Officer
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Basil Panayotakos
Malcolm Ricketts, BSc *Macq.* PhotogCert *S.T.C.*
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Heather Sowden, BiolTechCert *S.T.C.*
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Margaret Gilchrist, BiolCert *S.T.C.*

Anne-Laure Esnault, BSc
Graham Housefield, *BiolTechCert Arm.T.C.*
Hamish MacKenzie, BiolCert *S.T.C.*
Ralph Maddox, BiolTechCert *Arm.T.C.*
Claudio Muhlrad, BiolTechCert *S.T.C.*

Curator of Zoological Collections
Angela Low, BSc (part-time)

Laboratory Assistants
Stephen Burrowes, BSc
Hamlet Giragossyan (half-time)
Miliary Ferenczi, BAgrSc *Godallo*

Attendants
Hamlet Giragossyan (half-time)
Julio Pena

Caretaker (Crommelin Biological Field Station, Pearl Beach)
Eric Pearce

Gardener
Jaqelin Elliot

Administrative Assistants
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Sandra Meiras-Colley
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Sabine Krause
Sylvia Warren
Pamela Wray

Honorary Appointments

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Charles Birch, BAgrSc *Melb.* DSc *AAA.,* FAA FAAAS
Michael G. Pitman, OBE, MA PhD ScD *Camb.,* FAA
Spencer Smith-White, DScAgr, FAA
John Alexander Thomson, MSc MAgrSc PhD *Melb.*

Visiting Professor
Neil Willetts, MA PhD *Camb.*

Honorary Associate
Valerie B. Morris, BSc PhD *Edin.*

Honorary Research Associates
Tony D. Auld, BSc PhD
Ross A. Bradstock, BSc PhD
Judith M. Caton, BSc *Mel.* MA *A.N.U.* DipEd C.C.A.E.
Anders Forsman, BSc PhD *Uppsala*
Nerida J. Holdaway, BSc
David A Keith, BSc PhD

Honorary Teaching Associates
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Allen E. Greer, BA *Stan.* PhD *Harv.*
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Jeffrey M. Leis, BSc *Arizona* PhD *Hawaii*
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John R Paxton, BA MSc PhD *S.Calif.*

Visiting Scholars
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David J. Fletcher, MSc PhD *S'ton*
Matthias Gilbert, Diplom Biologie *Wurzburg PhD Munich*
Bea Hondeweld, MSc *Amsterdam*
Youyong Zhu, MSc *Yunnan*

Chemistry

Professor in Chemistry (Organic Chemistry) (Personal Chair)
Leslie D. Field, PhD DSc, FRACI CChem
Appointed 1994

Professor of Chemistry (Inorganic Chemistry)
Hans Charles Freeman, MSc PhD, FAA FRACI FRSC CChem
Appointed 1971

Professor of Chemistry (Organic Chemistry)
Sever Sternhell, PhD DSc DIC *Lond.* MSc, FAA FRACI CChem
Appointed 1977

Professor of Chemistry (Organic Chemistry) (Personal Chair)
Walter Charles Taylor, PhD DSc *Mane.* MSc, FRACI CChem
Appointed 1985

Professor in Chemistry (Organic Chemistry) (Personal Chair)
John T. Pinhey, PhD DSc, FRACI CChem
Appointed 1992

Professor of Chemistry (Physical Chemistry)
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Appointed 1985

Professor of Chemistry (Theoretical Chemistry)
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Appointed 1991

Professor in Chemistry (Theoretical Chemistry) (Personal Chair)
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Appointed 1992

Reader
Peter A. Lay, *BScMelb.* PhD AN.LL, FRACI CChem *(Inorganic Chemistry)*

Associate Professors
Robert S. Armstrong, MSc PhD, MRACI CChem *(Inorganic Chemistry)*
James K. Beattie, BA *Prin.* MA *Camb.* PhD *Northwestern,'* FAAAS FRACI FRSC CChem *(Inorganic Chemistry)*
Maxwell J. Crossley, BSc *PhD Melb.,* MRACI CChem *(Organic Chemistry)*
JohnC. Mackie, MSc PhD, FRACI *CChem(Physical Chemistry)*
RobertK. Norris,DIC *Lond.* PhD DSc, FRACI CChem *(Organic Chemistry)*
Damon D. Ridley, BSc PhD, FRACI CChem *(Organic Chemistry)*

Director of First Year Studies
Raymond K. Pierens, MSc PhD, MRSChem MRACI CChem

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Margaret A. Brimble, MSc *Auck.* PhD *S'ton*
James M. Eckert, BA MSc PhD, MRACI CChem
Trevor W. Hambley, BSc *WAust.* PhD *Mel.,* FRACI CChem
Margaret M. Harding, BSc PhD, MRACI CChem
Julia M. James, BSc PhD *Lend.,* MRACI CChem
Anthony R. Lacey, MSc PhD, MRACI CChem
Anthony F. Masters, BSc *Melb.* PhD *A.N.U.,* FRACI CChem
Donald V. Radford, MSc PhD DipEd *N.E.*
Gregory G. Warr, BSc PhD *Melb.,* MRACI CChem

Lecturers
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Anthony P. Lang, BSc PhD *Qld*

Lecturers (fixed-term)
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Mark W. Rutland, BSc PhD *A.N.U.*
Ian J. McNaught, BEd BSc PhD *Monash*

Associate Lecturers
Xiaoming Zheng, MSc *Zhejiang* PhD *N'cle(N.S.W.)*
John Canning, BSc
Jeanette K. Hurst, BSc
Kai Look, BSc
Andrew C. Terentis, BSc

ARC Senior Research Fellows
Richard W. O'Brien, BE *N.S.W.* PhD *Camb. (Physical Chemistry)*
Addy Pross, BSc PhD *(Organic Chemistry)*

ARC Research Fellow
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Professional Assistant
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Pat Matterson
Catherine H. Woods, BA

Honorary Appointments

Professorial Fellow
Dalway J. Swaine, MSc *Melb.* PhD *Aberd.,* FRACI CChem *(Inorganic Chemistry)*

Honorary Associates
Manuel Aroney, AM OBE, PhD DSc, FRACI FRSC CChem CorrMembAcadAthens *(Inorganic Chemistry)*
Phillip T. Crisp, BSc PhD, MRACI CChem *(Inorganic Chemistry)*
Robert J. Hunter, BSc PhD, FAA FRACI CChem *(Physical Chemistry)*

Research Affiliates
Malcolm R. Binns, BSc PhD *(Organic Chemistry)*
Peter Hidi, MSc *Budapest,* FRACI CChem *(Physical Chemistry)*
John R. Kalman, BSc PhD *(Organic Chemistry)*
Jean V. Leyendekkers, DSc *(Physical Chemistry)*
Neale S. McAlpine, BSc PhD *N'cle(N.S.W.) (Inorganic Chemistry)*
David F. Sangster, BSc *Adel.* FRACI CChem *(Physical Chemistry)*
Paul A. Schober, BSc PhD *(Organic Chemistry)*
Paul Wormell, BSc PhD *(Physical Chemistry)*

Basser Department of Computer Science

Professors
}. Ross Quinlan, PhD *Wash.* BSc
Appointed 1988

John Rosenberg, BSc PhD *Monash*
Appointed 1991

Associate Professors
Allan G. Bromley, BSc PhD
Norman Y. Foo, ME *Cant.* MA PhD *Mich.*
Robert J. Kummerf eld, BSc PhD

Senior Lecturers
Alan Fekete, PhD *Harv.* BSc
David Feng, MS *Shanghai Jiao Tong* MS PhD *Calif.*
Elias Dahlhaus, Dr rer.nat. *T.U. Berlin*
Doan B. Hoang, BE *W.Aust.* ME PhD *N'clefN.S.W.)*
Judy Kay, MSc
Jeff Kingston, BSc PhD
Ian A. Parkin, BSc PhD *Adel.*

Lecturers
Frans Henskens, BMath PhD DipEd DipCompSc *N'cle (N.S.W.)*
Nitin Indurkhya, PhD *Rutgers*
Suleyman Sevinc, BS *Istanbul* MS PhD *Arizona*
Antonios Symvonis, DipCompEng&InfoSc *Patras* MS PhD *Texas*
Michael Wise, BA BE PhD *N.S.W.*
Wayne Wobcke, BSc MSc *Qld* PhD *Essex*

Associate Lecturers
James Donovan, BA DipCompSc
Anthony Greening, BAppSci *C.Sturt*
Bert Koch, BSc

Professional Officer Grade II
Ronald Cullen, *BE N.S.W.*

Computer Systems Officers Grade IV
Piers R. Dick-Lauder, BSc DipCompSc *Brad.*
Raymond Loyzaga, BSc *N.S.W.*

Administrative Officer
Helene Orr

Administrative Assistants
Eileen Kemp
Lynette Vincent

Honorary Appointments

Emeritus Professor
John Makepeace Bennett, AO, BE(Civ) BE(Mech&Elec) BSc *Qld* PhD *Camb.,* FTS FACS FBCS HEAust FIMA

Honorary Associates
Donald Herbison-Evans, MA DPhil *Oxf.,* FRSChem FRAS MIEE
Sherman (HsuenRen) Hwa, *BSNatnl Taiwan MSNatnl Chiao Tung (Taiwan)* PhD *Ott.*
Jack R. Phillips, BMechE PhD *Melb.*

Geography

McCaughey Professor

Associate Professors
John Connell, BA PhD *Lond.*
Robin F. Warner, BA *Birm.* PhD *N.E.*

Senior Lecturers
David E.M. Chapman, MEngSc N.S.W. BA PhD
Deirdre Dragovich, MA *Adel.* PhD
Philip Hirsch, BA *Oxf.* MPhil *Dundee* PhD *Land.*
Andrew D. Short, MA *Hawaii* PhD *Louisiana State* BA

Lecturers
Peter J. Cowell, BA PhD
Jamie Gough, BA PhD *Oxf.*
Charles Greenberg, MA PhD *Br.Col.*
Martin C. Thorns, MSc *N.Z.* PhD *Lough.*

Associate Lecturers
Christopher Parker, BSc
William Pritchard, BA *A.N.U.*

Cartographer
John E. Roberts

Honorary Appointments

Emeritus Professor
Trevor Langford-Smith, *BAMelb.* MSc *Adel.* PhD *A.N.U.* BSc

Honorary Associates
Peter Roy, PhD DIC *Lond.* BSc
John Rutherford, BA PhD *A.N.U.*
Edward Wheelwright, DFC MA *St.And.*

Research Affiliate
Philip D. Tilley, BA CertEd *Birm.* DrPhil *Bonn* MSc

Geology and Geophysics

Edgeworth David Professor of Geology and William Hilton Hovell Lecturer
Peter John Davies, BSc *Leic.* PhD *Sheff.*
Appointed 1991

Professor of Geophysics

Senior Lecturers
Gavin F. Birch, MSc PhD GradDipIndAdmin *Cape T.*
John B. Keene, BAgEc ME PhD *Calif.* BSc
Eric A. K. Middlemost, MSc PhD *Cape T.*
Jan J. Stienstra, MSc *Delft*

Lecturers
Jonathan C. Aitchison, MSc *Otago* PhD *N.E.*
Dietmarduller, BSc *Kiel* PhD *Calif.*
Geoffrey L. Clarke, BSc PhD *Melb.*

Associate Lecturers
Thomas CX Hubble, MSc DipEd
Alexandra R. Isern, BSc *Florida* MSc *Rhode Island* PhD *ETH Zurich*
Colin Wilkins, BSc *Hull* PhD/.CU.

Honorary Appointments

Honorary Research Associates
Mike Asten, PhD *Macq.*
David F. Branagan, PhD, FGS
David Clark, MSc
Richard Coleman, BSurv PhD *N.S.W.*
Alan A. Day, PhD *Comb.* BSc, FRAS
Donald W. Emerson, BE MSc *N.S.W.* PhD, FAIG FAIMM
Gabor Foldvary, MSc *N.S. W.*
Roger Henderson, MSc
Michael Hughes, BEc PhD
Huw Jenkins, PhD *Wales*
Andrew McMinn, BSc PhD *Macq.*
Philip Mulhearn, PhD
Gordon Packham, BSc PhD
Charles Phipps, PhD *Tor.* BSc
Anne Reeckmann, BSc PhD *Melb.*
Erwin Schneiber, RNDR *J A. Comenius U.*
Barry Webby, MSc *N.Z.* PhD DSc *Brist.,* FGS
Harry Welsh, MSc
Kenneth Williams, MSc N.E. PhD *A.N. U.* BSc

Mathematics and Statistics

Professors
Edward Norman Dancer, BSc *A.N.U.* PhD *Camb.*
Appointed 1993

Gustav Isaac Lehrer, PhD *Warw.* BSc
Appointed 1990

John Robinson, BSc *Old* PhD
Appointed 1991

Eugene Seneta, MSc *Adel.* PhD *A.N.U.,* FAA
Appointed 1979

Professorial Fellow (half-time)
Peter Robert Wilson, BA MSc *Melb.* PhD, FRAS

Readers
John J. Cannon, MSc PhD
Donald I. Cartwright, PhD *III.* BSc
Jonathan Hillman, BSc *WAust.* AM *Haw.* PhD AN.U.
Tzee-Char Kuo, BS *Natnl Taiwan* PhD *Chic.*
King-Fai Lai, BSc *Lond.* MPhil PhD *Yale*

Associate Professors
Christopher J. Durrant, MA PhD *Camb.*
Edward D. Fackerell, MSc PhD
Terence M. Gagen, BSc *Qld* PhD *A.N.U.*
Ronald W. James, BSc PhD
John M. Mack, MA *Camb.* BSc PhD
Robert F.C. Walters, MSc *Qld* PhD *A.N.U.*
Denis E. Winch, MSc PhD, FRAS

Director of First Year Courses
Geoffrey R. Ball, BA

Senior Lecturers
Peter W. Buchen, PhD *Camb.* BSc
Koo-Guan Choo, BSc *Nan.* MSc *Ott.* PhD *Br.Col.*
Christopher M. Cosgrove, BSc PhD
Alexandru Dimca, PhD *Bucharest*
Roger W. Eyland, PhD *Camb.* MSc
W. Barrie Fraser, BSc ME *Cant.* SM PhD *Harv.*
David J. Galloway, BA PhD *Camb.*
William G. Gibson, MSc *Cant.* PhD *N.S. W.*
Robert B. Howlett, BA PhD *Adel.*
Philip B. Kirkpatrick, BA PhD
Charles MacaskiU, BSc PhD *Adel.*
Gordon P. Monro, BSc *Monash* PhD *Brist.*
Nigel R. O'Brian, MA *Camb.* PhD *Warw.*
William D. Palmer, MLitt MA N.E. BSc PhD DipEd
Malcolm P. Quine, MSc *Lond.* PhD *A.N.U.*
Donald E. Taylor, MSc *Monash* DPhil *Oxf.*
James N. Ward, BSc PhD
Neville C. Weber, MSc PhD
Karl H. Wehrhahn, BSc *Aha* PhD

Lecturers
Howard J. D'Abrera, PhD *Calif.* BSc
David Easdown, BA *A.N.U.* PhD *Monash*
David C. Edelman, MPhil PhD *Col.* SM *M.I.T.*
Humphrey M. Gastineau-Hills, MSc PhD
Jenny Henderson, DipEd *Flin.* MSc
T. Paul Hutchinson, MA *Camb.* PhD *Lond.*
David I. Ivers, BSc PhD
Hugh Luckock, BSc *Auck.* PhD *N'cle(U.K.)*
Mary R. Myerscough, DPhil *Oxf.* MSc

Adrian M. Nelson, PhD *Lond.* BSc
Adam Parusinski, MSc *Gdansk* PhD *Jagiellonian*
Laurentiu Paunescu, MSc *Bucharest* PhD
M. Shelton Peiris, DipMath MSc *Peradeniya* PhD *Monash*
Mary C. Phipps, MSc
Vladislav Zheligovsky, DipSci PhD *Moscow*

Associate Lecturers
Sandra C. Britton, BSc *N.S.W.* MA
Stephen W. Goulter, BSc *Cant,* MSc DipOR *Well.*
Deryn Griffiths, PhD *Macq.* BSc
Amitavo Islam, BSc *A.N.U.*
Sarah L. Israel, BSc
Jennifer Kearns, BSc *N.S. W.* BA *Macq.*
Waf aa Khalil, BSc
Oh Kang Kwon, BSc PhD *M.I.T.*
Jennifer S. Law, BSc
Kam-Ping Mok, BA DPhil *H. K.*
Duong Phan, LicMath *Hue* MA PhD
Visensia Suhana, BSc *Auck.* BSc *N.S.W.*
Shu Hao Sun, MSc *Shannxi Normal* PhD *Sichuan*
William R. Unger, MSc PhD
Remy Van de Ven, BApplSc *D.D.I.A.E.* MStats *N.S.W.*
Fernando Viera, BEng MEngSc PhD *N.S. W.*

Computer Systems Officers
Daniel G.M. Harrison, BSc *N.S. W.*
Robert B. Pearson, BSc ADipA *M.C.A.E.*
James S. Richardson, PhD *Warm.* MSc
Paul Szabo, BSc *Havana*

Australian Senior Research Fellow
Brian Gray, PhD DSc *Mane,* FRACI FRSC

Administrative Officer
Deirdre Lawrie, MA *Dund.*

Administrative Assistants
Flora Armaghanian
Viola Chao
Yit-SinChoo
Janet Doyle
Adele James
Catherine M. Kicinski
Kazuko Yamamoto, BA *Tokyo Women's Christian Coll.*

Honorary Appointments

Emeritus Professors
Gordon Elliott Wall, BSc *Adel.* PhD *Camb.,* FAA
Gregory Maxwell Kelly, BA PhD *Camb.* BSc, FAA

Honorary Associates
Michael S. Johnson, BSc PhD
David E. Rees, MSc PhD
Ross H. Street, BSc PhD

Microbiology

Professor
Peter Richard Reeves, BSc PhD *Lond.,* MASM
Appointed 1985

Reader
Thomas Ferenci, BSc *Lond.* PhD *Leic.*

Senior Lecturers
Trevor Duxbury, BSc PhD *Liv.,* MASM
Peter B. New, BAgrSc *Tas.* PhD *Adel.*

Lecturers
Ilze Dalins, MSc
Ian Humphery-Smith, BSc PhD *Qld*

Associate Lecturers
Helen M. Agus, MSc *N.S.W.,* MASM
Kerrie A. Lawson, BSc PhD *N.S.W.,* MASM

Honorary Appointments

Honorary Associates
K. Yip Cho, BSc *N.S. W.* PhD AN. *U.*
William G. Murrell, PhD *Oxf.* DScAgr, FAIFST MASM

Pathology

CELL PATHOLOGY

Professor
Nicholas H. Hunt, BSc PhD *Aston*
Appointed 1989

Reader
John R. Gibbins, MDS PhD

Senior Lecturer
Nicholas J.C. King, MB ChB *Cape T.* PhD AN. *U.*

Pharmacology

Professor of Clinical Pharmacology
J. Paul Seale, PhD *Lond.* MB BS, FRACP
Appointed 1992

Professor
Graham Allen Ross Johnston, PhD *Camb.* MSc, FRACI
Appointed 1980

Clinical Professor
Gillian M. Shenfield, MA BCh DM *Oxf.,* FRCP FRACP

Associate Professors
Judith L. Black, MB BS PhD
Rosemarie Einstein, BSc PhD
Ewan J. Mylecharane, BPharm *V.1.C* BSc PhD *Melb.*
Graham A. Starmer, MSc *Mane.* PhD

Clinical Associate Professor
Geoffrey G. Duggin, PhC MB BS, FRACP

Senior Lecturers
Robin D. Allan, BSc *Qld* PhD *James Cook*
Macdonald J. Christie, BSc *Flin.* PhD
Richard Donnelly, MB ChB *Birm.* PhD *Glas.,* MRCP
Christopher Liddle,MBBSBSc(Med)LI.N.S.W.PhD,FRACP
Jill E. Maddison, BVetSci PhD
Ian Spence, PhD *Monash* BSc

Lecturer
Hilary G.E. Lloyd, BSc *Brist.* MSc PhD *Lond.*

Associate Lecturers
Izabela M. Brzuszczak, BSc
Ioakim Konnaris, BSc *N.S. W.*

Honorary Appointments

Honorary Associates
Sandra D. Anderson, PhD *Lond.* BSc
Gregory B. Chesher, MSc PhD
L. Bruce Cobbin, BSc *Melb.* PhD
David LB. Kerr, BSc PhD *Adel.*
Diana M. Temple, BSc *W.Aust.* MSc PhD

Research Affiliates
Peter R. Andrews, BSc PhD *Melb.,* FRACI
John Boutagy, BPharm MSc PhD
Les P. Davies, BSc *Flin.* PhD *A.N.U.*
Peter R. Dodd, BSc PhD *Lond.*
George M. Eckert, MB BS MSc PhD, FPS
George Holan, DipAppChem *Melb.* DSc *R.M.I.T.,* FRACI FAATS
Merlin E.H. Howden, PhD *Cal.Tech.* BSc
Rymantas Kazlauskas, BSc PhD
Graham M. Nicholson, BSc PhD
Jennifer Ong, BSc PhD *Adel.*

Lesley J. Rogers, BSc *Adel.* PhD *Sussex*
Rob P. Weatherby, BPharm MSc PhD
Sandra N. Webb, BPharm *Vic.l.C.* PhD *Strathdyde*
Max Willow, MB BS *N.S.W.* PhD *A.N.U.* MSc

Pharmacy

Professor of Pharmaceutical Chemistry
Basil Don Roufogalis, MPharm PhD, MPS
Appointed 1989

Professor of Pharmaceutics
Kenneth Frederick Brown, MPharm PhD, MPS
Appointed 1992

Professor of Pharmacy Practice
Shalom Isaac Benrimoj, BPharm PhD *Bradford,* MPS
Appointed 1991

Reader
H.T. Andrew Cheung, MSc *H.K* DIC PhD DSc *Lond.,* FRACI FRSChem *(Pharmaceutical Chemistry)*

Associate Professors
Gerald M. Holder, PhD *Lond.* MSc, MPS
Douglas E. Moore, MSc PhD

Senior Lecturers
Carol L. Armour, BPharm PhD, MPS
David J. Cutler, PhD *Lond.* BPharm MSc
Iqbal M. Ramzan, DipPharm *C.I.T. N.Z.* MSc PhD

Lecturers
Colin C. Duke, BSc *Qld* PhD *James Cook,* MRACI
Elizabeth M. Gipps, MPharm *V.I.C.* DrScNat E.T.H. *Zurich* DipHPharm, MPS
Ross A. Kennedy, BPharm PhD *Qld*
Ines Krass, BPharm GradDipEd DipHPharm PhD, MPS

Associate Lecturers .
Timothy F. Chen, BPharm DipHPharm, MPS
Erica Sainsbury, BPharm MSc, MPS
Michael D. Smith, BSc *James Cook*
Susan J. Taylor, MSc *Lond.* BPharm, MRPharmS

Joint Appointments — Teacher Practitioners
Ben J. Basger, BPharm MSc DipHPharm, MPS
Cara M. Murphy, BPharm DipHPharm
Lisa Pulver, BPharm DipHPharm, MPS
Kim Sucic, BSc BPharm DipHPharm
Paula A. Whitehead, BPharm, MPS

Research Fellow
Lesley Wright, BSc *Qld* MSc *Macq.* PhD

Postdoctoral Fellow
Samiuddin K. Syed, MSc *Alig.* PhD *Osm.*

Senior Research Officer
Mary A. Smal, BSc PhD

Research Officers
Margaret Hughes, BSc PhD
Tariq Khan, MSc PhD *Alig.*

Professional Officers Grade IV
Warren A. Olsen, BCom *N.S.W.* BPharm MSc, MPS
Fred T. K. Wong, DipMedTech *S.T.C.* MSc, FACBS

Professional Officer Grade III
Bruce N. Tattam, MSTIA

Senior Research Assistants
Dieu D. Chau, PhD *Macq.*
Nancy Chetaiti, BPharm DipHPharm, MPS MSHPA
Sandra Ferrington, BPharm, MPS
Eleanor Kable, BSc *Griffith* MSc *Qld*
Sue Serafim, BPharm, MPS

Research Assistants
Qian Li, MSc PhD *Zhongshan*
David Mascord, BA *N'cle(N.S.W.)* MPhil

Senior Technical Officers
Helen Elimelakh, BE *Mendeleev Inst.*
Bill Rae

Technical Officers
James Tyndall
Jiamin You, BSc *Shanghai*

Laboratory Assistants
Maria Baca
Neville Baker
Jenny Bell

Administrative Assistants
JudyBanwell
Rosemary Maltos
Mary Moore
Rages Palanisamy

Librarian
Gail Y. Higgins, BA DipEd GDipLibSc *Ku-ring-gai C.A.E.,* ALIA

Attendant
Jay CSullivan

Glassware Cleaners
Freda Kambosos
WinKyi

Honorary Appointments

Honorary Professorial Fellow
Barry J Allen, PhD *W'gong* DSc *Melb.,* FAIP

Honorary Associate
Richard Thomas, PhD MSc, FPS

Honorary Clinical Senior Lecturer
Susan Tett, PhD BPharm

Honorary Clinical Lecturers
Margaret J Duguid, BPharm DipAdmin
Gwen M Higgins, BPharm, FSHP
Kingsley Ng, BPharm MSc DipFDA, FSHP FAIPM MPS
Terry Maunsell, BPharm, FSHP MPS
William Montgomery, BPharm
Elizabeth M. Perks, BPharm, FSHP - '
Lynn Weekes, BPharm, FSHP

Honorary Clinical Supervisors
Eugenia Fiakos, BPharm
Stephen Kerr, BPharm

Physics

Professor of Physics (Theoretical Physics)
Donald Blair Melrose, BSc *Tas.* DPhil *Oxf,* FAA
Appointed 1979

Professor of Applied Physics
Richard Edward Collins, PhD *N.Y.* BSc, FTS FIE
Appointed 1980

Professor of Physics (Plasma Physics)
Maxwell Howard Brennan, AO, HonDSc *Flin.* BSc PhD, FAA
Appointed 1981

Professor of Physics (Astrophysics)
Lawrence Edward Cram, BSc BE PhD
Appointed 1987

Professor of Physics (Astronomy)
John Davis, BSc PhD *Mane.*
Appointed 1987

Professor of Physics (Physical Optics)
Colin J.R. Sheppard, MA PhD *Camb.* DSc *Oxf.*
Appointed 1989

Professor in Physics (Electromagnetic Physics)
Ross C. McPhedran,.BSc PhD las.

Readers
Richard W. Hunstead, BSc PhD
David R. McKenzie, BSc PhD *N.S.W.*

Telescope Project Manager
Michael I. Large, BA PhD *Camb.*

Associate Professors
Rodney C. Cross, BSc PhD DipEd
Robert G. Hewitt, BSc PhD
Bernard A. Pailthorpe, BSc *N.S.W.* PhD *Indiana*
Lawrence S. Peak, BSc PhD

Senior Lecturers
Ian M. Bassett, MSc PhD *Melb.*
G. Fergus Brand, MSc *Otago* PhD
Carol J. Cogswell, MA MArch *Oregon*
Neil F. Cramer, BScPhD
David F. Crawford; BSc PhD
Ian S. Falconer, MSc *N.Z.* PhD *A.N. U.*
Brian W. James, BSc PhD
Ian D.S. Johnston, BSc *Qld* PhD
James B.T. McCaughan, MSc PhD
J. Gordon Robertson, BSc AfeZ. PhD
Peter A. Robinson, BSc PhD
William J. Tango, BS *Calif.* PhD *Colorado*
Anthony J. Turtle, BA PhD *Camb.*
Juris Ulrichs, BSc PhD)
ARC Australian Research Fellow
Elaine M. Sadler, BSc *Old* PhD *A.N.U.*

Lecturers
Andrew J. Booth, BADPhil *Oxf.*
Robert A. Minard, BSc PhD Gmf.
John W. CByrne, BSc PhD
Marujn de Sterke, MEhg *Delft* PhD *Rochester*
Paul J. Walker, BSc PhD DipEd *N.S.W.*
Ian J. Cooper, BSc MPhysics DipEd *N.S.W.*

Senior Research Fellow
David R. Mills, BSc PhD *N.S.W.*

Research Fellows
Yongbai Yin, MSc PhD
Qi-Chu Zhang, MSc PhD *N.S.W.*
Graham M. Turner, BSc PhD

Associate Lecturers
Rosemary M. Millar>,BSc *Qld*
Michael A. 01dfield,.BA *Macq.* DRerNat *Gott.*
Manjula D. Sharma,„MSc DAPh *S.Pac.*

Professional Officer Grade III
Hendrik Bennis, BSc

Professional Officers Grade II
Duncan Campbell-Wilson, BSc *A.N.U.*
S.R. Hashemi-Nezhad; MSc PhD *Birm.*
Philip B. Lukins, PhD

Professional Officer Grade I
Marek Kubis, *MPhys~ Lublin*

Honorary Appointments

Emeritus Professors
Robert Hanbury-Brown, AC, BScEng DIC *Lond.* DSc *Mane,* FRS FRAS FAA HonFNA HonFASc MIEE
Charles B.A. McCusker, DSc *Mane,* MRIA
Harry MesseL CBE, BSc *Qu.* PhD *N.U.I.*
Bernard Y. Mills, BSc ME DScEng, FAA FRS

Honorary Associates
Russell D. Cannon, BA MA PhD *Camb.*
Graham H. Derrick, BSc *Qld* PhD
Ian J. Donnelly, BSc PhD
David L. Jauncey, BSc PhD
Richard N. Manchester, BSc *Cant.* PhD *N'cle(N.S.W.)*
Philip J. Martin, BSc *Aston* PhD *A.N. U.*
Brian A. Mclnnes, BSc PhD *Qld*
Lindsey F. Smith, BSc PhD *A.N.U.*
Murray W. Winn, PhD *Birm.* BSc

Visiting Professor
Parameswaran Hariharan, BSc *Travancore* PhD *Kerala*

Research Affiliate
Geoffrey B. Smith, BSc *N.E.* PhD *Monash*

Research Fellow for Theoretical Astrophysics
Director
Donald B. Melrose, BSc *Tas.* DPhil *Oxf, FAA*

Research Fellows
Lewis T. Ball, BSc PhD
Simon Johnston, BSc *Edin.* PhD *Mane.*
Jennifer A. Nicholls, BSc *Flin.* PhD *Durh.*
Helen Pongracic, BSc *Melb.* PhD *Monash*
Michelle C. Storey, BSc PhD
Kinwah Wu, MS PhD *Louisiana*

Postdoctoral Fellows
Qinghuan Luo, MSc *Heilongjiang* PhD
Mark A. Walker, BA *Oxf.* PhD *Venn.*

Physiology

Professors
John Atherton Young, AO BSc(Path) MD BS DSc *Qld,* FRACP FAA
Appointed 1976

Maxwell Richard Bennett, BE MSc PhD *Melb.* DSc, FAA
Appointed 1983

David Grant Allen, BSc MB BS PhD *Lond.*
Appointed 1989

Ann E. Sefton, BSc(Med) MB BS PhD DSc
Appointed 1992

Readers
Roger A.L. Dampney, BSc PhD
Joseph F.Y. Hoh, PhD *A.N.U.* BSc(Med) MB BS DSc
Brian J. Morris, BSc *Mel.* PhD *Monash* DSc

Associate Professors
David I. Cook, BSc(Med) MB BS MSc
David F. Davey, BSc PhD *McG.*
Barry S. Gow, MDS PhD, FRACDS

Clinical Associate Professor
Christopher O'Neil, BSc PhD *N'cle(N.S.W.) (Obstetrics and Gynaecology)*

Senior Lecturer
Rebecca S. Mason, MB BS PhD

Lecturers
Simon Carlile, BSc PhD

Lynne J. Cottee, BSc PhD
Miriam Frommer, PhD *Land.* BSc
Paul R. Martin, BSc PhD
William D. Phillips, BSc PhD

Associate Lecturer
Francoise Janod-Groves, BSc *N.S.W.I.T.* MApplSc *U.T.S.*

Professional Officer Grade II
Alanjoffe, BSc *N.S.W.*

Computer Systems Officer Grade IV
John W.A. Dodson, HNC *Lond.,* MIEEIEI Eng

Honorary Appointments

Emeritus Professor
William Burke, BSc PhD *Lond.*

Research Affiliates
Annick Ansselin, BA *Macq.* MSc PhD
Lyn R. Griffiths, BSc *N.S.W.* PhD *Griffith (Gold Coast)*

Psychology

Professor
Robert Alan Boakes, BA *Cant.* PhD *Harv.*
Appointed 1989

Readers
Dale M. Atrens, BA *Windsor* MA *Hollins* PhD *Rutgers*
Ian S. Curthoys, PhD *Monash* BA
Lazar Stankov, MA *Belgrade* PhD *Denver*

Associate Professor
Helen C. Beh, BA PhD N.E.

Senior Lecturers
Brian D. Crabbe, BA PhD
Alan E. Craddock, BA PhD
R.F. Soames Job, BA PhD
David J. Kavanagh, BA PhD *Stan.* DipPsychol
Cyril R. Latimer, BA PhD
David J. Livesey, BSc PhD *W.Aust.*
Roslyn H. Markham, MA PhD
Terence McMullen, BA PhD
JoelB.MichelLBAPhD
John M. Predebon, BA PhD
David E. Schotte, MS PhD *Virginia*
Robyn Tate, MA MPsychol N.S.W. PhD *N'cle(N.S. W.)*
Alison M. Turtle, MA
Michael B. Walker, BSc *W.Aust.* BA *Mel.* DPhil *Oxf.*

Lecturers
Pauline M. Howie, PhD *N.S. W.* BA
Iain McGregor, MA *Oxf.* PhD
Stephanie P. Whitmont, BA PhD MPsychol

Associate Lecturers
Kate Baggs, BA
Lanrel Bornholt, BA *Melb.* PhD *Macq.*
Maitland M. Bowen, BSc BPsych *W.Aust.* MPsychol
Robert M. Buckingham, BA *Cant.* MA *Auck.*
Margaret Charles, BA
Robert H. Kerr, BA
Justine Lum, BA
Simon Milton, BA
AgiO'Hara,BA
Janette Perz, BA
Agnes Petocz, BA
Sandra Rickards, BA
Richard Roberts, BA
Stuart Smith, BSc
Lynne Sweeny, BA *Calif. S.U.* PhD(Clin) *U.C.L.A.*
Fiona White, BA

Honorary Clinical Supervisors
Sally V. Arpadi, BA MPsychol *N.S.W.*
Amanda Baker, BA MPsychol *N.S. W.*
Julian Ball, BA MA ClinPsychol *Melb.*
Jennifer Batchelor, BSc *LaT.* MSc *Melb.*
Tom Benjamin, BA MBA *Mich.* MPsychol
Sharmila Betts, BA MPsychol
Richard Bryant, BA MPsychol PhD *Macq.*
Mary E. Burke, BA MPsychol *N.S.W.* MA *Macq.*
Barney Casey, BA *Auck.* MPsychol
Jeroen Decates, BPs MClinChPs *Nijmegen*
Michelle Fisher, BSc *A.N.U.* MPsychol *N.S.W.*
Sharon Hanagan, BA MPsychol
Jennifer Flatt, BA MPsychol N.S. *W.*
Gary Fulcher, MA MPsychol
Roberto Garofali, MA DipPsychol
Craig Gonsalvez, MPhil NMH *India* MA *Baroda*
Jane Henry, BA MPsychol PhD
Leanne Humphreys, BA MPsychol
Megan J. Jones, MA DipPsychol
Tom W. Jones, BSc *N.S.W.* MPsychol
Brian Kearney, BA MPsychol
Elizabeth Kennedy, BA MPsychol
Tamara Kitson, BA MPsychol *N.S.W.*
Roy Laube, BSc MA *Loyola*
Wendy Longley, MSc *W.Aust.* MA *Melb.*
Helen McCathie, BA MPsychol
ReneMcCarter,BAN'cfeCN.S.WJMAClinNeuropsychMeZb.
Skye McDonald, MA *Melb.* PhD
Antonia McKinnon, MA DipPsychol
Michael McMahon, BA MPsychol
Richard O'Kearney, BA MPsychol
Olga Piatowska, BA DipPsych
Jean Pollock, BSc *N.S. W.* MPsychol
Kris Revson, MPsychol *Warsaw*
Janice Rigby, BA MPsychol
Dieter Schlosser, BSc *N.S. W.* MPsychol
Christine Senediak, BA *Macq.* MPsychol
Julie Simmons, BA *N'cle(N.S.W.)* MPsychol *N.S.W.*
Barbara Spode, BA MPsychol
Gill Stott, BA MClinPsych *Flinders*
Stephen W. Touyz, BSc PhD *Cape T.* BSc *Witw,*
Carolyn Tow, BSc *Lond.* MPsychol
Nigel Walton, BA MA ClinNeuropsych *Melb.*
Michael Young, BA *Macq.* MPsychol PhD *N.S. W.*

Professional Officer Grade III
John Duckworth, BAppSci *N.S. W.I.T.*

Computer Systems Officer Grade IV
JohnHolden

Administrative Officer
Annette Fraser, BA *Tas.*

Honorary Appointments

Emeritus Professors
Richard Annells Champion, MA, FASSA
Philip Ley, BA *Mane.* PhD *Liv.* DipPsychol *Lond.*
John Philip Sutcliffe, MA PhD, FASSA

OTHER UNITS

Coastal Studies Unit

Director
Andrew D. Short, MA *Hawaii* PhD *Louisana State BA*

History and Philosophy of Science

Associate Professor
Alan F. Chalmers, BSc *Brist.* MSc *Mane.* PhD *Lond.*

Senior Lecturer
Michael Shortland, BSc MA *Land.* PhD *Leeds*

Lecturer
Nicolas Rasmussen, AM *Chic.* MPhil *Camb.* PhD *Stan.*

Administrative Assistant
Shari Lee, BA *Sing.*

Institute of Marine Ecology

Director
Antony J. Underwood, PhD DSc *Brist.,* FAA FLS FIBiol FAIBiol CBiol

Associate Director
Rosalind T. Hinde, BSc PhD

Research Fellows
Maura G. Chapman, BSc *Natal* MSc PhD
Gregory A. Skilleter, BSc PhD

Research Assistants
Vanessa Mathews, BSc
Shannon McCune, BSc

Honorary Appointments

Honorary Associate
J. Howard Choat, MSc PhD *Qld*

Research Affiliates
Neil L. Andrew, MSc *Auck.* PhD
Alan J. Butler, BSc PhD *Adel.*
Peter G. Fairweather, BSc PhD
Steven J. Kennelly, BSc PhD
Keith A. McGuinness, BSc PhD
Nicholas M. Otway, BSc PhD

Ocean Sciences Institute

Director
Peter John Davies, BSc *Leic.* PhD *Sheff.*

Research Scientists
John B. Keene, BAgEc *N.E.* PhD *Calif.* BSc (part-time)
Gavin F. Birch, MSc PhD DTA *Cape T.*
Dietmar Miiller, BSc *Kiel* PhD *Calif.*
Thomas C.T. Hubble, MSc GradDipEd
Douglas D. Bergersen, MSc PhD *Hawaii*
Alexandra R. Isern, BSc *Florida* MSc *Rhode Island* PhD ETH *Zurich*

Senior Research Fellow
Christopher J. Jenkins, BSc PhD *Camb.*

Professional Officer
Elaine Baker, BSc LaT.

Research Assistant
Alison Cole, BSc *N.S.W.*

Technical Officer
David Mitchell (part-time)

Mathematics Learning Centre

Lecturer in Charge
Jacqueline M. Nicholas, MSc *Hull*

Lecturer
Susan E. Gordon, MSc *Witw.* DipEd DipDatametrics *S.A.*

Associate Lecturer
Christopher M. Thomas, BSc N.E. SM *III.* MS *Chic.*

Administrative Assistant
Julie Barry, BA

2 Courses in the Faculty of Science

This handbook is intended to give you a comprehensive view of the courses that the Faculty of Science offers, and to help you select those best suited to your capacity, present needs and intended career.

The Faculty of Science offers a wide range of training intended, on the one hand, to prepare you to become a professional scientist in one or other of the several branches of science (including Pharmacy) and, on the other, to prepare you for careers in non-specialised fields requiring a scientific background.

Courses available

The faculty offers courses in the following subjects:

- Agricultural Chemistry
- Anatomy
- Biochemistry
- Biology
- Cell Pathology
- Chemical Engineering Science
- Chemistry
- Civil Engineering Science
- Computer Science
- Geography
- Geology
- Geophysics
- Histology
- History and Philosophy of Science
- Marine Sciences
- Applied Mathematics
- Pure Mathematics
- Mathematical Statistics
- Mechanical and Aeronautical Engineering Science
- Microbiology
- Pharmacology
- Physics
- Physiology
- Psychology
- Soil Science

In addition to the above, courses are available for the degree of Bachelor of Medical Science and Bachelor of Pharmacy.

Information about these courses is given in Chapter 5.

The courses Anatomy 2 Introductory, Histology 2 Introductory, Physiology 2, Anatomy 3, Histology 3 and Physiology 3 are not available to students who first enrolled in the BSc degree course after 1991. The Department of Physiology has however maintained its current 8-unit Auxiliary course and will continue to teach in the Pharmacy course.

Science disciplines and subject areas available in the Faculty of Science

Acoustics	see Physics
Animal Physiology	see Biological Sciences see BMedSc see Physiology
Analytical Chemistry	see Agricultural Chemistry and Soil Science see Chemistry
Applied Mathematics	see Mathematics and Statistics
Artificial Intelligence	see Computer Science
Astronomy	see Physics
Bacteriology	see Biochemistry see Biological Sciences see BMedSc see Microbiology
Beach Dynamics	see Marine Studies
Biodegradation	see Microbiology
Biological Chemistry	see Agricultural Chemistry and Soil Science see Biochemistry see Chemistry
Bioremediation	see Microbiology
Biotechnology	see Biochemistry see Biological Sciences see Chemistry see Microbiology see Physiology
Behavioural Science	see Psychology
Biophysical Chemistry	see Biochemistry
Botany	see Biological Sciences
Carbohydrate Chemistry	see Agricultural Chemistry and Soil Science see Biochemistry
Catalysis	see Biochemistry see Chemistry
Cancer	see Biochemistry see BMedSc see Cell Pathology see Physiology
Cell Biology	see Biochemistry see Biological Sciences see BMedSc see Cell Pathology see Histology see Microbiology see Physiology
Chemotherapy	see Biochemistry see Chemistry see Microbiology see Pharmacology
Clay Mineralogy	see Agricultural Chemistry and Soil Science
Coastal Morphodynamics	see Marine Studies
Coastal Zone Management	see Marine Studies
Cognitive Science	see Psychology
Colloid Science	see Chemistry
Communicating Science	see History and Philosophy of Science

Pathogenicity	see Microbiology
Pedogeomorphology	see Geography
Pedology	see Agricultural Chemistry and Soil Science
Petrochemicals	see Chemistry
Petroleum Geology	see Geology and Geophysics
Petrology	see Geology and Geophysics
Pharmaceutical Chemistry	see Chemistry see Pharmacy
Philosophy of Science	see History and Philosophy of Science
Physical Chemistry	see Chemistry
Plant Management	see Biological Sciences
Plant Metabolism	see Agricultural Chemistry and Soil Science
Plant Molecular Biology	see Biological Sciences
Plant Physiology	see Biological Sciences
Plant Science	" see Biological Sciences
Plasma Physics	see Physics
Plate Tectonics	see Geology and Geophysics
Polymer Science	see Chemistry
Programming	see Computer Science
Proteins	see Biochemistry see Chemistry
Protozoology	see Biological Sciences
Public Health	see BMedSc
Pure Mathematics	see Mathematics and Statistics
Quantum Mechanics	see Chemistry see Physics
Recombinant DNA Technology	see Biochemistry see Biological Sciences see BMedSc see Microbiology
Robotics	see Computer Science
Scientific Revolution	see History and Philosophy of Science
Sedimentology	see Geography see Geology and Geophysics see Marine Studies
Social Relations of Science	see History and Philosophy of Science
Software Engineering	see Computer Science
Soil Chemistry	see Agricultural Chemistry and Soil Science
Soil Physics	see Agricultural Chemistry and Soil Science
Soil Science	see Agricultural Chemistry and Soil Science
Solid State Science	see Chemistry see Physics
Spectroscopy	see Chemistry
Statistics	see Mathematics and Statistics
Structural Geology	see Geology and Geophysics
Surface Science	see Chemistry see Physics
Systems Analysis	see Computer Science
Therapeutics	see BMedSc see Pharmacology
Theoretical Chemistry	see Chemistry
Theoretical Physics	see Physics
Thermal Physics	see Physics
Toxicology	see Chemistry see Pharmacology see Pharmacy
Vertebrate Zoology	see Biological Sciences
Virology	see BMedSc see Microbiology
Volcanology	see Geology and Geophysics
X-Ray Crystallography	see Chemistry
Zoology	see Biological Sciences

Departmental and Faculty advisers

The selection of courses is particularly important in the Faculty of Science because of the interdependence of the subjects studied. You should therefore consult one of the advisers before the beginning of Semester 1 (see list below).

All first year students will have the opportunity of discussing particular courses of study and any general academic problems with one of the departmental advisers concerned. There will also be advisers available during the enrolment period.

You may seek advice from the advisers, the Associate Deans, Pro-Dean or Dean of the Faculty at any time in the academic year, should the need arise. Advisers should not, however, be regarded as coaches dealing with detailed instruction.

Agricultural Chemistry
Associate Professor Les Copeland, Dr Edith M. Lees

Anatomy
Ms Anne Glucina, Dr J. Provis

Biochemistry
2nd year: Associate Professor Alan R. Jones (BSc degree), Dr Gareth S. Denyer (BMedSc degree)
3rd year: Dr Simon B. Easterbrook-Smith (BSc and BMedSc degrees)
4th year: Dr Ivan G. Darvey

Biological Sciences
1st year: Dr Mary Peat
2nd year: Dr Jennifer Donald, Dr Murray Henwood, Dr Kathryn Raphael, Dr Michael Thompson
3rd year: Dr Ove Hoegh-Guldberg
4th year: Associate Professor Patsy Armati

Cell Pathology
Professor Nicholas Hunt

Chemistry
1st year: Dr Ray Pierens
2nd and 3rd years: Professor Robert G. Gilbert, Dr Tony F. Masters, Associate Professor Robert K. Norris, Dr Scott H. Kable

Computer Science
1st year: Dr Ian Parkin
2nd year: Dr Elias Dahlhaus
3rd year: Dr Jeffrey H. Kingston
4th year: Dr Michael Wise
International Students: Dr Alan Fekete
Research Committee (Research Students): Professor J. Ross Quinlan

Geography
1st year: Associate Professor John Connell
2nd year: Dr Martin Thorns
3rd year: Dr Jamie Gough
4th year: Dr Andrew Short

Geology and Geophysics
1st year: Dr John B. Keene
2nd year: Dr Eric A.K. Middlemost
2nd year Environmental Geology: Dr Gavin Birch
3rd year and Additional: Mr Jan Stienstra
4th year: Dr Geoffrey L. Clarke
Geophysics: Mr Jan Stienstra

Histology
Dr Christopher R. Murphy, Dr Lynette A. Moffat

History and Philosophy of Science
Associate Professor Alan F. Chalmers

Marine Sciences
Dr Andrew D. Short

Mathematics and Statistics
1st year: First-year Office [Mathematics 1 (Life Sciences), Mathematics 1, Mathematics 1 (Advanced)]
2nd year: Dr David J. Ivers (Applied Mathematics 2), Dr Koo-Guan Choo and Dr David J. Ivers (Mathematical Methods 2), Dr Howard D'Abrera (Mathematical Statistics 2), Dr Koo-Guan Choo and Dr David J. Ivers (Mathematics 2 Combined), Dr Koo-Guan Choo, Dr Humphrey Gastineau-Hills (Pure Mathematics 2), Professor John Robinson (Statistical Methods 2 and Advanced Statistical Methods 2)
3rd year: Dr Charles MacaskiU (Applied Mathematics 3), Dr Shelton Peiris (Mathematical Statistics 3), Dr Robert Howlett and Ms Jenny Henderson (Pure Mathematics 3)
4th year: Associate Professor Denis Winch (Applied Mathematics 4), Dr Malcom Quine (Mathematical Statistics 4), Dr Jonathan Hillman (Pure Mathematics 4)

Microbiology
2nd year: Mrs Ilze Dalins
3rd year: Dr Trevor Duxbury
4th year: Dr Tom Ferenci
BMedSc: Dr Ian Humprey-Smith

Pharmacology
2nd Year: Dr Robin Allan
3rd Year: Dr Ian Spence
4th Year: Associate Professor Judith Black

Pharmacy
Associate Professor Gerald M. Holder, Dr Ross A. Kennedy, Dr Ines Krass

Physics
1st year: Dr James B.T. McCaughan
2nd year: Dr William J. Tango
3rd year: Dr G. Fergus Brand
4th year: Dr N.F. Cramer

Physiology
2nd year: Dr Roger Dampney
3rd year: Dr Joe Hoh
4th year: Associate Professor Dave Davey

Psychology
1st year: Ms Agnes Petocz

Soil Science
2nd year: Associate Professor Anthony J. Koppi, Mr Harold G. Geering
3rd and Honours year: Associate Professor Alexander B. McBratney

Recommended combinations of courses in first year of attendance

Courses to be taken during the first year of attendance mustbe selected with subsequent years of candidature in mind. The list below shows how to find a first year combination which will lead to a desired field of specialisation.

Most students should have no reason to depart from these recommendations and no special consideration can be given to students in later years whose difficulties arise from such departures.

Students who are uncertain as to the field(s) of ultimate specialisation are strongly advised to take at least the three courses: Mathematics 1 or Mathematics 1 (Advanced), Physics 1 or Physics 1 (Advanced) and Chemistry 1 or Chemistry 1 (Advanced), thus leaving the widest possible scope for progression in later years.

Students should note that certain Intermediate biomedical courses are only offered as part of the BMedSc degree, although Auxiliary courses may still be available.

Schools or departments, and recommended first year combinations

Computer Science 1 or Computer Science 1 (Advanced) *must not* be taken without either Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences).

Agricultural Chemistry[1]
Chemistry 1 or Chemistry 1 (Advanced)+Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + two of Physics 1 or Physics 1 (Advanced), Biology 1 or Biology 1 (Advanced), Geology 1 and Geography 1

Biochemistry^
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Biology 1 or Biology 1 (Advanced)

Biology
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) + Ma thematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Biology 1 or Biology 1 (Advanced)

'Major subject beginning as an Intermediate course.

Cell Pathology[2]
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Biology 1 or Biology 1 (Advanced)

Chemical Engineering Science
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced)+Mathematics 1 or Mathematics 1 (Advanced) + a course selected in consultation with an adviser

Chemistry
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + a course selected in consultation with an adviser

Civil Engineering Science
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced)+Mathematics 1 or Mathematics 1 (Advanced) + a course selected in consultation with an adviser

Computer Science
Computer Science 1 or Computer Science 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) + two other first year courses

Geography
Geography 1 + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Geology 1 or Biology 1 or Biology 1 (Advanced) + either Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced)

Geology
Geology 1 + Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + a course selected in consultation with an adviser

Geophysics
Geology 1 + Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) + a course selected in consultation with an adviser

Marine Sciences[2]
Biology 1 or Biology 1 (Advanced) + Geology 1 + Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced)

*Mathematical Statistics**
Mathematics 1 or Mathematics 1 (Advanced) + three other first year courses

Mathematics
Mathematics 1 or Mathematics 1 (Advanced) + three other first year courses

Mechanical and Aeronautical Engineering Science
Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) + a course selected in consultation with an adviser

Microbiology[1]
Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Chemistry 1 or Chemistry 1 (Advanced) + Biology 1 or Biology 1 (Advanced) + one other first year course

Pharmacology[2]
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Biology 1 or Biology 1 (Advanced)

Physics
Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced)+Chemistry 1 or Chemistry 1 (Advanced) + a course selected in consultation with an adviser

Preparation for Masters course in Nutrition and Dietetics
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Biology 1 or Biology 1 (Advanced)

Psychology
Psychology 1 + Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) + Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced) + Biology 1 or Biology 1 (Advanced) or Computer Science 1 or Computer Science 1 (Advanced) or a course selected in consultation with an adviser

*Soil Science**
Chemistry 1 or Chemistry 1 (Advanced) + Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS) or Computer Science 1 or Computer Science 1 (Advanced)

Selection of courses in second year of attendance

During Semester 2 of the first year of attendance you are advised to discuss your choice of courses for the following year with members of the academic staff in the departments in which you propose to study.

Students wishing to undertake 8-unit courses in Second Year should note the Faculty restrictions on choiceof Intermediate Introductory and Intermediate Auxiliary courses (see footnotes in the Table of Courses) and are further advised that the allowed combination of a Classification A course with either a Classification SI or Classification S2 course may result in a heavy workload for one Semester and may also produce timetabling problems. Students are strongly advised to consult Faculty and/or Departmental advisers when undertaking these course combina tions.

[1]Major subject beginning as an Intermediate course.
[2]Major subject beginning as a Senior course or an Intermediate introductory course.

3 Undergraduate degree requirements

This chapter sets out the requirements for the degrees of Bachelor of Science, Bachelor of Pharmacy, Bachelor of Medical Science and the combined degrees of BSc/LLB, BA/BSc, BSc/BE and BSc/MBBS. The courses for the pass BSc, BPharm and BMedSc degrees extend over a minimum of three years. For the Honours BSc, • BPharm and BMedSc degrees a fourth year is taken and students must qualify to enter the Honours year. The combined degrees of BSc/LLB, BA/BSc and BSc/BE extend over five years, while the combined degrees of BSc/MBBS extend over seven or eight years depending on the major Science courses chosen.

Restrictions (general)

(1) A candidate for a degree must satisfy the minimurneligibilityrequirements before commencing the degree courses. Courses taken before satisfying these requirements cannot normally be counted for degree purposes.

(2) A candidate may not take a course in any subject without having previously completed the qualifying course or courses appropriate to that subject; or, in the case of a candidate who has not failed in the qualifying course, some other course or courses allowed by the Faculty to count as equivalent. Except with the permission of the head of department, he or she must also complete the prerequisites prescribed and enrol concurrently in any corequisites.

(3) The only combinations of courses available are those permitted by the timetable. A candidate may attend evening courses if they are available.

Examinations and assessment

The Faculty resolved at its meeting on 9 March 1993 that the various forms of assessment of a student's performance in an undergraduate course should include an examination or examinations conducted under University supervision and requiring written answers to unseen questions, *provided* that the general scope of a supervised examination paper may be made known to students in advance.

Results

For all Junior, Intermediate and Senior courses in the Bachelor of Science, Bachelor of Pharmacy and Bachelor of Medical Science degrees, the following mark ranges apply within the Faculty of Science:

HD	High Distinction	85-100
D	Distinction	75-84
CR	Credit	65-74
P	Pass	50-64
T	Terminating Pass*	45-49#
XX	Fail	Below 45 or below 50

*A maximum of 28 units of Terminating Pass units can be credited towards theBachelorof Scienceand Bachelor of Medical Science.

#A Terminating Pass does not apply for:

(a) Senior or Senior Advanced Courses

(b) All courses in the Bachelor of Pharmacy degree.

For Final Year Honours courses, the following Honours grades apply:

HI	Honours Class I	80+
H21	Honours Class II (Division 1)	70+
H22	Honours Class II (Division 2)	60+
H3	Honours Class III	50+
XX	Fail*	Below 50
AXX	Absent Fail*	

*Note that in these cases the award of the Pass degree is recommended.

Boards of Examiners

Undergraduate results are formally determined by Boards of Examiners. The University's *Statutes and Regulations 1994-95* contains the Resolutions of the Faculty relating to the composition of the Boards, and the *Manual for Examiners* (extracts from which may be obtained at the Faculty Office) details the guidelines under which the Boards operate.

Special consideration

The Faculty of Science recognises that the performance of students may be ad versely affected by illness or other misadventure, and makes provision for special consideration of such disabilities when examination results are considered. Faculty intends only to compensate for sub-standard performance in assessments which do not reflect a student's true competence in a subject, and *such provisions must not act to the disadvantage of other students.* Combined Law students should familiarise themselves with the Faculty of Law's provisions as they affect Law subjects.

Any studentwho believes thathis/herperformance has been or may be adversely affected by an occurrence of illness or misadventure may request faculty to give special consideration to the circumstances. *Such* a *request must be made within one week* of the occurrence and must be accompanied by an appropriate medical certificate or other relevant documentary evidence.

Such certificates should state not only the nature of the illness or misadventure but also (where relevant) the opinion of the issuer as to the extent of disability involved.

Where a number of requests for special consideration ha ve been received from one student, faculty may wish to obtain from the medical practitioner or other issuer of corroborating certificates more detail as to the precise extent of the disability. In cases where the faculty believes that other students may be adversely affected by the giving of special consideration, it may require the applicant to obtain a professional opinion from another source.

Any student who is subject to a chronic or recurrent disability or who has been in need of, or undertaken counselling assistance should discuss the matter with a departmental or faculty adviser, as appropriate.

Discontinuation and re-enrolment

Regulationsaboutdiscontinuationandaboutrestrictions imposed on re-enrolment are published in the University's *Statutes and Regulations 1994-95.* Attention is drawnin particular to regulations 18 and 19 specifically concerned with the Faculty of Science, and to those headed 'Students in all Faculties and Boards of Studies'.

The resolutions of the Senate which relate to students enrolled in the Faculty of Science appear below.

Discontinuation of enrolment and re-enrolment after discontinuation — undergraduate

All Faculties[1] and Boards of Studies

> 1. A candidate for a degree of Bachelor who ceases attendance at classes must apply to the Faculty or Board of Studies concerned and will be presumed to have discontinued enrolment from the date of application, unless evidence is produced (i) that the discontinuation occurred at an earlier date and (ii) that there was good reason why the application could not be made at the earlier time.

2. A candidate for a degree of Bachelor who at any time during the first year of attendance discontinues enrolment in all courses shall not be entitled to re-enrol for that degree unless the Faculty or Board of Studies concerned has granted prior permission to re-enrol or the person is re-selected for admission to candidature for that degree.

3. Subject to paragraphs (i) and (ii) of section 1, no candidate for a degree of Bachelor may discontinue enrolment in a course or year after the end of lectures in that course or year.

4. The Dean, Pro-Dean or a Sub-Dean of a Faculty, or the Chairperson of a Board of Studies, may act on behalf of that Faculty or Board of Studies in the administration of these resolutions unless the Faculty or Board of Studies concerned decides otherwise.

Withdrawal from full-year and First Semester courses

5. A candidate for a degree of Bachelor who discontinues enrolment in a full-year or First Semester course on or before 30 March iii that year shall be recorded as having withdrawn from that course.

Withdrawal from Second Semester courses

6. A candidate for a degree of Bachelor who discontinues enrolment in Second Semester course on or before 30 August in that year shall be recorded as having withdrawn from that course.

All Faculties[1] and Boards of Studies except the Faculty of Engineering

Discontinuation

7. (1) A discontinuation of enrolment in a course shall be recorded as 'Discontinued with Permission' when the discontinuation occurs after the relevant withdrawal period and:

(a) on or before the Friday of the first week of Second Semester for a full-year course; or

(b) up to the last day of the seventh week of teaching in a one semester course.

(2) A discontinuation of enrolment in a course shall be recorded as 'Discontinued' when the discontinuation occurs:

(a) after the Friday of the first week of Second Semester for a full-year course; or

(b) after the last day of the seventh week of teaching in a one semester course.

(3) Notwithstandingparagraph(2) the Dean, Pro-Dean or Sub-Dean of the Faculty or Chairperson of the Board of Studies concerned may determine that a discontinuation of enrolment should be recorded as 'Discontinued with Permission' on the grounds of serious ill-health or misadventure.

Latest dates for withdrawals and discontinuations from courses in 1995

Date	Semester 1 courses	Semester 2 courses	Full year courses
till 30 March	Withdraw	Withdraw	Withdraw
31 March to 14 April	Discontinue with permission	Withdraw	Discontinue with permission
17 April to 16 June	Discontinue	Withdraw	Discontinue with permission
12 June to 28 July		Withdraw	Discontinue with permission
31 July to 30 August		Withdraw	Discontinue
31 August to 8 September		Discontinue with permission	Discontinue
11 September to 10 November		Discontinue	Discontinue

Please note: No discontinuations can be made after 10 November 1995.

Restriction upon re-enrolment[1]

The following are extracts from the resolutions of the Senate concerning 'Restriction upon Re-enrolment of Certain Students who fail in Annual Examinations':

1. The Senate authorises any Faculty or Board of Studies to require a student who comes within the provisions of sections 8 to 24 below to show good cause why he or she should be allowed to re-enrol or to repeat a year of candidature or a course in that Faculty or Board of Studies.

'Note that 'Faculty' includes for these purposes a 'College Board'.

2. Subject to section 5, the Faculty or Board of Studies may exclude a student who fails to show good cause from (a) the degree course or year of candidature concerned and/or (b) the course or courses concerned both in the Faculty or Board of Studies and in any other Faculty or Board of Studies in which that course or those courses may be taken.

3. Subject to section 5—

(a) Any student who has been excluded from a year of candidature or from a course or courses by a Faculty or Board of Studies in accordance with section 2 and who wishes to re-enrol in that year of candidature or that course or those courses may apply for such re enrolment after at least two academic years and that Faculty or Board of Studies may permit him or her to re-enrol in the year or the course or courses from which he or she was previously excluded.

(b) Any student who has been excluded from a course or courses by one Faculty or Board of Studies in accordance with section 2 and who wishes to enrol in that course or courses in another Faculty or another Board of Studies may apply for such enrolment after at least two academic years and that other Faculty or Board of Studies may permit him or her to enrol in the course or courses from which he or she was previously excluded.

4. Except with the express approval of the Faculty concerned a student excluded from a year or course who is re-admitted shall not be given credit for any work completed inanother.Faculty or Board of Studies or another university during the period of exclusion.

5. Before exercising its powers under section 2 or 3 in relation to an individual course, a Faculty or Board of Studies shall consult the head of the department or school responsible for the course.

6. The Senate authorises the Faculty or Board of Studies as a whole or a Faculty Committee or Board of Studies Committee representing the main teaching departments in each Faculty or Board of Studies, to carry out all duties arising out of sections 1,2,3,4 and 5.

7. (1) Subject to section 7(2), a student who, having been excluded in accordance with these resolutions, has been refused enrolment or re-enrolment in any year or course by any Faculty or Board of Studies, or any Faculty Committee or Board of Studies Committee, may appeal to the Senate.

(2) A second or subsequent appeal to the Senate shall only be heard by leave of the Chancellor or the Deputy Chancellor.

A. Students in all Faculties and Boards of Studies

8. The Senate authorises any Faculty or Board of Studies to require a student to show good cause why he or she should be allowed to repeat in that Faculty or Board of Studies (a) a year of candidature in which he or she has failed or discontinued more than once or (b) any course in which he or she has failed or discontinued more than once whether that course was failed or discontinued when he or she was enrolled for a degree supervised by the Faculty or Board of Studies or by another Faculty or Board of Studies.

9. The Senate authorises the several Faculties or Boards of Studies to require a student who, because of failure or discontinuation has been excluded from a Faculty or course, either in the University of Sydney or in another tertiary institution, but who has subsequently been admitted or re-admitted to the University of Sydney to show good cause why he or she should be allowed to repeat either (a) the first year of attendance in which after such admission or readmissionhe or she fails or discontinues, or (b) any course in which in the first year after admission or readmission he or she fails or discontinues.

J. Faculty of Science

18. (1) The Senate authorises the Faculty of Science to require a student to show good cause why he or she should be allowed to re-ehrol in the degree of Bachelor of Science or Bachelor of Medical Science if in the opinion of the Faculty he or she has not made satisfactory progress towards fulfilling the requirements for the degree.

(2) Satisfactory progress cannot be denned in all cases in advance, but a student who has not gained credit for 116 or more units should be asked to show good cause why he or she should be allowed to re-enrol as a candidate for the degree of Bachelor of Science or Bachelor of Medical Science if in any two successive years of attendance he or she fails to gain credit for half the unit value of courses attempted, unless in one of these two years he or she successfully completes all courses attempted in that year.

(3) In cases where the Faculty, permits the re-enrolment of a student whose progress has been deemed unsatisfactory, the Faculty may require the completion of specified courses in a specified time, and if the student does not comply with these conditions, the student may again be called upon to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Science or Bachelor of Medical Science.

19. (1) The Senate authorises the Faculty of Science to require a student to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Pharmacy if in the opinion of the Faculty he or she has not made satisfactory progress towards fulfilling the requirements for the degree.

(2) Satisfactory progress cannot be defined in all cases in advance, but a student who has not gained credit for 116 or more units shall be asked to show good cause why he or she should be allowed to re-enrol as a candidate for the degree of Bachelor of Pharmacy, if in any two successive years of attendance he or she fails in the first of these years to gain credit for 28 units and then fails to gain a total of 44 units in the

two years of attendance, unless in one of these two years he or she successfully completes all courses attempted in that year.

(3) In cases where the Faculty permits the re-enrolment of a student whose progress has been deemed unsatisfactory, the Faculty may require the completion of specified courses in a specified time, and if the student does not comply with these conditions the student may again be called upon to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Pharmacy.

Degree of Bachelor of Science

Summary of requirements

The requirements for the degree are set out in the Senate resolutions which should be read by all intending candidates (see below). In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree contained in sections 4, 5, 6 and 9.

Progression towards the degree is by the accumulation of unit points, gained by completing a course.

To qualify for a degree you must gain credit for at least 140 units. Junior courses are worth 12 units. Intermediate courses are worth 24 (Combined), 20 (Long), 16 (Normal or Advanced) or 8 (Auxiliary/ Auxiliary Advanced or Introductory) units depending on the course selected. Senior courses are worth 24 units. For students enrolled in the combined BSc/LLB course, Intermediate and Senior Law courses are worth 6 units each.

The total of 140 units required for the degree must include:

- 24 units from a Senior course, not including History and Philosophy of Science 3
- 32 units from Intermediate courses, and
- a total of 72 units from Senior and Intermediate courses.

The following courses must be completed:

- Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), and
- two courses chosen from Biology 1 or Biology 1 (Advanced), Chemistry 1 or Chemistry 1 (Advanced), Computer Science 1 or Computer Science 1 (Advanced), Geography 1, Geology 1, Physics 1 or Physics 1 (Advanced) and Psychology 1, of which at least one shall be Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced).

Thus the basic sequence of courses must include Mathematics 1 (any option), Physics 1 (either option) or Chemistry 1 (either option), Intermediate courses worth 32 units and at least one Senior course.

There are the following constraints on enrolment in courses:

- Only those combinations of courses permitted by the timetable can be taken.
- Full-time students generally enrol in 4 Junior courses in the first year of attendance
- You may not enrol in courses worth more than 52 units total in any one year or the equivalent of 56 units in one semester without special permission of Faculty. You may not enrol in a Junior course unless you are enrolled in any corequisite course.
- You may not enrol in any Intermediate courses before you have completed 3 Junior courses.
- You may not enrol in a Senior course before you have completed 32 units of Intermediate courses.
- You may not enrol in Intermediate or Senior courses unless you have completed the prerequisite courses and are enrolled in any corequisite courses.

HSC Aggregate

The minimum Tertiary Entrance Rank for admission to the Faculty varies from year to year. This figure represents the lowest mark needed for entry, but you should not be deceived about the level of difficulty of the BSc degree course.

A quota will apply for entry into the BMedSc degree (at second year level), following regular enrolment for the BSc degree (at first year level).

Plans of courses

It is important when choosing courses at any stage of your university career that you should consider your overall degree program. *Consultation with a Faculty adviser is always recommended.*

Alternative structure of courses

It is possible to enrol in some courses without completing the usual prerequisites. In all cases permission must be obtained from the head of the department concerned.

Agricultural Chemistry 3

If you have not taken the course Agricultural Chemistry 2 but have completed Chemistry 2 *and* Biochemistry 2 or Biochemistry 2 Auxiliary, or Chemistry 2 Auxiliary *and* Biochemistry 2, you may be permitted to enrol in Agricultural Chemistry 3.

Biology Honours

If you have majored in Physics, Chemistry or Biochemistry and wish to study Biophysics or Plant Physiology you may be permitted to enrol in Biology Honours without having completed Biology 2 and 3.

Computer Science 2

If you have not completed Mathematics 1 or Mathematics 1 (Advanced) but have completed Mathematics 1 (Life Sciences) at credit standard, you may apply for permission to enrol in Computer Science.

Geography 2

If you have completed a Junior Mathematics course and either Chemistry 1 [or Chemistry 1 (Advanced)], Physics 1 [or Physics 1 (Advanced)] you may enrol in Geography 2 without completing Geography 1, with the permission of the Head of Department.

8-unit courses

If you are planning to enrol in two or more 8-unit courses you should be aware that, because of the distribution of your workload, two 8-unit courses can in fact place greater demands on your time and effort than one Normal 16-unit course. (Also see under 'Selection of courses...' at the end of Chapter 2.)

Special permission

You should note that the Faculty can, in certain instances, permit exceptions to the normal requirements for a degree. Applications for special consideration should be made in writing to the Registrar after discussion with the Secretary to the Faculty.

Part-time candidature

It is expected that the majority of candidates will proceed as full-time students. If, however, you are unable to proceed on a full-time basis you may enrol as a part-time candidate and willbe required to indicate this when enrolling. Day-time attendance at lectures and laboratory classes is required for most science courses.

Part-time candidates during their first year of attendance enrol in one or two Junior courses. Candidates enrolling in one Junior course will be required to enrol in one of Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced). Candidates enrolling in two Junior courses will be required to enrol in at least one of the courses Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced), and if only one of these courses is taken then one further course will be required to be chosen from Group A. Part-time candidates who do not take a Junior course in Mathematics during their first year of attendance will be required to take such a course in the next year of attendance

Discontinuation

For regulations relating to discontinuation, see the University's *Statutes and Regulations 1994-95.* Students should read these regulations carefully as a discontinuation can affect the Weighted Average Mark (WAM). For further information about the WAM, see under "Honours courses'below.

Regulations

Resolutions of the Senate[1]

The following resolutions governing candidature for the degree of Bachelor of Science have been prescribed by the Senate.

1. For the purpose of the resolutions:

(1) (i) A *course* shall consist of lectures together withsuchtutorialinstruction, essays, exercises, or practical work as may be prescribed,

(ii) Each course shall be designated as a *Junior* course, a *Junior Advanced* course, an *Intermediate* course, a *Senior* course, a *Senior Advanced* course, a *Senior Additional* course or an *Honours* course. Each Intermediate course shall be designated as *Normal, Normal Advanced, Auxiliary, Auxiliary Advanced, Introductory, Long, Combined* or *Combined Advanced.*

(iii) Except as provided in section 8(1) or section 12, candidates who have completed a course shall have units credited towards the completion of a degree in accordance with the following:

Junior course	12 units
Junior Advanced course	12 units
Intermediate courses—	
Normal	16 units
Normal Advanced	16 units
Auxiliary	8 units
Auxiliary Advanced	8 units
Introductory	8 units
Long	20 units
Combined	24 units
Combined Advanced	24 units
Senior course	24 units
Senior Additional course	24 units
Senior Advanced course	24 units

(iv) Junior, Intermediate, Senior or Honours courses are indicated by the Arabic numeral 1, 2, 3, or 4 respectively placed immediately after the name of a subject.

(2) To *'complete a course'* and derivative expressions mean:

(i) to attend the lectures and the meetings, if any, for tutorial instructions;

(ii) to complete satisfactorily the essays, exercises and the practical work, if any; and

(iii) to pass the examinations of the course.

(3) A *qualifying course* means a course which must be completed with a result of Pass or better (not Terminating Pass)[2] before the course for which it qualifies may be taken.

(4) AprereguisitecoMrsemeansacourseother than a qualifying course in a subject which, except with the permission of the head of the department concerned, must have been completed prior to a candidate taking a course for which the Faculty has declared it to be a prerequisite.

(5) A *corequisite course* means a course which unless previously completed must, except with the permission of the head of department concerned, be taken concurrently with the course for which the Faculty has declared it to be a corequisite.

Grades of Award

2. The degree shall be awarded in two grades, namely the Pass degree and the Honours degree.

'From 1994 the course General Pure Mathematics 1 has been renamed Mathematics 1 (Life Sciences). Any reference to Mathematics 1 (Life Sciences) in these Resolutions shall he deemed to apply equally to General Pure Mathematics 1.

[2]See Section 10(7).

Courses for Pass degree

3. Courses for the degree shall, except as provided in section 7 and section 12:

(1) be in such subjects,

(2) have such unit values, and

(3) have such qualifying, prerequisite and corequisite courses as are set out in the table associated with this section.

Qualification for Pass degree

4. Candidates for the pass degree shall:

(1) complete—

(i) either Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences); and

(ii) two courses chosen from Biology 1 or Biology 1 (Advanced), Chemistry 1 or Chemistry 1 (Advanced), Computer Science 1 or Computer Science 1 (Advanced), Geography 1, Geology 1, Physics 1 or Physics 1 (Advanced) and Psychology 1, of which at least one shall be Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced).

(2) gain credit totalling at least 140 units of which:

(i) at least 72 shall be units for Senior and Intermediate Courses;

(ii) at least 24 shall be units for Senior Courses *not* including History and Philosophy of Science 3;

(iii) at least 32 shall be units for Intermediate (Normal, Normal Advanced, Long, Combined or Combined Advanced) courses, provided that the Faculty may permit—

(a) a candidate who passes two Senior courses, a prerequisite for one of which is an Intermediate 8-unit course, to count that Intermediate 8-unit course along with another Intermediate 8-unit course as together constituting an equivalent Intermediate Normal course.

(b) a candidate to count as equivalent to an Intermediate Normal course a combination of 8-unit courses approved for this purpose and designated accordingly in the table accompanying section 3.

(iv) not more than 24 units shall be credited towards the degree from courses selected from Group B of section 5 and courses other than those specified in the table accompanying section 3;

(v) not more than 12 units shall be credited towards the degree from courses in Group B of section 5 which are designated B101 or AB101;

(vi) not more than 32 units shall be derivedfromfntermediatecourses in Biology or more than 48 units derived from Senior or Senior Additional courses in Biology; and

(vii) not more than 28 units, obtained from not more than two whole courses, shall be credited from courses in which terminating passes have been awarded.

(3) not have any course credited more than once for the degree.

(4) not have credited for the degree units derived from more than one of such courses as the Faculty may deem to be mutually exclusive[1] except as provided in section 8 (1).

(5) whenenrolledinacourse,anon-optional part of which is similar in content to part of (i) a course previously completed or (ii) another course in which the candidate is currently enrolled, complete an equivalent amount of alternative work, as directed by the head(s) of department(s) concerned, in order to complete the course.

(6) not take an option within a course which is similar in content to part of a course concurrently being taken or previously completed.

Enrolment in Junior courses

5. (1) In their first year of attendance, unless granted credit in accordance with section 11, candidates for the Pass degree shall:

if undertaking four Junior courses enrol in—

(i) Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences);

(ii) at least one of the courses Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced);

(iii) in the case of students enrolling in both Chemistry 1 or Chemistry 1 (Advanced) and Physics 1 or Physics 1 (Advanced), one further course from either Group A or Group B; otherwise in two further courses, atleastone of whichmust be from Group A.

if undertaking three Junior courses enrol in—

(i) Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences);

(ii) at least one of the courses Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced);

(iii) in the case of students notenrolling in both Chemistry 1 [or Chemistry 1 (Advanced)] and Physics 1 [or Physics 1 (Advanced)], one further course chosen from either Group A or Group B.

[1]See column (d) in the Table following these resolutions for information about courses deemed to be mutually exclusive.

if undertaking two Junior courses enrol in—

(i) at least one of the courses Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced);

(ii) in the case of students enrolling in only one of the courses Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced), one further course chosen from Group A.

if undertaking one Junior course enrol in one of—

Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), Chemistry 1[3], Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced).

Group A
Biology 1 or Biology 1 (Advanced)
Chemistry 1 or Chemistry 1 (Advanced)
Computer Science 1 or Computer Science 1 (Advanced)
Geography 1
Geology 1
Physics 1 or Physics 1 (Advanced)
Psychology 1

Group B

Comprises all first year courses offered by the Faculties of Arts and Economics not listed by name in the table of courses associated with section 3 of these resolutions but excluding those courses which the Faculty has deemed to be mutually exclusive[1] with courses offered for the Bachelor of Science degree.

(2) In any year of enrolment subsequent to the first year candidates who have not met the requirements specified in section 6(l)(i) for enrolment in an Intermediate course may not enrol in Group A courses other than Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced), or in Group B courses, unless they have passed, have been granted credit in accordance with section 11 for, or are currently enrolled in Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences) and at least one of the courses Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced).

(3) In selecting a course from Group B candidates shall be required to comply with section 6(6) of these resolutions as well as those of the Faculties of Arts and Economics inrespect to the course.

Restrictions on enrolment

6. (1) Except with the permission of the Faculty, candidates may not take an Intermediate course:

(i) until they have completed at least three Junior courses, of which one must be Physics 1 or Physics 1 (Advanced), Chemistry 1 or Chemistry 1 (Advanced), Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences).

(ii) until they have completed the Junior courses, if any, prescribed by the Faculty as prerequisites for the Intermediate course as set out in section 3.

(2) Except with the permission of the Faculty, candidates may not take a Senior course:

(i) until they have gained creditfor at least 32 units in Intermediate courses.

(ii) until they have completed at least two of the courses Physics 1 or Physics 1 (Advanced), Chemistry 1 or Chemistry 1 (Advanced), Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences).

(iii) until they have completed the Intermediate and Junior courses, if any, prescribed by the Faculty as prerequisites for the Senior course as set out in section 3.

(3) Candidates may not take the Senior Additional Course in a subject except with the permission of the head of department concerned, and then only concurrently with the coexisting Senior course in the same subject, unless that Senior course has been completed previously.

(4) Except with the permission of the Faculty, candidates may not take any higher course in any subject without having previously completed the lower course or courses in the same subject or some other course or courses allowed by the Faculty to count as equivalent. For the purposes of this subsection candidates who completed an Intermediate Auxiliary course do not thereby qualify to take the Senior course in that subject; candidates who complete the Intermediate Introductory course ina subject may, subject to the conditions of subsection (2), take the Senior course in that subject.

(5) ExceptwiththepermissionoftheFaculty, candidates may not take in any one academic year more than four courses, or courses with a total number of units in excess of 52 or in excess of the equivalent of 56 in one semester.

(6) The choice of courses made by candidates shall be limited by the exigencies of the timetable provided that candidates who have completed at least three Junior courses and who seek to enrol in two courses which are given wholly or partly at the same hour or hours may be granted, by the heads of the departments concerned, permission to attend equivalent courses or parts of courses given at another hour or other hours.

[3]See column (d) in the Table following these resolutions for information about courses deemed to be mutually exclusive.

Enrolment in courses not in the table

7. (1) A candidate of merit may, under special circumstances and with the permission of the faculty, enrol in a course other than those specified in the table accompanying section 3 provided that course is of a standard at least equivalent to an Intermediate Normal course. A student on completion of any such course will only have 12 units counted, as Junior units, towards the 140 units that are required by the Bachelor of Science degree, irrespective of the unit value assigned to that course by the Faculty in which it is given.

(2) A candidate of exceptional merit may, under special circumstances and with the permission of the Dean, undertake studies within the Faculty other than those courses specified in the table accompanying section 3, and upon completion of those studies have them counted towards the degree. The candidate may be given credit for these studies of up to 40 units, which will be designated by the Dean as Junior, Intermediate, Senior or Senior Additional. Such units shall count towards the number of units required for the degree in accordance with section 4(2).

Upgrade of courses

8. (1) Candidates who have completed the Intermediate Auxiliary, Auxiliary Advanced or Normal or Normal Advanced course in a subject and who subsequently complete the Normal, Normal Advanced, Long, Combined or Combined Advanced course in that subject will be credited with the appropriate additional unit value.

(2) Candidates who have been awarded a Terminating Pass in any course may take that course again. On completion of this course such candidates will not be credited with any further units unless the course is completed at least at Pass level and the units had not previously, been credited in accordance with section 4(2)vii which limits the number of units which shall be credited from courses in which Terminating Passes have been awarded.

Part-time study

9. (1) Candidates who in any year intend to proceed towards the degree of Bachelor of Science as part-time students shall indicate this intention when enrolling.

(2) Candidates proceeding as part-time students shall not take in any one academic year more than three courses, or courses with a total unit value of 36 or more.

Course assessment

10. (1) Candidates may be tested by written and oral class examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.

(2) In all courses passes may be graded into High Distinction, Distinction, Credit and Pass, and in Junior and Intermediate courses Terminating Pass. The grades High Distinction, Distinction or Creditindicate work of a standard higher than that required for a pass.

(3) Where a department offers a course at two levels the performance of students in the two levels in terms of comparability of quality of work will be matched by that department so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade obtained at the other level.

(4) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Faculty Board of Examiners shall determine.

(5) Candidates who do not pass in a course shall, unless exempted by the Dean, again a ttend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to re-enrol.

(6) Candidates who repeat any course shall not be eligible for any prize or scholarship awarded in connection with the examination for such a course.

(7) In any Junior or Intermediate course the Faculty Board of Examiners may award a Terminating Pass which, subject to the provisions of section 4(2) (vii), entitles the Candida te to be credited with the full number of units for that course. Candidates who have been awarded a Terminating Pass in a course are not thereby qualified to take a higher course in that subject, but otherwise such candidates shall be held to have completed such course.

Credit for courses

11. (1) Candidates who have previously completed studies which are considered by the Faculty to be equivalent to any course listed in the tables associated with section 3 or section 12 may be given credit for that course providing that:

(i) the total unit-value of the courses so credited from studies which have resulted in the conferring of a degree or degrees may not exceed 52.

(ii) in the case of students who have completed courses in another tertiary program without the degree being conferred and who have abandoned credit in that program for the courses on the basis of which credit is sought, any number of courses may be credited.

(2) Candidates who have been given credit for courses listed in the tables, in accordance with section 11(1), shall be regarded as having completed such courses for the purposes of these resolutions.

(3) Candidates for the degree who have completed studies at tertiary level which are considered by the Faculty to be appropriate, but for which there is no equivalent course listed in the table associated with section 3, may be given credit for such number of units, to be designated by the Faculty as Junior, Intermediate, Senior or Senior Additional, as the Faculty may determine. Such units shall count towards the number of units required for the degree in accordance with section 4(2).

Science/Law

12. (1) Notwithstanding the resolutions of the Senate relating to degrees in more than one Faculty and subject to sections 4 and 5 of these resolutions, a person may proceed concurrently as a candidate for the degrees of Bachelor of Science and Bachelor of Laws and may receive credit for up to 42 units in respect of the courses set out in the table associated with this section for the Bachelor of Science degree, provided that:

(i) such a candidate may not, except with the express permission of the Deans of the Faculties of Science and Law, enrol in courses of a total unit value exceeding that specified in section 6(5);

(ii) no courses listed in Group B of section 5 of these resolutions or courses not listed in the Table accompanying section 3 of these resolutions may be credited towards the BSc degree;

(iii) such a candidate may not use any Law course to satisfy the requirementinsection4(2) of these resolutions that at least 72 of the total of 140 units required to qualify for the Pass degree shall be units for Senior and Intermediate courses.

(2) Except with the permission of the Faculty of Law, a candidate may not take any of the Intermediate or Senior courses in the Table of Law courses until they have completed the course Legal Institutions.

Science/Engineering

13. Notwithstanding the resolutions of the Senate relating to degrees in more than one Faculty or any other of these resolutions, students who have completed studies in the Faculty of Engineering may be admitted by the Faculty of Science to candidature for the degree. Such students shall comply with such requirements for the degree as may be prescribed by the resolutions of the Senate and by resolution of the Faculty.[1]

'See the section 'Combined Science/Engineering' later in this chapter of the handbook, and Faculty resolutions in the *Statutes and Regulations 1994-95.*

Science/Medicine, Arts/Science

14. Notwithstanding the resolutions of the Senate relating to degrees in more than one faculty or any other of these resolutions, a person may proceed concurrently as a candidate for the degrees of:

(i) Bachelor of Science, Bachelor of Medicine and Bachelor of Surgery; or

(ii) Bachelor of Arts and Bachelor of Science.

Such students shall comply with such requirements foreachdegreeas may be prescribed by the resolu tions of the Senate and by resolution of the Faculties.

Admission to Honours courses

15. (1) In order to qualify for admission to an Honours course candidates shall have qualified for the award of a Pass degree and be considered by the Faculty and the head of the department concerned to have the requisite knowledge and aptitude for an Honours course.

(2) With the permission of the appropriate head of department and provided the requirements in subsection (1) have been satisfied the following may also be admitted to Honours courses:

(i) Pass graduates in Science of the Faculty of Science.

(ii) Pass graduates holding Bachelor of Science degrees or equivalent from such other institutions as the Faculty may from time to time determine.

(3) Candidates may not take more than one Honours course in any one academic year.

(4) Candidates who have qualified for the Honours degree may take, in the next year or at such later times as the Faculty permits, an additional Honours course which they are qualified to enter.

Honours courses

16. (1) Candidates for the Honours degree shall complete an Honours course.

(2) There shall be an Honours course in the following subjects: Agricultural Chemistry, Anatomy, Applied Mathematics, Biochemistry, Biology, Cell Pathology, Computer Science, Geography, Geology, Geomorphology with Geography, Geophysics, Histology, Inorganic Chemistry, Marine Sciences, Mathematical Statistics, Microbiology, Organic Chemistry, Pharmacology, Physical Chemistry, Physics, Physiology, Psychology, Pure Mathematics, Soil Science, Theoretical Chemistry.

Classes of Honours and Medal

17. (1) There shall be three Classes of Honours, namely Class I, Class II and Class HI, and within Class II there shall be two Divisions, namely Division 1 and Division 2.

(2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.

(3) There shall be no re-examination for Honours.

Honours courses

The regulations governing Honours courses in the Faculty of Science are sections 15-17 (BSc), 9-11 (BPharm and BMedSc) of the Senate resolutions. You should note particularly section 9 (BPharm and BMedSc) or 15 (BSc) and that approval both from Faculty and the head of the department concerned is required. To obtain permission from the Faculty, applicants must (i) have gained a credit in the Senior course relating to the intended Honours subject or have a WAM of at least 58 (see below); and (ii) be of no t more than four years' standing, or in the case of part-time students, of not more than five years' standing as students in the Faculty at the time requirements for the Pass degree are completed. Exceptions are granted only on the grounds of documented illness or misadventure. Note also that heads of department may apply additional guidelines. (Applications for advice of WAM may be lodged at the Faculty Office.)

In the case of students applying under section 15(2)(ii) of the Senate resolutions for the degree of Bachelor of Science or section 9(2)(ii) of the Senate resolutions for the degree of Bachelor of Pharmacy, the Dean, on behalf of the Faculty, shall be responsible for determining whether students may be admitted to an Honours course by assessing whether the overall performance of each applicant is comparable to pass graduates of the Faculty of Science eligible for admission to an Honours course.

It is usual for students to take the same subject in Honours that they have taken at the Senior level. Permission can, however, be given by the Faculty for taking an Honours course without having taken the Senior course when previous training is suitable. For example, it is permissible to study Biophysics in Biology 4 without having taken Biology 2 and 3 if Physics or Physical Chemistry have been takeninstead. Similarly Honours in Geophysics may be taken in certain circumstances without having taken Geology 3. .

Where an Honours course differs from the previous specialisation, the head of the appropriate department and the Faculty of Science must be satisfied that previous training is adequate.

Award of Honours and ranking for postgraduate scholarships

The Faculty has adopted a system of Weighted Average Marks (WAM) in relation to the award of Honours and ranking for postgraduate scholarships. The WAM is an integer between 45 and 100 which is an overall measure of performance in the pre-honours years. Itis calculated by summing the products of the marks achieved and the weighted unit values of the courses taken in the pre-honours years and then dividing by the sum of the weighted unit values. Note that *all* attempts at courses are included in the calculation *except where courses are discontinued with permission.*

The formula used is as follows:

$$WAM = \frac{\Sigma WcMc}{\Sigma Wc}$$

where Wc is the weighted unit value—i.e. unit value x year weighting of 1 (Junior), 2 (Intermediate) or 3 (Senior)—and Mc is the greater of 45 or the mark out of 100 for the course.

The Faculty is aware that, because the Honours year in some departments is wholly or predominantly formal course work and in others a research project, and because some subjects are not taught until well into the undergraduate program, the way in which departments take cognisance of performance in the pre-honours years in arriving at a recommendation for a grade of Honours must be left to their discretion. However, the Faculty has established a set of guidelines for departments to use in determining their recommendations.

The Faculty stipulates that a student with a WAM of less than 80 or an Honours year mark of less than 95 would not normally receive a medal. A student with a WAM of 77 to 79 inclusive may be considered for the award of a medal only if it can be demonstrated that the WAM was affected by sickness, misadventure, unusual workload or choice of courses. The Faculty recognises, however, that the Senate resolutions concerning medals relate the award of a medal to the Honours courses only.

The Faculty also stipulates that a student with a WAM of less than 68 *or* an Honours year mark of less than 80 would receive first class honours only in exceptional circumstances. Students who have a WAM within the range of 65 to 67 and who obtain a combined mark of 148 or greater (WAM plus fourth year mark) may be considered for the award of first class honours only if it can be demonstrated that their WAM was affected by sickness, misadventure, unusual work load or choice of courses, *and/or* they can demonstrate exceptional performance in their Honours year.

The award of second and third class Honours is made on the basis of the Honours year mark only. A student who fails the Honours year is recorded Tail' in that year and is awarded a pass degree.

Ranking for postgraduate scholarships is determined by the sum of the WAM and the Honours year mark.

Table: [see section 3]

(a) **Courses**	*(b)* **Unit values**	*(c)* **Assumed standard of knowledge at Higher School Certificate examination or equivalent level (as approved by the Senate**	*(d)* **Corequisites** (C)	*(e)* **Additional information about courses**
A. Junior courses				
Biology 1	12	The Biology section of the Science 3-unit course		See prerequisites for Intermediate and Senior courses in Biology. May not be counted with Biology 1 (Advanced)
Biology 1 (Advanced)	**12**	The Biology section of the Science 3-unit course		Students must first enrol in Biology 1. Subsequently, selected students maybe invited toenrolinthis course where they will participate in a more demanding alternative component of the Biology 1 course in Second Semester. See prerequisites for Intermediate and Senior courses in Biology. May not be counted with Biology 1
Chemistry 1	12	Mathematics 2-unit course and the Chemistry section of the Science 3-unit or 4-unit course or 2-unit Chemisuyt		See prerequisites for Chemistry 2. Recommended concurrent course: Mathematics 1 or Mathematics 1 (Advanced). May not be counted with Chemistry 1 (Advanced)
Chemistry 1 (Advanced)	12	Mathematics 2-unit course and the Chemistry section of the Science 3-unit or 4-unit course or 2-unit Chemistryt		See prerequisites for Chemistry 2. Recommended concurrent course: Mathematics 1 or Mathematics 1 (Advanced). May not be counted with Chemistry 1
Computer Science 1	12	Mathematics 3-unit course	**C:** Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	See prerequisites for Intermediate and Senior courses in Computer Science. May not be counted with Computer Science 1 (Advanced)
Computer Science 1 (Advanced)	**12**	Mathematics 3-unit course	C: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	Students must first enrol in Computer Science 1. Selected students will be invited to take part in challenge work. Students who undertake sufficient challenge work at a high standard will have their enrolment changed to Computer Science 1 (Advanced). May not be counted with Computer Science 1
Geography 1	12			
Geology 1	12	No previous knowledge of Geology assumed		See prerequisites for Geology 2
Mathematics 1	12	Mathematics 3-unit course		May not be counted with Mathematics 1 (Life Sciences) or Mathematics 1 (Advanced)
Mathematics 1 (Advanced)	12	Mathematics 3-unit course		May not be counted with Mathematics 1 (Life Sciences) or Mathematics 1
Mathematics 1 (Life Sciences)	12	Mathematics 2-unit courset	!	For candidates who undertake Mathematics 1 (Life Sciences) there are restrictions on entry to

(a) Courses	(b) Unit values	(c) Assumed standard of knowledge at Higher School Certificate examination or equivalent level (as approved by the Senate	(d) Corequisites (C)	(e) Additional information about courses
Mathematics 1 (Life Sciences) *(continued)*				all Intermediate Mathematics and Statistics courses except Statistical Methods 2. See the Intermediate course entries in this table for details. Prior to 1994 this course was called General Pure Mathematics 1
Physics 1	**12**	Regular Strand: Mathematics 2-unit course and the Physics section of the Science 3-unit or 4-unit course or 2-unit Physics Fundamental Strand: (First Semester) Mathematics 2-unit course	C: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	See prerequisites for Physics 2 and Physics 3. May not be counted with Physics 1 (Advanced)
Physics 1 (Advanced)	**12**	Mathematics 3-unit course and the Physics section of the Science 3-unit or 4-unit course or 2-unit Physics	C: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	See prerequisites for Physics 2 and Physics 3. Students with TERs of less than 95 or 2-unit Physics scores of less than 90 should enrol in Physics 1 instead. May notbe counted with Physics 1
Psychology **1**	**12**			
Group B Courses Comprises all First Year courses offered by the Faculties of Arts and Economics not listed by name in this table of courses but excluding those courses which the Faculty has deemed to be mutually exclusive.	**12**			Students should consult the Handbooks for the Faculties of Arts and Economics to determine any prerequisites, corequisites or other requirements relating to enrolment in courses offered by departments in these faculties. Students must enrol in a course, or combination of related courses, equivalent to one full-year Junior Science course. Related courses which together are equivalent to one full-year Junior Science course must all be passed before any credit can be granted. Students may not enrol in Econometrics 1 (deemed to be mutually exclusive with all Junior Mathematics courses)

† Candidates who have not achieved this assumed standard will be required to undertake supplementary work, details of which can be obtained from the School.
*At the time of publication of the 1995 Faculty of Science Handbook, items marked with an asterisk had not been formally approved by the University. Students will be informed **at** enrolment if any of these courses are not applicable.

(a) Courses	(b) Unit values	(c) Qualifying courses (Q) Prerequisites (P) Corequisites (C)	(d) Faculty of Science resolutions governing courses	(e) Additional information about courses
B. Intermediate courses (1) Normal				
Agricultural Chemistry 2	**16**	**Q:** Chemistry 1 or Chemistry 1 (Advanced)	Students obtaining a T' pass in Chemistry 1 may apply under section 6(4) for admission. May not be counted with any Intermediate course in Biochemistry	Faculty is unlikely to consider requests made under section 6(4) unless satisfactory results have been gained in the other three Junior subjects
Applied Mathematics 2	**16**	Q: Mathematics 1 or Mathematics 1 (Advanced)	A candidate who has passed Mathematics 1 (Life Sciences) at	

(a) Courses	(b) Unit values	(c) Qualifying courses (Q) Prerequisites (P) Corequisites (C)	(d) Faculty of Science resolutions governing courses	(e) Additional information about courses
Applied Mathematics 2 *(continued)*			distinction standard may enrol in Applied Mathematics 2. A candidate who has passed Mathematics 1 (Life Sciences) at credit standard may apply for permission to enrol in Applied Mathematics 2. May not be counted with Applied Mathematics 2 (Advanced) or Mathematical Methods 2	
Applied Mathematics 2 (Advanced)	16	Q: Mathematics 1 or Mathematics 1 (Advanced)	May not be counted with Applied Mathematics 2 or Mathematical Methods 2	
Biochemistry 2	16	Q: Chemistry 1 or Chemistry 1 (Advanced)	May not be counted with Agricultural Chemistry 2	
Biology 2 (Animals)	16	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) and one of Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	May not be counted with either Biology 2 (Animals) (Advanced) or Biology 2 (Animals — Theory) Auxiliary	See prerequisites for Senior courses in Biology[1]
Biology 2 (Animals) (Advanced)	16	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) and one of Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	May not be counted with either Biology 2 (Animals) or Biology 2 (Animals — Theory) Auxiliary	Students must first enrol in Biology 2 (Animals). Subsequently, selected students may be invited to enrol in this course where they will participate in alternative components of Biology 2 (Animals). See prerequisites for Senior courses in Biology'
Biology 2	16		Certain combinations of 8 unit Introductory and Auxiliary courses may also be counted as equivalent to Intermediate Normal courses in accordance with section 4(2)(iii)Cb). (See the Introductory and Auxiliary courses in this table for details)	See prerequisites for Senior courses in Biology[1]
Chemical Engineering Science 2	16	P: Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) C: Chemistry 2 or Chemistry 2 Long	May not be counted with either Civil Engineering Science 2 or Mechanical and Aeronautical Engineering Science 2	
Chemistry 2	16	Q: Chemistry 1 or Chemistry 1 (Advanced) P: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	May not be counted with either Chemistry 2 Long or Chemistry 2 Auxiliary	

'Note that no more than 32 units of Intermediate courses in Biology may be counted.

(a) Courses	*(b)* Unit values	*(c)* Qualifying courses (Q) Prerequisites (P) Corequisites (C)	*(d)* Faculty of Science resolutions governing courses	*(e)* Additional information about courses
Civil Engineering Science 2	16	P: Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced)	May not be counted with either Chemical Engineering Science 2 or Mechanical and Aeronautical Engineering Science 2	
Computer Science 2	16	Q: Computer Science 1 or Computer Science 1 (Advanced) P: Mathematics 1 or Mathematics 1 (Advanced)	A candidate who has passed the course Mathematics 1 (Life Sciences) at credit standard may apply for permission to enrol in Computer Science 2	See prerequisites for Computer Science 3
Geography 2 (Human)	12	Q: Geography 1 [but see column *(d)]*	A candidate who has completed a Junior course in Mathematics and at least one of Physics 1 or Physics 1 (Advanced) or Chemistry 1 or Chemistry 1 (Advanced) and who has not taken Geography 1 may apply under section 6(4) for permission to enrol in one of Geography 2 (Human), Geography 2 (Environmental) or Geography 2 (Geomorphology)	The Department of Geography is not normally prepared to support applications under section 6(4) to enrol in Geography 2 (Human) from persons other than those who, in their first year of studies, have completed four Junior courses above the terminating pass grade and have not subsequently failed in any Intermediate courses. Students are permitted to count only one Intermediate Geography course towards the BSc degree.
Geography 2 (Environmental)	12	Q: Geography 1 [but see column *(d)]*	A candidate who has completed a Junior course in Mathematics and at least one of Physics 1 or Physics 1 (Advanced) or Chemistry 1 or Chemistry 1 (Advanced) and who has not taken Geography 1 may apply under section 6(4) for permission to enrol in one of Geography 2 (Human), Geography 2 (Environmental) or Geography 2 (Geomorphology)	The Department of Geography is not normally prepared to support applications under section 6(4) to enrol in Geography 2 (Environmental) from persons other than those who, in their first year of studies, have completed four Junior courses above the terminating pass grade and have not subsequently failed in any Intermediate courses. Students are permitted to count only one Intermediate Geography course towards the BSc degree.
Geography 2 (Geomorphology)	12	*Q:* Geography 1 [but see column *(d)]*	A candidate who has completed a Junior course in Mathematics and at least one of Physics 1 or Physics 1 (Advanced) or Chemistry 1 or Chemistry 1 (Advanced) and who has not taken Geography 1 may apply under section 6(4) for permission to enrol in one of Geography 2 (Human), Geography 2 (Environmental) or Geography 2 (Geomorphology)	The Department of Geography is not normally prepared to support applications under section 6(4) to enrol in Geography 2 (Geomorphology) from persons other than those who, in their first year of studies, have completed four Junior courses above the terminating pass grade and have not subsequently failed in any Intermediate courses. Students are permitted to count only one Intermediate Geography course towards the BSc degree.
Geology 2	16	Q: Geology 1	A candidate who has completed Junior courses in Physics and Chemistry and who has not taken Geology 1, may apply under section 6(4) for permission to enrol in Geology 2	

(a) **Courses**	*(b)* **Unit values**	*(c)* **Qualifying courses (Q) Prerequisites (P) Corequisites (C)**	*(d)* **Faculty of Science resolutions governing courses**	*(e)* **Additional information about courses**
Mathematical Statistics 2	**16**	**Q:** Mathematics 1 or Mathematics 1 (Advanced) [but see column *(d)]*	A candidate who has passed Mathematics 1 (Life Sciences) at credit standard may enrol in Mathematical Statistics 2. A candidate who has passed Mathematics 1 . (Life Sciences) but who has not gained a credit must, if wishing to enrol in Mathematical Statistics 2, consult the Head of School. May not be counted with Mathematical Statistics 2 (Advanced) or Statistical Methods 2	See prerequisites for Mathematical Statistics 3
Mathematical Statistics 2 (Advanced)	**16**	Q: Mathematics 1 or Mathematics 1 (Advanced)	May not be counted with Mathematical Statistics 2 or Statistical Methods 2	See prerequisites for Mathematical Statistics 3
Mechanical and Aeronautical Engineering Science 2	**16**	P: Physics 1 or Physics 1 (Advanced) and Mathematics 1 or Mathematics 1 (Advanced)	May not be counted together with either Chemical Engineering Science 2 or Civil Engineering Science 2	
Microbiology 2	**16**	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced)	May not be counted with Microbiology 2 (Advanced)	
Microbiology 2 (Advanced)	**16**	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced)	May not be counted with Microbiology 2	
Physics 2	**16**	Q: Physics 1 or Physics 1 (Advanced) P: Mathematics 1 or Mathematics 1 (Advanced)	A candidate who has passed the course Physics 1 (Life Sciences) at credit standard or better and who has passed the course Mathematics 1 or Mathematics 1 (Advanced) may enrol in the course Physics 2. A candidate who has passed the course Physics 1 (Life Sciences) at credit standard or better and who has passed the course Mathematics 1 (Life Sciences) at credit standard or better may apply for permission to enrol in the course Physics 2	See prerequisites for Physics 3
Psychology 2	**16**	Q: Psychology 1		
Pure Mathematics 2	**16**	Q: Mathematics 1 or Mathematics 1 (Advanced)	A candidate who has passed Mathematics 1 (Life Sciences) at distinction standard may enrol in Pure Mathematics 2. A candidate who has passed Mathematics 1 (Life Sciences) at credit standard may apply for permission to enrol in Pure Mathematics 2. May not be counted with Pure Mathematics 2 (Advanced) or Mathematical Methods 2	

(a) Courses	*(b)* Unit values	(c) Qualifying courses (Q) : Prerequisites (P) Corequisites (C)	*(d)* Faculty of Science resolutions governing courses	*(e)* Additional information about courses
Pure Mathematics 2 (Advanced)	16	Q: Mathematics 1 or Mathematics 1 (Advanced)	May not be counted with Pure Mathematics 2 or Mathematical Methods 2	
Soil Science 2	16	P: Chemistry 1 or Chemistry 1 (Advanced) P: Physics 1 or Physics 1 (Advanced) or Physics 1 (Life Sciences) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences) or Computer Science 1 or Computer Science 1 (Advanced)		Students should note that if they enrol in Geography 3 subsequent to completing this course they will not be permitted to choose the to choose the Pedogeomorphology option
(2) Combined and Long				
Chemistry 2 Long	20	Q: Chemistry 1 or Chemistry 1 (Advanced) P: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)		
Mathematics 2 Combined	24	Q: Mathematics 1 or Mathematics 1 (Advanced)	This course comprises Mathematical Methods 2 and other options selected from those available for Pure Mathematics *2,* Pure Mathematics 2 (Advanced) and Applied Mathematics 2 or Applied Mathematics 2 (Advanced). A candidate who has passed Mathematics 1 (Life Sciences) at distinction standard may enrol in Mathematics 2 Combined. A candidate who has passed Mathematics 1 (Life Sciences) at credit standard may apply for permission to enrol in Mathematics 2 Combined. May not be counted with Mathematics 2 Combined (Advanced) or Applied Mathematics 2 (Advanced) or Applied Mathematics or Mathematical Methods 2 or Pure Mathematics 2 (Advanced) or Pure Mathematics 2	
Mathematics 2 Combined (Advanced)	24	Q: Mathematics 1 or Mathematics 1 (Advanced)	This course comprises Mathematical Methods 2 and other options selected from those available for Pure Mathematics 2 or Pure Mathematics 2 Advanced) and Applied Mathematics 2 or Applied Mathematics 2 (Advanced). May not be counted with Mathematics 2 Combined or Applied Mathematics 2 or Applied Mathematics 2 (Advanced) or Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Mathematical Methods 2	

(a) **Courses**	*(b)* **Unit values**	*(c)* **Qualifying courses (Q) Prerequisites (P) Corequisites (C)**	*(d)* **Faculty of Science resolutions governing courses**	*(e)* **Additional information about courses**
(3) Introductory	See note at the foot of-the next page for classification of 8-unit courses			
Entomology 2 Introductory	8	**Q:** Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) C: Biology 2 (Animals) or Biology 2 (Animals) Advanced		Class S2. This course will count as 8 of the maximum of 32 units of Intermediate Biology available to a candidate for the degree
History and Philosophy of Science 2 Introductory	8			Class A. This is the qualifying course for History and Philosophy of Science 3 .
Marine Sciences 2 Introductory	8			Class A. This is the qualifying , course for Marine Sciences 3. SomeoptionsinMarineSciences 3 have additional prerequisites. Students should consider these when entering Marine Sciences 2 Introductory
Pharmacology 2 Introductory	8	P: Chemistry 1 or Chemistry 1 (Advanced)		Class A. This is the qualifying course for Pharmacology 3. Students are strongly advised to complete Biology 1 or Biology 1 (Advanced) before enrolling in Pharmacology 2 Introductory
(4) Auxiliary	See note at the foot of next page for classification of 8-unit courses			
Biochemistry 2 Auxiliary	8	Q: Chemistry 1 or Chemistry 1 (Advanced)	May not be counted with Agricultural Chemistry 2	Class A. Terminating course
Biology 2 (Plant Anatomy and Physiology) Auxiliary	8	Q: Biology 1 or Biology 1 (Advanced)	May not be counted with Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced)	Class SI. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is **a** terminating course
Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced)	8	Q: Biology 1 or Biology 1 (Advanced)	May not be counted with Biology 2 (Plant Anatomy and Physiology) Auxiliary	Students must first enrol in Biology 2 (Plant Anatomy and Physiology) Auxiliary. Subsequently, selected students may be invited to enrol in this course where they will participate in alternative components of Biology 2 (Plant Anatomy and Physiology) Auxiliary. Class SI. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course
Biology 2 (Plant Ecology and Diversity) Auxiliary	8	Q: Biology 1 or Biology 1 (Advanced)	May not be counted with Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)	Class S2. This course in combination with another SI or S2 Biology Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course

(a) **Courses**	*(b)* **Unit values**	*(c)* **Qualifying** courses (Q) **Prerequisites** (P) **Corequisites** (C)	*(d)* **Faculty of Science resolutions governing courses**	*(e)* **Additional information about courses**
Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)	8	Q: Biology 1 or Biology 1 (Advanced)	May not be counted with Biology 2 (Plant Ecology and Diversity) Auxiliary	Students must first enrol in Biology 2 (Plant Ecology and Diversity) Auxiliary. Subsequently, selected students may be invited to enrol in this course where they will participate in alternative components of Biology 2 (Plant Ecology and Diversity) Auxiliary. Class S2. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course
Biology 2 (Molecular and General Genetics) Auxiliary	8	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) and one of Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	May not be counted with either Biology 2 (Molecular and General Genetics) Auxiliary (Advanced) or Biology 2 (Genetics, Cellular and Developmental) Auxiliary	Class SI. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course
Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)	8	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) and one of Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	May not be counted with either Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Genetics, Cellular and Developmental) Auxiliary	Students must first enrol in Biology 2 (Molecular and General Genetics) Auxiliary. Subsequently, selected students may be invited to enrol in this course where they will participate in alternative components of Biology 2 (Molecular and General Genetics) Auxiliary. Class SI. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course
*Biology 2 (Cellular and Developmental) Auxiliary	8	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) and one of Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)	May not be counted with either Biology 2 (Cellular and Developmental) Auxiliary or Biology 2 (Genetics, Cellular and Developmental) Auxiliary	Class S2. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course
*Biology2 (Cellular and Developmental) Auxiliary (Advanced)	8	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced) and one of Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathe-	May not be counted with either Biology 2 (Cellular and Developmental) Auxiliary or Biology 2 (Genetics, Cellular and Developmental) Auxiliary	Students must first enrol in Biology 2 (Cellular and Developmental) Auxiliary. Subsequently, selected students may be invited to enrol in this course where they will participate in alternative components

(a) Courses	*(b)* Unit values	*(c)* Qualifying courses (Q) Prerequisites (P) Corequisites (C)	*(d)* Faculty of Science resolutions governing courses	*(e)* Additional information about courses
*Biology 2 (Cellular and Developmental) Auxiliary (Advanced) *(continued)*		Mathematics 1 (Life Sciences)		Developmental) Auxiliary. Class S2. This course in combination with another SI or S2 Biology 2 Auxiliary or Auxiliary (Advanced) course may be counted as equivalent to an Intermediate Normal course, but see *Note* below. If taken individually is a terminating course
"■Biology 2 (Genetics, Cellular and Developmental) Auxiliary	8	Q: Biology 1 or Biology 1 (Advanced) P: Chemistry 1 or Chemistry 1 (Advanced)	May not be counted with either Biology 2 (Molecular and General Genetics) Auxiliary (Advanced) or Biology 2 (Cellular and Developmental) Auxiliary Advanced	Class A. Terminating course
♦Biology 2 (Animals — Theory) Auxiliary	8	Q: Biology 1 or Biology 1 (Advanced)	May not be counted with Biology 2 (Animal) (Advanced)	Class A. Terminating course
Chemical Engineering Science 2 Auxiliary	8	P: Chemistry 1 or Chemistry 1 (Advanced) and Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced)		Class A. May not be counted with any other Intermediate Engineering course
Chemistry 2 Auxiliary	8	Q: Chemistry 1or Chemistry 1 (Advanced) P: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)		Class A. Terminating course
Environmental Geology 2 Auxiliary	8			Class A. Terminating course
Mathematical Methods 2	8	Q: Mathematics 1 or Mathematics 1 (Advanced)	A candidate who has passed Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences) at distinction standard may enrol in Mathematical Methods 2. A candidate who has passed Mathmatics 1 (Life Sciences) at credit standard may apply for permission to enrol in Mathematical Methods 2. May not be	Class A. Terminating course

Note: The Faculty has classified Intermediate Introductory and Auxiliary courses according to their method of timetabling for lectures and practical sessions, namely

Classification A:—lectures and practical sessions timetabled substantially for 4 hours per week throughout the year.

Classification S:—lectures and practical sessions timetabled for 8 hours per week for one semester:

Sub-classification (SI):—in Semester 1.

Sub-classification (S2):—in Semester 2.

Each course's classification is shown in column (e).

The Faculty has resolved, pursuant to section 6(5)/that candidates taking in any one academic year two Intermediate Introductory or Auxiliary courses may not, except with the permission of the Faculty, take both courses from Classification SI or both from S2. They may, however, take two from Classification A, or one from Classification A and one from S, or one from Classification SI and one from S2.

(a) Courses	*(b)* **Unit values**	*(c)* Qualifying courses (Q) Prerequisites (P) Corequisites (C)	***(d)*** **Faculty of Science resolutions• governing courses**	*(e)* **Additional information about courses**
Mathematical Methods 2 *(continued)*			counted with Applied Mathematics 2, Applied Mathematics 2 (Advanced), Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Mathematics 2 Combined or Mathematics 2 Combined (Advanced)	
Microbiology 2 (Theory) Auxiliary	**8**	P: Biology 1 or Biology 1 (Advanced)		Class A. Terminating course
Microbiology 2 (Theory and Techniques) Auxiliary	**8**	P: Biology 1 or Biology 1 (Advanced)		Class SI. Terminating course
Physiology 2 Auxiliary	**8**			Class A. Terminating course
Soil Science 2 Auxiliary	**8**	P: Chemistry 1 or Chemistry 1 (Advanced) P: Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics. 1 (Advanced) or Mathematics 1 (Life Sciences) or Computer Science 1 or Computer Science 1 (Advanced)		Class SI. Terminating course
Statistical Methods 2	**8**	Assumed knowledge: HSC Mathematics 2-unit)	May not be counted with Mathematical Statistics 2	Class SI. If Mathematical Statistics 2 has not been passed, this course [with one of Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)] is a corequisite for Advanced Statistical Methods 2. This course in combination with Advanced Statistical Methods 2 may be counted as equivalent to an Intermediate Normal course. Terminating course
Advanced ^Statistical Methods **2**	**8 ,**	P: Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced); or both of P: Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences); and C: Statistical Methods 2	May not be counted with Mathematical Statistics 3	Class S2. This course in combination with Statistical Methods 2 may be counted as equivalent to an Intermediate Normal course. Terminating course
C. Senior courses				
Agricultural Chemistry 3	**24**	Q: Agricultural Chemistry 2 [but see column (d)]	May not be counted with Biochemistry 3. A candidate who has completed the courses Chemistry 2 and Biochemistry 2 or Biochemistry 2 Auxiliary, or Chemistry 2 Auxiliary and Biochemistry 2 and who has not taken the course Agricultural	A student may not enrol in Agricultural Chemistry 3 without having completed Agricultural Chemistry 2, if a terminating pass has been awarded in any of the 4 courses specified in column (d)

(a) **Courses**	*(b)* **Unit values**	*(c)* **Qualifying courses (Q) Prerequisites (P) Corequisites (C)**	*(d)* **Faculty of Science resolutions governing courses**	***(e)*** **Additional information about courses**
Agricultural Chemistry 3 *(continued)*			Chemistry 2 may apply for permission of the Faculty to enrol in the course Agricultural Chemistry 3	
Applied Mathematics 3	**24**	**Q:** Applied Mathematics 2 or Applied Mathematics 2	May not be counted with Applied Mathematics 3 (Advanced)	Students who complete the course Mathematics 2 Combined or Mathematics 2 Combined (Advanced) may enrol under section 6(4) in Applied Mathematics 3 (Advanced)
Applied Mathematics 3 (Advanced)	**24**	Q: Applied Mathematics 2 or Applied Mathematics 2 (Advanced)	May not be counted with Applied Mathematics 3	Students who complete the course Mathematics 2 Combined or Mathematics 2 Combined (Advanced) may enrol under section 6(4) in Applied Mathematics 3 (Advanced)
Biochemistry 3	**24**	Q: Biochemistry 2	May not be counted with Agricultural Chemistry 3	
Biology 3	**24**	Q: Biology 2 [but see column *(d)]*	Some options in Biology 3 require a particular Biology 2 course or course combination as the qualifying course for the option	Students are advised to consult the School about option qualifying courses
Cell Pathology 3	**24**	P: Biochemistry 2 or Physiology 2 or Biology 2 (Molecular and General Genetics) Auxiliary/ (Advanced) and Biology 2 (Genetics, Cellular and Developmental) Auxiliary/ (Advanced)		Students are advised to consult the Department about suitable subject combinations. Only a small number of students can be accommodated in the laboratory facilities
Chemistry 3	**24**	Q: Chemistry 2 or Chemistry 2 Long		
Computer Science 3	**24**	Q: Computer Science 2 P: Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Applied Mathematics 2 or Applied Mathematics 2 (Advanced) or Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced)		Candidates who wish to proceed to Computer Science Honours should desirably have completed a Senior Mathematics course. Electrical Engineering Mathematics 2 is an adequate prerequisite for Engineering students wishing to enrol in Computer Science 3
Geography 3 (Environmental)	**24**	Q: Geography 2		
Geography 3 (Human)	**24**	Q: Geography 2		
Geography 3 (Geomorphology)	24	Q: Geography 2		The Pedogeomorphology option must not be chosen by those students who completed or intend to complete Soil Science 2
Geology 3	**24**	Q: Geology 2		
Geophysics 3	**24**	C: Geology 3 or Applied Mathematics 3 or Applied Mathematics 3 (Advanced) or Physics 3 or Pure Mathematics 3 or Pure Mathematics 3 (Advanced)		

(a) **Courses**	*(b)* **Unit values**	*(c)* **Qualifying courses (Q) Prerequisites (P) Corequisites (C)**	*(d)* **Faculty of Science resolutions governing courses**	*(e)* **Additional information about courses**
History and Philosophy of Science 3	**24**	**Q:** History and Philosophy of Science 2 Introductory P: Physics 1 or Physics 1 (Advanced) or Chemistry 1 or Chemistry 1 (Advanced) or Biology 1 or Biology 1 (Advanced)	Candidates taking this course must complete another Senior course in order to satisfy the requirements for the BSc degree	
Marine Sciences 3	**24**	Q: Marine Sciences 2 Introductory	All selections of options must be approved by the Director of the Marine Studies Centre	Students should consult the prerequisites for each of the component course options listed in the Faculty Handbook entry for Marine Sciences 3
Mathematical Statistics 3	**24**	Q: Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced) P: Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Applied Mathematics 2 or Applied Mathematics 2 (Advanced)	May not be counted with Advanced Statistical Methods 2 or Mathematical Statistics 3 (Advanced)	
Mathematical Statistics 3 (Advanced)	**24**	Q: Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced) P: Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Applied Mathematics 2 or Applied Mathematics 2 (Advanced)	May not be counted with Advanced Statistical Methods 2 or Mathematical Statistics 3	
Microbiology 3	**24**	Q: Microbiology 2 Or Microbiology 2 (Advanced) P: Biochemistry 2 or Biochemistry 2 Auxiliary or Agricultural Chemistry 2 or Biology 2 (Molecular and General Genetics) Auxiliary/ (Advanced)	May not be counted with Microbiology 3 (Advanced)	
Microbiology 3 (Advanced)	**24**	Q: Microbiology 2 or Microbiology 2 (Advanced) P: Biochemistry 2 or Biochemistry 2 Auxiliary or Agricultural Chemistry or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)	May not be counted with Microbiology 3	
Pharmacology 3	**24**	Q: Pharmacology 2 Introductory		Students are strongly advised to consider 16-unit courses in Biochemistry 2 and/or Chemistry 2 together with the 8-unit course Physiology 2 Auxiliary if they wish to undertake Pharmacology 3
Physics 3	**24**	Q: Physics 2 P: Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Mathematics 2 Combined or Mathematics 2 Combined (Advanced) or Applied Mathematics 2 or Applied Mathematics 2 . (Advanced)		
Psychology 3	**24**	Q: Psychology 2A or Psychology 2		

(a) **Courses**	*(b)* **Unit values**	*(c)* **Qualifying courses (Q) Prerequisites (P) Corequisites (C)**	*(d)* Faculty of **Science resolutions governing courses**	*(e)* **Additional information about courses**
Pure Mathematics 3	24	**Q:** Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Mathematics 2 Combined or Mathematics 2 Combined (Advanced)	May not be counted with Pure Mathematics 3 (Advanced)	Students who complete the course Mathematics 2 Combined or Mathematics 2 Combined (Advanced) may enrol under section 6(4) in Pure Mathematics 3
Pure Mathematics 3 (Advanced)	24	Q: Pure Mathematics 2 or Pure Mathematics 2 (Advanced) or Mathematics 2 Combined or Mathematics 2 Combined (Advanced)	May not be counted with Pure Mathematics 3	Students who complete the course Mathematics 2 Combined or Mathematics 2 Combined (Advanced) may enrol under section 6(4) in Pure Mathematics 3 (Advanced)
Soil Science 3	24	Q: Soil Science 2 P: Chemistry 2 or Agricultural Chemistry 2 or Biochemistry 2		
D. Senior Additional courses (May only be taken with approval of the Head of Department/School)				
Biology 3 Additional	**24**	C: Biology 3		
Chemistry 3 Additional	24	C: Chemistry 3		
Computer Science 3 Additional	24	C: Computer Science 3		
Geology 3 Additional	24	C: Geology 3		
Pharmacology 3 Additional	24	C: Pharmacology 3		This course may only be taken concurrently with Pharmacology 3 and together with it constitutes the 48-unit course Pharmacology 3 Advanced

Table: Law courses [see section 12]

(Available to students enrolled concurrently for the degrees of Bachelor of Science and Bachelor of Laws)

(a) Courses	(b) Unit values	(c) Prerequisites (P)
A. Junior course		
Legal Institutions	**12**	
B. Intermediate and Senior courses		
Constitutional Law	6	Legal Institutions
Torts	6	Legal Institutions
Administrative Law	6	Legal Institutions
Contracts	6	Legal Institutions
Criminal Law	6	Legal Institutions

Combined degrees

Combined Science/Law degrees

BSc/LLB

The University offers a combined Science/Law course similar to the combined courses of Arts/Law and Economics/Law. The purpose of the course is to meet a demand for science graduates with legal training.

A student who is selected for enrolment in the Science/Law course may proceed to the LLB degree at the same time as being a candidate for the BSc degree, and may count up to 42 units of Law subjects, comprising Legal Institutions (12 units) and five 6-unit courses as specified below towards the Science degree. No other courses offered by other faculties may be credited towards the BSc degree. On completion of the remaining requirements for the Science degree, as specified in section 12 of the resolutions of the Senate relating to the degree of Bachelor of Science; this degree is awarded and the student can thenproceed to complete the requirements for the degree of Bachelor of Laws.

The order in which Law courses are taken is specified in the resolutions of the Senate governing the degree of Bachelor of Laws as follows:

(i) in the first year of attendance the student will take three Science Junior courses and the course Legal Institutions,

(ii) in the second year of attendance the student will take two Science Intermediate courses, and Constitutional Law (6 units), Torts (6 units) and Criminal Law (6 units); **note that Criminal Law can be taken in either the second or third year.**

(iii) in the third year of attendance the student will take Administrative Law (6 Units) Contracts (6 Units) and, if not taken in second year, Criminal Law (6 Units).

A course in Legal Research and Writing must also be completed. In addition the student will take Science courses which will include at least one Senior course and any other courses required to give the student a minimum of 72 units of Science courses at Intermediate and Senior level, and at least the minimum of 140 units required for the BSc degree.

In the combined Science/Law course students will spend the first three years in the main University grounds during which time the Science degree is completed along with the equivalent of one year's study towards the Law degree. The remainder of the course will be completed at the Law School in the city during aperiod of two years. Full details of the courses to be completed during this time are included in the Faculty of Law Handbook.

General enquiries about the combined Science/ Law course should be addressed to the Secretary to the Faculty of Science.

Honours courses

Students interested in graduating with Honours should bear the following in mind:

1. Students taking the combined Science/Law course who wish to take an Honours course in Science and whose examination results in their early years qualify them to do so, may elect to spend an additional year in Science after the third year. Note, however that the Faculty of Law generally permits only one year of suspension of candidature from the Bachelor of Laws degree (including the combined Science/Law degree). Alternatively, it may be possible for students to defer an Honours year in Science until after the completion of the entire combined course.

2. There is no separate Honours course for the degree of Bachelor of Laws. Graduation with Honours in Law requires a high standard of performance in all courses for the LLB degree. Some of these courses are taken during the first three years of the combined course while the student is completing the Science segment of the course.

Combined Arts/Science degrees

BA/BSc resolutions of the Faculty

These resolutions should be read in conjunction with the resolutions of Senate governing candidature for the degrees of Bachelor of Arts and Bachelor of Science.

1. Candidates who have completed at least the equivalent of 48 units may be permitted to enrol in the combined Arts/Science program.

2. Candidature for the combined program is full-time.

3. Candidates qualify for the combined degrees by completing 240 units including:

(i) a 12-unit first year Mathematics course; and

(ii) either a 12-unit first year Physics course or a 12-unit first year Chemistry course; and

(iii) (a) at least 72 Senior units from Part A of the Table of Courses for the BA, including a major, followed by (b) at least 72 units from Senior and Intermediate courses in the Bachelor of Science degree taken in accordance with the resolutions of the BSc.

4. Candidates may not enrol in any course which is substantially the same as one they have already passed.

5. Thoseadmitted to the program while candidates for the degree of Bachelor of Arts shall continue to be under the general supervision of the Faculty of Arts for the ensuing two years of full-time candidature or equivalent, after which they shall be under the general supervision of the Faculty of Science. Those admitted to the program while candidates for the degree of Bachelor of Science shall continue to be under the general supervision of the Faculty of Science for the ensuing two years of full-time candidature or equivalent, after which they shall be under the general supervision of the Faculty of Arts. Those admitted from other institutions or faculties shall be under the supervision first of that one of the Faculty of Arts or the Faculty of Science which is most similar to the Faculty in which they were previously enrolled. General supervision covers all areas of policy and procedure affecting candidates such as degree rules, course nomenclature, enrolment procedures and the Dean to whom reference is to be made at any given time.

6. Candidates who are qualified to do so may complete an Honours year. In cases where the Honours year may be completed in either Faculty, it shall be completed in the Faculty in which the candidate has completed the final qualifying course for the Honours year.

7. Candidates may abandon the combined program and elect to complete either a BSc degree or a BA in accordance with the resolutions of the Senate governing those degrees.

8. The Deans of Arts and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt within the Resolutions of the Senate or these resolutions.

Combined Science/Engineering degrees

BSc/BE resolutions of the Faculty

1. Pursuant to section 13 of the resolutions of the Senate governing the degree of Bachelor of Science, students who are of two or three years' standing in the Faculty of Engineering maybe admitted to candidature for the degree.

2. To be eligible for admission, such students:

(1) must have gained credit in the Faculty of Engineering for not less than 96 units if of two years standing in that Faculty, or not less than 108 units if of three years' standing in that Faculty; and

(2) except with the permission of the Dean of the Faculty of Science, must have completed, at full Pass level or better, all courses attempted in the Faculty of Engineering at their first examination, including at least two Intermediate Normal or Intermediate Long courses offered by Departments of the Faculty of Science, one of which may be the Engineering-course Mathematics 2. In some circumstances students may be permitted to count as *one* of the Intermediate courses for this purpose, courses (undertaken in the Faculty of Engineering) which combined are the equivalent of one of the following courses in the Faculty of Science:

Chemical Engineering Science 2
Civil Engineering Science 2
Mechanical and Aeronautical Engineering Science 2

(3) For the purposes of this resolution:

(i) students who have completed the combination of courses Mathematics 2EE, Physics 2EE, Computer Science 2A and Electrical Engineering 2 will be considered to have completed two Intermediate Normal courses in Science and to have qualified for enrolment in the Senior courses Pure Mathematics 3, Physics 3 and, with the permission of the Dean of Science, Applied Mathematics 3; and

(ii) students who, instead of completing the course Computer Science 2, complete the combination of courses Computer Science 2A and Computer Science 2B will be considered to have completed an Intermediate Normal course in Science and qualified for enrolment in the Senior course Computer Science 3.

3. To qualify for the award of the Pass degree, candidates (after admission under section 13 of the resolutions of the Senate governing the degree of Bachelor of Science) shall complete, in one year of full-time study or in two consecutive years of part-time study, courses totalling at least 48 units subject to the provisos:

(1) that at least 24 of the required 48 units shall be for a Senior course and, if only one Senior course is completed, at least 16 of the remaining 24 units shall be for an Intermediate Normal or Long course; and

(2) that, except with the permission of the Dean, the 48 units shall not include any units:

(i) for courses listed under section 5(1) Group B of the Senate resolutions relating to the degree of Bachelor of Science,

(ii) for any courses already attempted either completely or in part within the Faculty of Engineering,

(iii) for all or part of the courses:
Chemical Engineering Science 2
Chemical Engineering Science 2 Auxiliary
Civil Engineering Science 2
Mechanical and Aeronautical Engineering Science 2.

Such permission will be given only if the candidate has not counted one of these courses as an Intermediate course for the purpose of gaining admission under section 13; up to 16 units, taken in one year to complete *one* of the above courses, may then be included. Any one of the 16 unit courses above may thenbe counted as an Intermediate course for the purposes of part (1) of this resolution provided the whole course is completed in one year.

4. Candidates admitted under section 13 shall comply with section 6 of the resolutions of the Seriate governing the degree of Bachelor of Science.

5. To qualify for admission to Honours courses, such candidates shall comply with section 15 of the resolutions of the Senate.

There is no provision for students admitted under section 13 to continue in the Faculty of Science after one full-time or two part-time years of study except to complete an Honours course. Candidates who fail to complete the required 48 units may only be re-admitted to the Faculty of Science if a successful application is made at the appropriate time through the Universities Admissions Centre. Successful applicants will be given credit for courses completed in accordance with section 11 of the resolutions of the Senate governing the degree of Bachelor of Science.

Progression into the Faculty of Engineering

Graduands/graduates in the Faculty of Science at this University, who wish to transfer to the Bachelor of Engineering degree course, must make application through the Universities Admissions Centre by the appropriate closing date in the year prior to proposed entry into the Faculty of Engineering.

Applications will be considered on the basis of academic merit. Consideration will be given to H.S.C. examination results and examination results in the Faculty of Science (and to results in any other tertiary courses completed). The offer of a place in the Faculty of Engineering is NOT automatic and the competition for entry is keen.

Graduands/graduates in the Faculty of Science who are offered a place in the Faculty of Engineering may be able to complete the BE degree requirements in two further years of full-time study. It would be necessary to have completed appropriate courses in the Faculty of Science so that credit for/exemption from all or most of the Junior and Intermediate core course prescribed for that branch of Engineering in which you wish to proceed could be given.

The Departments in the Faculty of Engineering have indicated that they would recommend that a Science graduand / graduate be given sufficient credi t / exemption to enable him/her to complete the BE degree requirements in two years if he/she has completed the courses set out below.

The BSc degree requirements would need to have been completed in the minimum time and in some Engineering Departments minimum standards of performance in Science courses are required.

Aeronautical Engineering
Chemistry 1
Computer Science 1
Mathematics 2 (Pure or Applied)
Physics 2
Mechanical and Aeronautical Engineering Science 2

Chemical Engineering
Mathematics 2 (Pure or Applied)
Chemistry 2
Chemical Engineering Science 2

Civil and Mining Engineering
Chemistry 1
Physics 1 or Computer Science 1 or Physics 1 (Life Sciences)
Mathematics 2 (Pure or Applied)
Civil Engineering Science 2

Electrical Engineering
Mathematics 2 (Pure or Applied)*
Computer Science 2*
Physics 3*

These courses would need to have been passed at Credit level or better.

Mechanical Engineering
Chemistry 1
Computer Science 1
Mathematics 2 (Pure or Applied)
Physics 2
Mechanical and Aeronautical Engineering Science 2

Students need to achieve good grades in these courses.

Students will be required to enrol in Mechanical Design 1A when entering Mechanical Engineering.

Combined Science/Medicine degrees

BSc/MB BS resolutions of the Faculty

1. Pursuant to section 14 of the resolutions of Senate governing candidature for the degree of Bachelor of Science, students may enrol concurrently in the BSc, MB and BS degrees. Such candidates may satisfy the requirements for the BSc degree by completing at least 92 units including at least 72 units at Intermediate or Senior level, at least 24 units of which shall be at Senior level, in courses as prescribed in sections 2 and 4. On completion of these 92 units, candidates will be credited with the equivalent of 48 units towards the BSc degree from courses completed in the first year of the MB and BS degrees.

2. Candidates admitted in accordance with section 1 may credit only Junior, Intermediate, Senior and Senior Advanced courses offered by the Departments/ Schools of Chemistry, Computer Science, Applied Mathematics, Pure Mathematics, Mathematical Statistics and Physics towards the additional 92 units required for the BSc degree.

3. Except with the permission of the Faculty of Science, candidates may not enrol in a course unless they have completed those courses specified as prerequisites in section 3 of the resolutions of Senate governing the degree of Bachelor of Science. The course Chemistry, available to first year students in the Faculty of Medicine, is an alternative qualifying course for Chemistry 2.

4. (a) Except with the permission of the Faculties of Medicine and Science, a candidate who does not intend to proceed to Computer Science 3 shall:
   (i) enrol in year 1 in the courses prescribed for the first year of the MB BS degrees, Mathematics 1 or Mathematics 1 (Advanced) and, if the candidate so chooses, in Physics 1 or Physics 1 (Advanced);
   (ii) enrol in each of years 2 and 3 in the courses prescribed for the MB BS degrees and in an Intermediate Normal course; and
   (iii) enrol in year 4 as a full-time student in the Faculty of Science either in two Senior courses or in one Senior course, one Intermediate Normal course and in one 8 or 12 unit course,

   (b) Except with the permission of the Faculties of Medicine and Science, a candidate who intends to proceed to Computer Science 3 shall:
   (i) enrol in year 1 in the courses prescribed for the first year of the MB BS degrees, Mathematics 1 or Mathematics 1 (Advanced) and, if the candidate so chooses, in Physics 1 or Physics 1 (Advanced);
   (ii) enrol in each of years 2 and 3 in the courses prescribed for the MB BS degrees and in either Computer Science 1 or Computer Science 1 (Advanced) or an Intermediate Normal course;
   (iii) enrol in year 4 in courses prescribed for the fourth year of the MB BS degrees and in an Intermediate Normal course; and

(iv) enrol in year 5 as a full-time student in the Faculty of Science in Computer Science 3 and either in one other Senior course or in an Intermediate Normal course.

(c) Notwithstanding the provisions of section 4(b), wi th the permission of the Faculties of Medicine and Science and of the Head of the Department of Computer Science, a candidate who has completed the course Computer Science 2 may enrol in year 4 as a full-time student in the Faculty of Science in Computer Science 3, an Intermediate Normal course in Mathematics and in one other Intermediate Normal course.

5. Except with the permission of the Faculties of Medicine and Science, candidates may not enrol in courses other than those prescribed in sections 2 and 4.

6. To qualify for admission to Honours courses in the Faculty of Science, candidates shall comply with section 15 of the resolutions of the Senate governing the degree of Bachelor of Science.

7. There is no provision for students admitted in accordance with section 1 to continue in the Faculty of Science after completion of their full-time year in that Faculty (as prescribed in section 4) except to complete an Honours course.

8. Candidates who fail to complete the requirements for the award of the degree of Bachelor of Science at the end of their full-time year in the Faculty of Science may only be readmitted to that Faculty if a successful application is made at the appropriate time through the Universities Admissions Centre. Successful applicants will be given credit for courses completed in accordance with section 11 of the resolutions of Senate governing the degree of Bachelor of Science.

Degree of Bachelor of Pharmacy

Summary of requirements

Progression towards the degree of Bachelor of Pharmacy is by the accumulation of unit points. The requirements for the degree are set out in the Senate resolutions, which should be read by all intending candidates (see below). All candidates must attend as full-time students.

To satisfy the requirement for the Pass degree candidates must gain a total of 146 units by completing the courses prescribed for the degree (see section 3).

The basic requirements are contained in sections 4, 5 and 6.

During the first year of attendance candidates enrol in seven Junior (first year) courses as follows: Mathematics 1 for Pharmacy, Biology 1 for Pharmacy, Physiology 1 for Pharmacy, Chemistry 1 for Pharmacy, Introductory Pharmacy 1, Microbiology 1 for Pharmacy and Biostatistics 1 for Pharmacy.

Assumed knowledge: It should be noted that most of the above Junior (first year) courses will be taught on the assumption that students have reached the standard specified in Part A of the 'Table of Courses' below at the Higher School Certificate examination or equivalent level.

Prerequisites and corequisites: To be eligible to enrol in most Intermediate and Senior courses, students must have completed the qualifying course, if any, and the prerequisite course(s), if any. Any corequisi te course(s) no t previously completed must be taken concurrently. (See section 1.)

Registration requirements for pharmacists

A student who intends to qualify to be registered as a pharmacist under the Pharmacy Act 1964 is first required to qualify for the degree of Bachelor of Pharmacy. In addition he or she is required to serve not less than 2300 hours as an assistant to a registered pharmacist in a pharmacy inside the Commonwealth of Australia. This period must be served after the BPharm course has been completed, except that not more than 300 of these hours may be served earlier, providing that the first academic year of the course has been successfully completed.

Further details concerning the requirements for registration can be obtained from the Pharmacy Board of New South Wales, 3rd Floor, 28 Foveaux Street, Surry Hills, N.S.W. 2010, tel. (02) 281 7736, fax (02) 281 2924. Postal Address: Locked Bag 2, Haymarket, N.S.W. 2000.

Resolutions of Senate

The following resolutions governing candidature for the degree of Bachelor of Pharmacy have been prescribed by the Senate.

Definitions

1. For the purposes of these resolutions:

(1) (i) A *course* shall consist of lectures together with such tutorial instruction, essays, exercises, or practical work as may be prescribed.

(ii) Each course shall be designated as a *Junior* course, an *Intermediate* course, a *Senior* course or an *Honours* course.

(iii) Junior, Intermediate, Senior or Honours courses are indicated by the Arabic numeral, 1, 2, 3 or 4 respectively placed immediately after the name of a subject.

(2) To *'complete a course'* and derivative expressions mean:

(i) to attend the lectures and the meetings, if any, for tutorial instructions;

(ii) to complete satisfactorily the essays, exercises and the practical work, if any; and

(iii) to pass the examinations of the course.

(3) A *prerequisite course* means a course which, except with the permission of the head of the department concerned, must have been completed prior to a candidate taking a course

for which the Faculty has declared it to be a prerequisite.

(4) A *corequisite course* means a course which unless previously completed must, except with the permission of the Head of Department concerned, be taken concurrently with the course for which the Faculty has declared it to be a corequisite.

Grades of award

2. Thedegreeshallbeawardedin2grades,namely the Pass degree and the Honours degree.

Courses for Pass degree

3. Courses for the degree shall—

(1) be in such subjects,

(2) have such unit values, and

(3) have such prerequisite and corequisite courses as are set out in the table associated with this resolution.

Qualification for Pass degree

4. To complete the requirements for the Pass degree a candidate shall gain 146 units by completing the Junior, Intermediate and Senior core courses, and one of the Senior elective courses set out in the tables in section 3.

Enrolment in courses

5. (1) Inthefirstyearofattendancecandidates, unless granted credit in accordance with section 8, shall enrol in all the Junior courses listed in the table associated with section 3.

(2) ExceptwiththepermissionoftheFaculty and subject to the exigencies of the timetable, candidates in subsequent years of attendance shall enrol in the maximum number of prescribed courses for which they are qualified, provided that they may not take courses totalling in excess of 52 units.

Restrictions on enrolment

6. (1) ExceptwiththepermissionoftheFaculty, candidates may not take an Intermediate course—

(i) until they have gained credit for at least 32 units in Junior courses, and

(ii) until they have completed the Junior courses, if any, prescribed by the Faculty as prerequisites for the Intermediate course, as set out in section 3.

(2) ExceptwiththepermissionoftheFaculty candidates may not take a Senior course—

(i) until they have gained credit for at least 32 units derived from Intermediate courses, and

(ii) until they have completed all the Junior and Intermediate courses, if any, prescribed as prerequisites for the Senior course as set out in section 3.

(3) Candidates may not take a higher course in any subject without having previously completed the lower course, if any, in the same subject.

(4) The enrolment by candidates in courses shall be limited by the exigencies of the timetable.

Course assessment

7. (1) Candidates may be tested by written and oral class examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.

(2) In all courses work of a standard higher than that required for an ordinary pass may be recognised by the award of High Distinction, Distinction or Credit.

(3) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Faculty Board of Examiners shall determine.

(4) Candidates who do not pass in a course shall, unless exempted by the Dea^againattend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to fe-enrol.

(5) Candidates who present themselves for re-examinationin any course shallnotbe eligible for any prize or scholarship awarded in connection with such examination.

Credit for courses

8. (1) Candidates who have previously completed studies which are considered by the Faculty to be equivalent to any course listed in the tables associated with section 3 may be given credit for "that course providing that:

(i) in the case of graduates, the total unit value of the courses so credited may not exceed 52.

(ii) in the case of students who have completed courses in another tertiary program without graduating and who have abandoned credit in that program for the courses on thebasis of whichcredit is sought, any number of courses may be credited.

(2) Candidates who have been given credit for courses listed in the tables, in accordance with section 8(1), shall be regarded as having completed such courses for the purposes of these resolutions.

Admission to Honours courses

9. (1) In order to qualify for admission to an Honours course candidates shall have qualified for the award of a Pass degree and be considered by the Faculty and the Head of the Department concerned to have the requisite knowledge and aptitude for an Honours course.

(2) With the permission of the appropriate Head of Department and provided the requirements in subsection (1) have been satisfied the following may also be admitted to Honours courses:

(i) Pass graduates in Pharmacy of the Faculty of Science.

(ii) Pass graduates holding Bachelor of Pharmacy degrees from such other institutions as the Faculty may from time to time determine.

(3) Candidates may not take more than one Honours course in any one academic year.

(4) Candidates who have qualified for the Honours degree may take, in the next year or at such later times as the Faculty permits, an additional Honours course which they are qualified to enter.

Honours courses

10. (1) Candidates for the Honours degree shall complete an Honours course.

(2) There shall be an Honours course in the following subjects: Pharmacy Practice, Pharmaceutics, Pharmaceutical Chemistry, Pharmacology.

Classes of Honours and Medal

11. (1) There shall be three Classes of Honours, namely Class I, Class II and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.

(2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.

(3) There shall be no re-examination for Honours.

Candidates enrolled before 1990

12. (1) A personwho has enrolled as a candidate for the degree of Bachelor of Pharmacy before 1 January 1990 may complete the requirements for the degree in accordance with the resolutions in force at the time the candidate commenced that degree provided that the candidate completes the requirements for the degree by 31 December 1994 or such later date as the Faculty may approve in special cases; and that if a course specified in those resolutions is discontinued the Faculty may permit the candidate to substitute a course or courses deemed by the Faculty to be equivalent to the discontinued course.

(2) Where a candidate proceeding pursuant to subsection (1) fails to complete the requirements for the degree before 31 December 1994 the candidate shall complete the requirements for the degree under such conditions as may be determined from time to time by the Dean.

Table of courses for Pharmacy —1990 resolutions [see section 3]

Course	Unit value	Prerequisites (P) Corequisites (C) Assumed knowledge (Ak)
A. Junior courses		
Mathematics 1 for Pharmacy .	**4**	**Ak:** Mathematics 2 unit course
Biology 1 for Pharmacy	**8**	Ak: See footnote
Physiology 1 for Pharmacy	**6**	
Chemistry 1 for Pharmacy	**16**	Ak: See footnote
Introductory Pharmacy 1	**8**	Ak: See footnote
Microbiology 1 for Pharmacy	**3**	Ak: See footnote
Biostatistics 1 for Pharmacy	**3**	Ak: See footnote
B. Intermediate **courses**		
Physical Pharmacy 2	**10**	P: Introductory Pharmacy 1 P: Chemistry 1 for Pharmacy
Pharmaceutical Analysis 2	**8**	P: Chemistry 1 for Pharmacy
Medicinal Chemistry 2	**4**	P: Chemistry 1 for Pharmacy P: Introductory Pharmacy 1 C: Biochemistry 2 for Pharmacy C: Pharmacology 2 for Pharmacy
Dispensing Practice 2	**4**	P: Introductory Pharmacy 1 C: Physical Pharmacy 2
Pharmaceutical Microbiology 2	**4**	P: Introductory Pharmacy 1 P: Microbiology 1 for Pharmacy
Pharmacy Practice 2	**8**	P: Physiology 1 for Pharmacy P: Introductory Pharmacy 1 C: Pharmacology 2 for Pharmacy C: Medicinal Chemistry 2 C: Pharmaceutical Microbiology 2
Biochemistry 2 for Pharmacy	**6**	P: Chemistry 1 for Pharmacy

Course	Unit value	Prerequisites (P) Corequisites (C) Assumed knowledge (Ak)
Pharmacology 2 for Pharmacy	**4**	**P:** Physiology 1 for Pharmacy P: Chemistry 1 for Pharmacy C: Biochemistry 2 for Pharmacy C: Pharmacy Practice 2
C. Senior courses		
(i) Core		
Pharmacokinetics 3	**4**	P: Physical Pharmacy 2
Formulation 3	**4**	P: Physical Pharmacy 2
Medicinal Chemistry 3	**4**	P: Biochemistry 2 for Pharmacy C: Pharmacology 3 for Pharmacy
Dispensing Practice 3	**4**	C: Formulation 3
Pharmacy Practice 3	**18**	C: Pharmacology 3 for Pharmacy C: Medicinal Chemistry 3 C: Pharmacokinetics 3
Pharmacology 3 for Pharmacy	**8**	P: Biochemistry 2 for Pharmacy C: Pharmacy Practice 3
(ii) Elective		
Biopharmaceutics 3	**8**	C: Pharmacokinetics 3 C: Formulation 3 C: Dispensing Practice 3
Toxicology 3	**8**	C: Medicinal Chemistry 3
Industrial Pharmacy 3	**8**	C: Pharmacokinetics 3 C: Formulation 3
Experimental Pharmacology 3	**8**	C: Pharmacology 3 for Pharmacy C: Medicinal Chemistry 3

Note: HSC Chemistry (2-unit) and Mathematics (2-unit), or their equivalents, are considered essential preparation for Pharmacy. In addition it is highly desirable that students have completed Biology as a second 2-unit HSC Science course. The 3- and 4-unit combined Science courses including the Biology component are acceptable alternatives.

Degree of Bachelor of Medical Science

Summary of requirements

Entry to the degree course occurs at the beginning of the second, or Intermediate year. The first year of study requires enrolment in the courses Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), Physics 1 or Physics 1 (Advanced), Chemistry 1 or Chemistry 1 (Advanced) and Biology 1 or Biology 1 (Advanced). Entry to the degree with other first year subjects such as Computer Science 1 or Computer Science 1 (Advanced) or Psychology 1 instead of Biology 1 or Biology 1 (Advanced) will be possible with the approval of the Interdepartmental Committee. The criterion for admission to the quota of places will be academic merit.

Students should apply for admission through the Universities Admissions Centre by 30 September in the year they undertake their first year of study.

The total number of units to be completed for the award of the degree is 150, comprising 48 units from Junior courses (completed before admission to the Intermediate year of the BMedSc course), 52 units from Intermediate courses and 50 units from Senior courses. The curriculum for the second and third years comprises a core (44 units in second year and 14 units in third year) plus options (8 units in second year and 36 units in third year).

Students are required to pass all components of the core courses in order to progress in the degree. It is possible for students to 'carry' their 8-unit option from the Intermediate year into the Senior year, provided that it is not a prerequisite for an option they may wish to undertake in the Senior year. Furthermore, a student who takes Biochemistry 2 (Medical Sciences) [8-unit core of Biochemistry (Medical Sciences) Auxiliary plus the optional 8 units of Biochemistry 2 (Medical Sciences) Practical] and who fails that course, will be deemed to have failed that section of the Intermediate core course and may not proceed into the Senior core course.

Students who wish to discontinue enrolment in the BMedSc course may apply for admission to the BSc course through the Universities Admissions Centre. If entry to the BSc course occurs after the Intermediate year a student can resume a conventional BSc degree structure without penalty. However, the only 24-unit courses available to such a student for completion of the BSc degree are Pharmacology 3 and, provided the appropriate options have been completed in the Intermediate year, Biochemistry 3, or Biology 3, or History and Philosophy of Science 3.

Regulations

Resolutions of the Senate

The following resolutions governing candidature for the degree of Bachelor of Medical Science have been prescribed by the Senate.

Definitions

1. (1) (i) A *course* shall consist of lectures together with such tutorial instruction, essays, exercises, or practical work as may be prescribed.

(ii) Each course shall be designated as a *Junior* course, an *Intermediate* course, a *Senior* course or an *Honours* course.

(iii) Junior, Intermediate, Senior or Honours courses are indicated by the Arabic numeral 1, 2, 3 or 4 respectively placed immediately after the name of a subject.

(2) To *'complete a course'* and derivative expressions mean:

(i) to attend the lectures and the meetings, if any, for tutorial instructions;

(ii) to complete satisfactorily the essays, exercises and the practical work, if any; and

(iii) to pass the examination of the course.

(3) **Qualifying course** means a course which must be completed with a result of Pass or better (not a Terminating Pass).[1]

(4) **Prerequisite course** means a course other than a qualifying course in a subject which, except with the permission of the head of the department concerned, must have been completed prior to a candidate taking a course for which the Faculty has declared it to be a prerequisite.

(5) **Corequisite course** means a course which unless previously completed must, except with the permission of the head of department concerned, be taken concurrently with the course for which the Faculty has declared it to be a corequisite.

Grades of award

2. The degree shall be awarded in two grades, namely the Pass degree and the Honours degree.

Courses for Pass degree

3. Courses for the degree shall—

(1) be in such subjects,

(2) have such unit values, and

(3) have such qualifying, prerequisite and corequisite courses as are set out in the table associated with this resolution.

Qualification for Pass degree

4. To complete the requirements for the pass degree a candidate shall:

(1) complete the Junior, Intermediate, and Senior core courses, one Intermediate elective course, and the Senior elective courses, as set out in the table in Section 3;

(2) gain credit totalling at least 150 units, not more than 16 units of which (obtained from not more than two whole courses) shall be credited from courses in which terminating passes have been awarded; and

(3) not have any courses credited more than once for the degree.

Enrolment in courses

5. (1) Entry to the degree program will be at the completion of the Junior courses set out in the tables in section 3, except where credit for these courses has been granted in accordance with section 8. These Junior courses will be completed according to the resolutions for the Bachelor of Science and are qualifying courses for entry to the degree.

(2) In the first year of the degree (the Intermediate year), candidates shall enrol in the Intermediate courses listed in the table associated with section 3. Credit for component courses in the degree may be granted by the Faculty of Science in accordance with section 8.

(3) Subject to section 6, except with the permission of the Faculty, candidates in subsequent years of attendance shall enrol in the prescribed Senior core courses and the required number of optional Senior courses as set down in the Table in section 3.

Restrictions on enrolment

6. (1) Except with the permission of the Faculty, candidates may not take the Intermediate core course until they have completed all the Junior courses prescribed by the Faculty as qualifying courses as set out in section 3.

(2) Except with the permission of the Faculty, candidates may not take a Senior course—

(i) until they have gained credit for the 44 core units in the Intermediate program, and

(ii) until they have completed the Intermediate courses, if any, prescribed as prerequisites for the Senior course, as set out in section 3.

(3) The enrolment by candidates in the degree will be subject to a quota. The enrolment by candidates in some Senior option courses may be limited by the exigencies of the timetable and some Senior option courses may also be subject to a quota.

Terminating Pass

7. Candidates who have been awarded a terminating pass in any course may take that course again. On completion of this course such candidates will not be credited with any further units unless the course is completed at least at pass level and the units had not previously been credited in accordance with section

[1] See sections 7 and 8(6).

4(2) which limits the number of units which shall be credited from the courses in which terminating passes have been awarded.

Course assessment

8. (1) Candidates shall be tested by written or oral examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.

(2) In all courses, passes may be graded into High Distinction, Distinction, Credit and Pass; and in Intermediate courses (except the course Human Life Sciences 2), Terminating Pass. The grades High Distinction, Distinction or Credit indicate work of a standard higher than that required for a pass.

(3) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Faculty Board of Examiners shall determine.

(4) Candidates who do not pass in a course shall, unless exempted by the Dean, again attend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to re-enrol.

(5) Candidates who repeat any course shall not be eligible for any prize or scholarship awarded in connection with such examination.

(6). In any Intermediate course, except the course Human Life Sciences 2, the Faculty Board of Examiners may award a terminating pass which, subject to the provisions of Section 4(2), entitles the candidate to be credited with the full number of units for that course. Candidates who have been awarded a terminating pass in a course are not thereby qualified to take a higher course in that subject, but otherwise such candidates shall be held to have completed such a course.

Credit for courses

9. (1) Candidates who have previously completed studies which are considered by the Faculty to be equivalent to any course listed in the table associated with section 3 may be given credit for that course providing that:

(i) in the case of graduates, the total unit value of the course so credited may not exceed 52.

(ii) in the case of students who have completed courses in another tertiary program without graduating and who have abandoned credit in that program for the courses on the basis of which credit is sought, any number of courses may be credited.

(2) Candidates who have been given credit for courses listed in the table, in accordance with section 8(1), shall be regarded as having completed such courses for the purposes of these resolutions.

Admission to Honours courses

10. (1) In order to qualify for admission to an Honours course candidates shall have qualified for the award of a Pass degree and be considered by the Faculty and the head of the department concerned to have the requisite knowledge and aptitude for an Honours course.

(2) With the permission of the appropriate Head of Department and provided the requirements in subsection (1) have been satisfied Pass graduates in Medical Science of the Faculty of Science may also be admitted to Honours courses.

(3) Candidates may not take more than one Honours course in any one academic year.

(4) Candidates who have qualified for the Honours degree may take, in the next year or at such later times as the Faculty permits, an additional Honours course which they are qualified to enter.

Honours courses

11. (1) Candidates for the Honours degree shall complete an Honours course.

(2) There shall be an Honours course in the following subjects: Anatomy, Biochemistry (Molecular Biology), Biology (Genetics), Cell Pathology, Histology & Embryology, Immunology, Infectious Diseases, Microbiology, Pharmacology, Physiology.

Classes of Honours and Medal

12. (1) There shall be three classes of Honours, namely Class I, Class II, and Class III, and within Class II there shall be two divisions, namely Division 1 and Division 2.

(2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.

(3) There shall be no re-examination for Honours.

Table of courses for Bachelor of Medical Science [See section 3]

Course	Unit value	Prerequisites (P) Corequisites (C) Assumed knowledge (Ak)
A. Junior courses		
The following are qualifying courses for entry into the Intermediate year of the Bachelor of Medical Science.		**Ak:** See resolutions for the Faculty of Science
Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)[1]	12	
Chemistry 1 or Chemistry 1 (Advanced)	12	
Physics 1 or Physics 1 (Advanced)	12	
Biology 1 or Biology 1 (Advanced)	**12**	
B. Intermediate courses		
(i) Core Courses		Q:Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences), and Chemistry 1 or Chemistry 1 (Advanced), Physics 1 or Physics 1 (Advanced), and Biology 1 or Biology 1 (Advanced) (students who have completed Computer Science 1 or Computer Science 1 (Advanced), or Psychology 1, and not Biology 1 or Biology 1 (Advanced), may be granted permission to enrol in the degree)
Human Life Sciences 2	28	
Pharmacology 2 Introductory	8	
Biochemistry 2 (Medical Science) Auxiliary*	8	
(ii) Elective options (Select one)		
Biochemistry 2 (Medical Science) Practical*	8	Q:Chemistry 1 or Chemistry 1 (Advanced)
Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)	8	Q:Biology 1 or Biology 1 (Advanced)
History and Philosophy of Science 2 Introductory	8	
C. Senior courses		
(i) SI Core courses		Q:Human Life Sciences 2 P: Biochemistry 2 (Medical Science) or Biochemistry 2 (Medical Science) Auxiliary P: Pharmacology 2 Introductory
Microbiology and Immunology 3	10	
Human Life Sciences 3 (Cellular and Molecular)	4	
(ii) Whole year elective option		Q:Human Life Sciences 2 P: Biochemistry 2 (Medical Science) or Biochemistry 2 (Medical Science) Auxiliary P: Pharmacology 2 Introductory
Cell Pathology 3	24	
(iii) S1 Elective options (Select one option.** Departments may offer more than one option/ and may offer options jointly with other departments)		Q:Human Life Sciences 2 P: Biochemistry 2 (Medical Science) or Biochemistry 2 (Medical Science) Auxiliary P: Pharmacology 2 Introductory
Biochemistry 3 (Molecular Biology and Metabolism)	12	Q:Biochemistr.y 2 (Medical Science)
Biology 3 (Molecular Genetics and Recombinant DNA Technology)	12	Q:Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)
Histology 3 (Techniques)	12	
History of the Life Sciences 3	12	Q: History and Philosophy of Science 2 Introductory

'From 1994, General Pure Mathematics 1 has been renamed Mathematics 1 (Life Sciences). Any reference to Mathematics 1 (Life Sciences) in these resolutions shall be deemed to apply equally to General Pure Mathematics 1.

*Biochemistry 2 (Medical Science) Auxiliary plus Biochemistry 2 (Medical Science) Practical must be taken together as Biochemistry 2 (Medical Science).

**These elective options are not available for students enrolled in Cell Pathology 3.

Table of courses for Bachelor of Medical Science [See section 3] *(Continued)*

Course	Unit value	Prerequisites (P) **Corequisites (C)** **Assumed knowledge** (Ak)
Neuroscience 3	12	
Pharmacology 3 (Molecular Pharmacology and Toxicology)	12	
(iv) S2 Elective options (Select two options.# Departments may offer more than one option, and may offer options jointly with other departments).		Q:Human Life Sciences 2 P: Biochemistry 2 (Medical Science) or Biochemistry 2 (Medical Science) Auxiliary P: Pharmacology 2 Introductory
Anatomy 3 (Topographical)	12	
Biochemistry 3 (Physical and Macromolecular)	12	Q:Biochemistry 2 (Medical Science)
Biology 3 (Human, Developmental and Evolutionary Genetics)	12	Q:Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)
Histology 3 (Developmental Biology)	12	
Immunology 3	12	Students are advised not to attempt this course if they have not performed well in Microbiology and Immunology 3
Infectious Diseases 3 (Infection and Diagnosis)	12	C:Microbiology 3 (Molecular Biology of Pathogens)/ except with special permission of Department of Infectious Diseases. Students are advised not to attempt this course if they have not performed well in Microbiology and Immunology 3
Microbiology 3 (Molecular Biology of Pathogens)	12	Students are advised not to attempt this course if they have not performed well in Microbiology and Immunology 3
Neuroscience 3 (Advanced)	12	Students are advised not to attempt this course if they have not performed well in Neuroscience 3
Pharmacology 3 (Neuro- and Cardiovascular)	12	
Physiology 3 (Heart and Circulation)	12	

Note: Entry to Senior options may be subject to quotas, and the selection of combinations of Senior options will be subject to timetable constraints. ,
#Students enrolled in Cell Pathology 3 select only one of these options.

4 Talented Student Program

The Faculty offers a special program of study for exceptionally gifted students in the Talented Student Program (TSP) which operates mainly for those students in the BSc degree. The programis not available for the BMedSc or BPharm degrees, although if permission is granted by other faculties, TSP options may be taken for science courses which are part of other degree programs.

The aim of the program is to offer students of exceptional merit additional challenging material to enablement to maximise their intellectual growth and potential. The following guidelines apply generally, although Departments may have additional (andmore stringent) requirements for entry to the courses they offer in the program:

- to be considered for the program in their first year, students should normally have a TER (or equivalent) over 98 with marks of over 90 in relevant subjects areas;
- to be considered for the program in their second and third years, students should normally have SCIWAMs over 80 and a high distinction grade in the relevant subject area.

A major benefit of participation in the Talented Student Program is that students receive special supervision by academic staff and often engage in studies with small numbers of fellow students, all of whom have particular interest in the subject.

Senate Resolution 7(2) for the BSc degree authorises the Dean to give approval for students of exceptional merit to enrol in courses or in combinations of courses not normally available within the degree. For example, a student who takes Psychology 3 and who wishes to take additional options in psychology plus options in subjects related to biochemical aspects of behaviour may, following consultation with the departments concerned (e.g. Departments of Biochemistry and Psychology), take a special 24-unit course consisting of combinations of parts of existing courses.

In very exceptional cases, particularly for students who have excelled in Olympiad Programs, application of Resolution 7(2) may permit accelerated progress toward the completion of the BSc degree.

Studies undertakenin the TalentedStudentProgram are included separately on the student's academic transcript so that all potential employers are aware that the student has completed challenging courses of study.

All applications for entry to the Talented Student Programmustbemadeontneappropriateformwhich is available from the Faculty Office or the Departmental Talented Student Program Coordinator. Enrolment in the Program is subject to approval by the Dean.

Further information on the operation of the Talented Student Program may be obtained from the departmental coordinator or from the Undergraduate Clerk, Faculty of Science.

Examples of programs available for 1995

Agricultural Chemistry 3
Coordinator: Associate Professor Les Copeland

Students may undertake, in addition to normal coursework, a special research project directly supervised by a member of the academic staff.

Biochemistry
Coordinator: Dr Anthony Weiss

A special program of study will be developed for individual students enrolled in Biochemistry 2 and 3.

Biology 1
Coordinator: Associate Professor Bill Allaway

Students may undertake additional seminars and/or special project work. Some students meeting the criteria for admission to this program may be offered exemption from Biology 1 and be permitted to enrol in Biology 2 courses.

Biology 2
Coordinator: Associate Professor Bill Allaway

Students may undertake additional seminars and/or special project work.

Chemistry 1
Coordinator: Dr Raymond Pierens

The program comprises part of the Chemistry 1 (Advanced) lecture course supplemented by more advanced lectures and special project-based laboratory exercises.

Chemistry 2
Coordinator: Dr Scott H. Kable

Chemistry 2TSP offers lectures and laboratory material which complement the Chemistry 2 (normal) course. The course comprises 54 lectures on topics which are complementary to the Chemistry 2 lecture course, plus special project-based exercises.

Chemistry 3
Coordinator: Professor Hans Freeman

Chemistry 3TSP offers four 7-lecture modules (one per half-semester). Each module deals with the solution of a substantial problem in Chemistry. In addition, the normal Chemistry 3 laboratory program is modified to include special TSP experiments.

Computer Science
Coordinator: Dr Alan Fekete

The Department will make special arrangements for individual students throughout their studies. Interested students should contact the TSP coordinator as soon as possible.

Geography 2
Coordinator: Dr David Chapman

In lieu of some of the normal coursework students may undertake special project work on an environmental problem. Particular emphasis will be given to the enhancement of student capabilities in the areas of problem identification, problem formulation, data gathering, and analysis and reporting.

Geology and Geophysics
Coordinator: Professor Peter Davies

Students will be offered extra seminars and / or special project work.

Mathematics and Statistics
Coordinator: Associate Professor T. M. Gagen

Students admitted to the program have the following options available to them:
- additional options from courses in Mathematics and Statistics either in lieu of, or in addition to, other courses of study
- a combination of additional options from courses inMathematics and Statistics combined withspecial studies in another discipline
- a special research project in lieu of, or in addition to, normal course components
- various combinations of the above options.

Microbiology
Coordinator: Dr T. Ferenci

A special program of study will be developed for individual students enrolled in Microbiology.

Pharmacology
Coordinator: Dr Ian Spence

The Department will make special arrangements for individual student throughout their studies.

Physics 1
Coordinator: Dr David McKenzie

Students may take extra seminars and special laboratory project work in addition to or in lieu of parts of Physics 1 (Advanced).

Physics 2
Coordinator: Dr David McKenzie

Students may take extra seminars and special laboratory project work in addition to or in lieu of parts of Physics 2.

Physics 3
Coordinator: Dr David McKenzie

Students may take extra seminars and special research project work in addition to or in lieu of parts of Physics 3.

Psychology
Coordinator: Associate Professor Helen Beh

The program is available in Psychology 2 and Psychology 3.

Students admitted to the program have the following options available to them:
- additional options in Psychology either in lieu of, or addition to, other courses of study in Science (e.g. students may take an additional 4 options in Psychology and receive 12 units creditinPsychology for these units in. lieu of 12 units from another course or in addition to units in another course)
- a combination of additional Psychology options combined with special studies in another science discipline (e.g. Biochemistry, Computer Science, Mathematics and Statistics)
- a special research project in lieu of, or in addi tion to, normal practical or classwork components
- various combinations of the above options.

Soil Science 3
Coordinator: Associate Professor Alex McBratney

Students may undertake, in addition to normal coursework, a special research project.

5 Courses of study

Note: Courses and arrangements for courses, including staff allocated, as stated in this or any other publication, announcement or advice of the University are an expression of intent only and are not to be taken as a firm offer or undertaking. The University reserves the right to discontinue or vary such courses, arrangements or staff allocations at any time without notice.

Books
In this section of the handbook, books listed under the sub-heading *Textbooks* are those which students are expected to purchase, while all other books recommended for a course are listed under the sub-heading *Reference books.*

Changes sometimes occur in the selection of prescribed textbooks or reference books, owing to supply difficulties or the publication of new and more suitable works. Such changes will be announced by lecturers and it is prudent to check with the relevant lecturer before buying the books you expect to need.

Department of Agricultural Chemistry and Soil Science

AGRICULTURAL CHEMISTRY

Courses in agricultural chemistry for science students consist of aspects of chemistry and biochemistry which are relevant in studies of basic and applied biological sciences including agriculture and the environment. Emphasis is placed on the chemistry of molecules of biological, agricultural and environmental significance both naturally occurring (eg. cellular constituents, foods, natural fibres), and chemically synthesised (e.g. insecticides and herbicides). The biochemistry is planned around the relationship between living organisms and their environment and includes sections on the metabolism of inorganic and synthetic materials by animals, plants and micro-organisms.

The courses available are Agricultural Chemistry 2 (16-unit Intermediate), Agricultural Chemistry 3 (24-unit Senior) and Agricultural Chemistry Honours.

Location
The Department is in the Ross St Building.

Noticeboards
Noticeboards are located on the first floor and access is either from Agriculture Lane or Science Road.

Registration
All students should register at the Department's office before the commencement of lectures.

Advice on courses
The office will direct you to an appropriate member of staff.

Agricultural Chemistry 2 — 16 units

Dr Lees, Dr Caldwell, Assoc. Prof. Copeland
Qualifying course Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr: (3 lec & 5 prac)/wk
Assessment two 3hr exam, prac, assignment

The course introduces students to topics inbiophysical, bio-organic, biological and environmental chemistry. These topics include: energy in.the biosphere, the interaction of radiation and matter, the physical characterisation of large biomolecules, surfaces and interfaces; the organic chemistry of carbohydrates, amino acids and proteins, nucleotides and polynucleotides, vitamins, steroids, and plantpigments; principles of enzyme action; catabolism of proteins, carbohydrates, lipids and nucleic acids; respiration and energy metabolism; intermediary metabolism; nucleic acid metabolism and protein synthesis. Emphasis is also given to the theory, principles and practice of the basic analytical techniques which are a necessary prerequisite for the more advanced instrumental methods found in many laboratory based disciplines.

Textbooks
L. Stryer *Biochemistry* (Freeman, 1988)
R.T. Morrison and R.N. Boyd *Organic Chemistry* (Allyn & Bacon, 1983)

Agricultural Chemistry 3 — 24 units

Dr Kennedy, Dr Lees, Assoc. Prof. Copeland, Dr Caldwell
Classes Sem 1: (4 lec & 8 prac)/wk; Sem 2: (3 lec & 9 prac)/wk
Assessment two 3hr exam, assignment, prac

The course includes sections on the chemistry and biochemistry of cellular constituents (particularly in plants), metabolism of plant and soil nutrients, biochemistry of storage, transmission and expression of genetic information, enzymology, energy metabolism and the control of metabolic processes. There are also sections on the chemistry of biologically important macromolecules, environmental chemistry, chemistry of cereals and pulses, fibres from plants and animals, plant secondary products, herbicides and pesticides and aspects of food science.

Analytical methods used for the quality control of food and agricultural products and in environmental chemistry form an important part of the laboratory classes.

Textbooks and Reference books
To be advised

Agricultural Chemistry Honours

Candidates should consult the Department as soon as possible after Third Year results are obtained. The course consists of a research project (with submission of a report in the form of a thesis), a reading list and attendance at lectures and seminars. Researchinterests in the Department include carbohydrate and nitrogen metabolism in plants, polysaccharide structure,

biological nitrogen fixation in legumes and associated with wheat, insect metabolism, the biochemistry and environmental chemistry of pesticides and herbicides, acidification of ecosystems including the mechanism of aluminium toxicity, residue analysis in foods and other aspects of food science.

SOIL SCIENCE

The Soil Science courses offered by the Department of Agricultural Chemistry and Soil Science aim primarily at giving students an introduction to the three major branches of soil science, namely soil physics, soil chemistry, and pedology, and at providing the basis for a professional career in each of these divisions for students wishing to specialise.

The introductory course is particularly relevant for students interested in the environmental and geological sciences and in land-use management.

Location
The Departmental office is on the ground floor of the Ross St Building (A03). The Soil Science teaching laboratories are on the ground floor of the eastern wing of the Ross St Building, and are approached by a ramp and footbridge lying between the Watt and Ross St Buildings.

Noticeboards
Noticeboards are at the foot of the stairs at the entrance to the teaching laboratories in the Ross St Building.

Registration
All students are required to register with the Department before the first day of Semester 1 to discuss their programs and timetables with the Soil Science staff.

Advice on courses
Enquiries should initially be addressed to the Departmental office.

Tutorials
All students will be allocated to tutorial groups, which will normally be held during times allocated to practical classes.

Structure of courses
Soil Science 2 Auxiliary provides basic information and training in soil science topics. Soil Science 2 includes the Auxiliary Soil Science course and also provides expertise in laboratory methods, field survey methods, land evaluation and classification. This course is the qualifying course for entry into the Senior course Soil Science 3.

Soil Science 3 consists of four major components:

Advanced Soil Physics
Advanced Soil Chemistry
Advanced Methodology
Advanced Pedology

Soil Science 2 Auxiliary 8 units

Assoc. Prof. Koppi, Assoc. Prof. McBratney, Mr Geering
Prereq Chemistry 1 or Chemistry 1 (Advanced) and Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences) or Computer Science 1 or Computer Science 1 (Advanced)
Classes Sem 1: (4 lec & 4hr of prac) / wk & 1 excursion Friday pm
Assessment one 3hr exam, coursework, prac, prac report

This class is identical with Soil Science 2 (Second Year) in the Faculty of Agriculture.

Pedological, physical, chemical and biological aspects of the soil environment and their relationship to plant growth. The methodology of the determination of commonly measured morpho-logical, physical, chemical and mineralogical soil properties and biological techniques. The commoner methods of classification of soil and its usefulness for land evaluation. Experience in the determination and interpretation of soil properties in the field and the use of maps.

Reference books
N.C. Brady *The Nature and Properties of Soils* (Macmillian, 1991)
K.O. Campbell and J.W. Bowyer (eds) *The Scientific Basis of Modern Agriculture* (Sydney U.P., 1988)
Department of Microbiology. Course booklet
R.E. White *Introduction to the Principles and Practice of Soil Science* (Blackwell Scientific, 1987)

Soil Science 2 16 units

Assoc. Prof. Koppi, Assoc. Prof. McBratney, Mr Geering
Prereq Chemistry 1 or Chemistry 1 (Advanced) and Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences) or Computer Science 1 or Computer Science 1 (Advanced)
Classes Sem 1: (4 lec & 4hr of prac)/wk; Sem 2: (4 lec & 3hr of prac)/wk, 5 days fieldwork mid-year
Assessment two 3hr exams, lab, fieldwork

The lectures, practicals and field excursions in First Semester run concurrently with Soil Science 2 Auxiliary and with Soil Science 2 in the Faculty of Agriculture.

For details of first semester course see Soil Science 2 Auxiliary above. The second semester course outline is:

Lectures
Land-use requirements, pedological processes, classification of soils, soil survey, soil geomorphology and aerial photography and their application to land evaluation for rural purposes, together with an introduction to geostatistics. Processes affecting the movement of water and heat in soils and the effect of the soil physical environment on biological systems. The chemistry of plant nutrients and their availability and movement towards organisms under biologically induced gradients.

Practicals
The laboratory practical classes will concentrate on soil characterisation for resource assessment and involve the study of physical and chemical processes of soil degradation and amelioration.

Fieldwork
The fieldwork will take place at a country location during the mid-year break and involves the study of soil profiles, profile descriptions, aerial photo interpretation and elementary surveying. Field measurements will involve measurements of hydraulic conductivity and related soil properties.

Aim of the course
The aim of the course is to train students to be professionally competent in making agricultural land

use decisions and for assessing soil for growth of crops and pastures.

Reference books

S.A. Barber *Soil/ Nutrient Bioavailability: A Mechanistic Approach* (Wiley Inter-Science, 1984)

K.O. Campbell and J.W. Bowyer (eds) *The Scientific Basis of Modern Agriculture* (Sydney U.P., 1988)

D. Dent and A. Young *Soil Survey and Land Evaluation* (Allen & Unwin, 1981)

E.A. FitzPatrick *Soils* (Longman, 1980)

T.I. Marshall and I.W. Holmes *Soil Physics* (Cambridge U.P., 1988)

Soil Science 3 — 24 units

Assoc. Prof. McBratney, Assoc. Prof. Koppi, Mr Geering

Qualifying course Soil Science 2

Prereq Chemistry 2 or Agricultural Chemistry 2 or Biochemistry 2

Classes Yr: (4 lec & 8hr of prac)/wk, 5 days fieldwork prior to Sem 1, 5 days fieldwork in Sem 1 break

Assessment four 2hr exam, coursework, prac

This course follows Soil Science 2. It has four major components that develop the concepts introduced in Soil Science 2: Advanced Soil Physics, Advanced Pedology, Advanced Methodology, Advanced Soil Chemistry. The four parts, which are taught in half-semester modules, include lectures, seminars, problem sets and both laboratory and field programs.

Reference books

S.A. Barber *Soil Nutrient Bioavailability* (Wiley, 1984)

E.A. FitzPatrick *Soils* (Longman, 1980)

E.A. FitzPatrick *Micromorphology of Soils* (Chapman & Hall, 1984)

D.J. Greenland and M.H.B. Hayes *The Chemistry of Soil Constituents* (Wiley 1978)

D. Kirkman and W.L. Powers *Advanced Soil Physics* (Wiley 1972)

J. Loveday (ed.) *Methods for Analysis of Irrigated Soils* (C.A.B. 1974)

P.H. Nye and P.B. Tinker *Solute Movement in the Soil Root System* (Blackwell Scientific, 1977)

J. Richler *The Soil as a Reactor* (Catena Verlag, 1987)

G. Sposilo *The Chemistry of Soils* (Oxford, 1989)

Soil Survey *Staff Soil Taxonomy: A Basic System of Soil Classification for Making and Interpreting Soil Surveys*,Agric Handbook No. 436 (U.S. Department Agric, Washington D.C., 1975)

Soil Science Honours

This course consists of several parts:

(i) Supplementary lectures and seminars.

(ii) Courses selected from Agricultural Chemistry, Biometry, Botany, Geology, Physical Chemistry, Mathematics, Soil Mechanics, Soil Microbiology, etc.

(iii) A small amount of field work performed under direction.

(iv) A project in one branch of soil science.

Department of Anatomy and Histology

Location

The Department is in the Anderson Stuart Building. The Department Office is on the ground floor, Room 219.

Noticeboards

The noticeboards are situated next to the Department Office, Room 219, and near Rooms 223 and 331. **Students are advised to consult the noticeboards regularly.** Timetables for lectures and practical classes will be posted, where possible, in the week before the beginning of each Semester.

Advice on courses and enrolment

Students wishing to enrol in courses in Anatomy and Histology must consult the Departmental advisers in the Enrolment Centre duringre-enrolmentweek prior to enrollingin the courses. Information will be available at this time on the courses offered by the Department and on the advisability of various combinations of subjects.

Registration

All students should register with the Department. **Please consult the Departmental noticeboards for details.**

ANATOMY

Anatomy is not currently available to BSc students who first enrolled after 1991.

Anatomy 2 Introductory — 8 units

See 1994 Faculty of Science Handbook, pp. 60-61 or consult Department for details of this course.

Anatomy 3 — 24 units

See 1994 Faculty of Science Handbook, p. 61 or consult Department for details of this course.

Anatomy Honours and Graduate Diploma

This course provides the opportunity for the student to do research on a project supervised by a member of staff. Assessment is based on a thesis summarising the results of the year's research. To qualify for this course the student must obtain an appropriate standard in Anatomy 3 or Neuroscience 3.

HISTOLOGY

Histology is not currently available to BSc students who first enrolled after 1991.

Histology 2 Introductory — 8 units

See 1994Faculty of Science Handbook, p. 61 or consult Department for details of this course.

Histology 3 — 24 units

See 1994 Faculty of Science Handbook, p. 61 or consult Department for details of this course.

Histology Honours and Graduate Diploma

Histology Honours may be taken by students who have completed to the required standard at least one of the Semester options in Histology offered by the Department of Anatomy and Histology in the Third Year of the BMedSc degree. Students who have taken only one of the Semester options may be restricted to

particular Honours projects that are related to that option.

Students who have completed Histology 3 in the BSc degree will have completed both Semester components of the course and will therefore be eligible to undertake Histology Honours subject to the usual Faculty regulations.

Higher Degrees

The degrees of Master of Science, Master of Medicine and Doctor of Philosophy by research are offered by the Department of Anatomy and Histology. There are no higher degrees by coursework.

Department of Biochemistry

The Department teaches biochemistry to Science students, as well as to students inMedicine, Veterinary Science, Dentistry and Pharmacy and Chemical Engineering.

Biochemistry 2 (16 units) provides a basic course for (a) students who wish to do only one year's study in the subject and (b) for students who wish to continue on to the Senior course, Biochemistry 3 (24 units). An honours course designed for those wishing to enter research or to undertake work leading to a higher degree is conducted in the fourth year.

An alternative Intermediate course in Biochemistry is an 8-unit Auxiliary course.

Location

The Biochemistry Building (G08) is across City Road in the Darlington area behind the WentworthBuilding. General enquiries should be directed to the Department Office on level 6 (Room 632).

Noticeboards

Noticeboards are in the foyer, level 3, and the practical laboratories relevant to each year of the course, viz:

Biochemistry 2 —- laboratory 380
Biochemistry 3 — laboratory 400

Registration

All Third Year students (including those repeating a course, and irregular students) are required to register with the Department, *during the orientation period.* Students will then be allocated the two days of the week on which to attend practical classes.

Students who attempt to register *after* the orientation period may find that they cannot be allocated to a particular practical class.

Advice on courses

Members of staff are normally present among faculty advisers during the enrolment period. Departmental advisers listed in the handbook are available in the Department during the period prior to enrolment and during orientation.

Biochemistry 2 16 units

Assoc. Prof. Jones, Assoc. Prof. Ralston, Dr Weiss, Mrs Loke
Qualifying course Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr: (3 lec & 5 prac)/wk
Assessment one 3hr exam/sem, one 2hr prac exam/sem, practical reports

The lecture course introduces the principles of the structure, replication and metabolic function of living systems. The course in the first semester concentrates on the structure and functions of proteins and enzymes, and with the subject of molecular biology — which encompasses the structure, replication and expression of genetic material — and protein synthesis. The second semester is concerned with the degradation of dietary 'fuels' and how the degradation products are used as the raw materials for both the synthesis of new compounds and as providers of energy for the cell.

The first part of the first semester deals with amino acids, proteins and enzymes. The function and mechanism of action of enzymes is examined in the light of their structures — the chemistry of the amino acids, the peptide bond and peptide analysis, the sequence of amino acids (primary structure), the way that the chain of amino acids may form regular folding patterns (secondary structure), the overall three-dimensional (tertiary) structure and the manner that some protein molecules may associate to make large complexes (quaternary structure). The functions of the oxygen-binding proteins myoglobin and haemoglobin, and of the fibrous protein collagen, are examined in detail and their functions related to their structures. The rest of the Semester deals with molecular genetics commencing with the 'central dogma' of gene expression involving the flow of information from DNA to RNA to protein. The structure and function of DNA, copying of DNA, transcription of DNA to make RNA, the genetic code and polypeptide production by translation are described in detail. The overall process is elegantly controlled and involves control regions and precise effectors and an understanding of these events leads to a description of the key aspects of recombinant DNA technology — restriction enzymes, sequencing of DNA, Southern transfer, plasmid cloning, the construction of recombinant DNA molecules, transformation of bacterial cells and an overview of methods used in isolating genes and genetic engineering.

The second semester begins with anintroduction to membrane structure and function, the components of membranes, their structures, participation in inter-mediary metabolism and cellular compartmentation. This leads to ATP as the universal carrier of metabolic energy, NAD^+, $NADP^+$ and FAD as the carriers of electrons, mitochondrial structure and its function in electron transport, oxidative phosphorylation and the generation of ATP. Carbohydrate chemistry and structure precedes the digestion and absorption of mono-, di- and poly-saccharides, their conversion to glucose and the degradation of glucose to pyruvate. The fates of pyruvate are examined as are the synthesis and storage of glucose, the control of glucose metabolism by hormones and the tricarboxylic acid cycle in the oxidation of acetyl CoA. Lipid metabolism involves a description of the classes of lipids, their digestion and synthesis, the production of energy from fatty acids, the structure and function of cholesterol, the bile salts, the sex and other steroid hormones. Integration of carbohydrate and lipid metabolism comprises the metabolic profiles of muscle,

liver, brain, adipose tissue and the red blood cell and metabolic control in the fed state, during starvation, under stress, in exercise, during fright and with diabetes mellitus. The metabolism of nitrogen compounds is concerned with the ingestion and digestion of proteins and nucleic acids, the reactions that allow interconversion of some amino acids, the degradation of amino acids with the excretion of nitrogen and the recycling of the carbon skeletons, the assimilation and metabolism of ammonia and the synthesis of amino acids. The synthesis and degradation of the components of nucleic acid is detailed and the relevance of these types of reactionis discussed in relation to the control of cancer.

The practical component of the course will familiarise the student with the standard analytical techniques which are fundamental to experimental biochemistry. These involve the identification and quantification of specific compounds in biological materials.

Practical classes are computer allocated and are on the timetable issued during orientation week. Alterations will not be made except to accommodate a change of subjects.

Textbooks
Either
L. Stryer *Biochemistry* (Freeman, 1988)
or
C.K. Mathews and K.E. van Holde *Biochemistry* (Benjamin/Cummings, 1990)
and
P.W. Kuchel and G.B. Ralston *Schaum's Outline of Theory and Problems of Biochemistry* (McGraw-Hill, 1988)

Biochemistry 2 Auxiliary 8 units

Assoc. Prof. Jones, Assoc. Prof. Ralston, Dr Weiss
Qualifying course Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr: 3 lec/wk
Assessment one 3hr exam/sem

This is a terminating course suitable for students who are majoring in other aspects of biology and who wish to acquire a background knowledge of biochemistry.

Students attend the same lectures as those enrolled in Biochemistry 2(16 units). There is no practical work component.

Textbooks
Either
L. Stryer *Biochemistry* (Freeman, 1988)
or
C.K. Mathews and K.E. van Holde *Biochemistry* (Benjamin/Cummings, 1990)
and
P.W. Kuchel and G.B. Ralston *Schaum's Outline of Theory and Problems of Biochemistry* (McGraw-Hill, 1988)

Biochemistry 3 24 units

Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff
Qualifying course Biochemistry 2
Classes Yr: (4 lec & 8 prac)/wk
Assessment one 3hr & one 2hr theory exam/sem, one 1.5hr prac exam/sem, practical work

The lecture course consists of core and option components. The practical course is designed to complement the lecture course and to provide students with experience in a wide range of techniques currently used in biochemical and molecular biology laboratories.

First semester core lectures
The first semester core lectures are in four broad areas: molecular biology, immunology, metabolism and physical biochemistry. The molecular biology section is the most extensive and covers molecular cloning and analysis of nucleic acids (including DNA structure and sequencing, the enzymes used in molecular cloning and nucleic acid analysis, analysis of RNA and the basis of molecular cloning) and chromosome structure and replication in eukaryotes. The immunology covers the use of monoclonal antibodies in immunoassays, the general nature of the immune system, and the protein chemistry and molecular biology of immunoglobulins. The metabolism part of the course covers the regulation of metabolic pathways, hormone action, and the biochemistry of exercise. The physical biochemistry component is concerned with the physical nature of macromolecules and methods for studying them.

First *semester option lectures*
The first semester lecture course contains two 6-lecture option series. The options available in first semester will include some of the topics listed below. Those topics in this list which are not available in the first semester will be offered in the second semester option lecture series.

Second semester core lectures
The second semester core lectures cover three broad areas: enzymology, membranes and membrane-related phenomena and eukaryote molecular biology. The enzymology section includes steady-state enzyme kinetics, allosterism, mechanisms of enzyme-catalysed reactions, and examples of the use of modern biophysical and molecular biology techniques in studying enzymes. The lectures on biological membranes include discussions of the biochemical basis of vision, photosynthesis and the role of membranes in energy transduction. The eukaryote molecular biology lectures are concerned with gene expression and control in eukaryotes.

" *Second semester option lectures*
The second semester lecture course includes four 6-lecture option series. The topics offered will be those listed below which were not available in the first semester option lecture series.

Option lecture topics
The vitamins: anti-oxidants, enhancers for gene transcription, cofactors in the enzymology of metabolism
The macronutrients: proteins, fats and carbohydrates
Cancer: oncogenes and the cell cycle
Experimental and clinical approaches to cancer treatment
The biochemistry of neutrophils in health and disease
The biochemistry of heart disease: atherogenesis, lipoproteins and reactive vessel walls
Enzyme kinetics
The biochemistry of insulin
Cellular immunology

The biology of immune complexes
Structure, functions and design of macromolecule
Molecular biology of development
Xenobiotica
NMR spectroscopy: an insight into biomolecular structure and function
Looking inside cells with NMR: basics
Looking inside cells with NMR: clinical aspects
Dynamic changes in cell architecture
The cytoskeleton: its role in disease, signal transduction and metabolism
Macromolecular interactions: self-association of proteins
Macromolecular interactions: interaction of proteins with other proteins and other molecules
Nutrition: inorganic elements
Lipoproteins
Insect biochemistry
The extracellular matrix: the dynamic structure of the vertebrate body
The cytoskeleton: dynamic engineering in eukaryote cells
Molecular biology of the bacterial cell cycle
Medical molecular biology

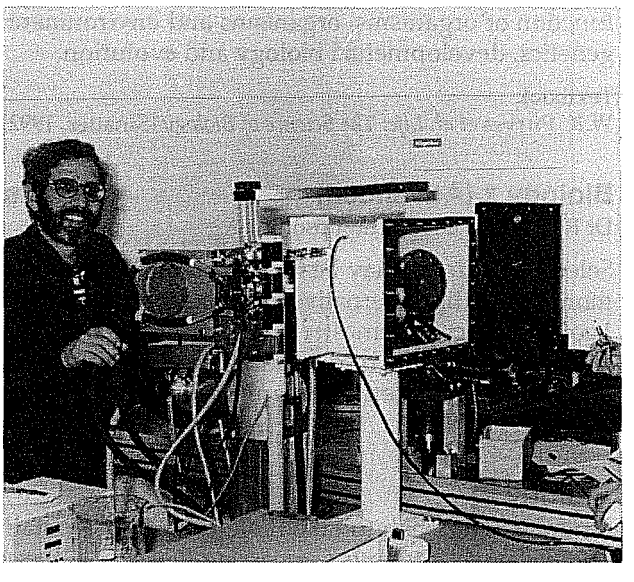
Textbooks
B. Lewin *Genes V* (Oxford U.P., 1994)
B.R.Glick and J.J.Pasternak *MolecularBiotechnology:Principles & Applications of Recombinant DNA* (ASM Press, 1994)
and either
C.K. Mathews and K.E. van Holde *Biochemistry* (Benjamin/ Curnmings, 1990)
or
L. Shyer *Biochemistry* (Freeman, 1988)

Biochemistry Honours

The course runs from about mid-February until mid-November. It provides the opportunity for research on a project supervised by a particular staff member, as well as the study of advanced and developing aspects of Biochemistry. During the year each student is required to write one essay, for which there is a choice of topics. Assessment of the year's work is based largely on the student's performance on the research project, and a Written report on the project. During the second semester of the Biochemistry 3 course students are invited to apply for permission to enrol in the Honours course and are provided with a list of possible research projects. Potential research topics currently offered to students include:
Anticancer drugs: synthesis and mechanism of action.
Biochemistry of cellular signal transduction
Kinetics of enzymic reactions
The cause of diabetes and/or obesity; fuel metabolism during exercise
Structure and function of clusterin, a molecule implicated in programmed cell death
Computer-aided design and enzymological testing of potential anticancer drugs
Metabolic pathways in boar spermatozoa
NMR studies of the solution structure of vasoactive peptides and DNA binding proteins
NMR studies of membrane transport and metabolism in cells
Protein interactions of the red cell cytoskeleton
Thermodynamics of pro tein association reactions and analytical ultracentrifugation
Bioavailability of trace elements and biochemical indicators of their nutritional status
Cellulose digestion and nitrogen metabolism in termites and cockroaches
Studies on the collagens of marsupials
The effect of fibre on blood and urinary estrogens
Chromosome replication and cell division in bacteria
Molecular biology of humans and yeasts
Construction of synthetic promoters to study tissue—specific gene expression in mice
Mechanism of modulation of protein function by the oligosaccharide chains of glycoproteins
Nutrition and cardiovascular risk factors
Effects of dietary fatty acids on platelet function
Glycaemic index of foods; oligosaccharides in human milk

Students must arrange to speak with potential supervisors. An application form is attached to the list of possible research projects provided to students and they are asked to provide the names of at least four supervisors in order of preference. A decision on the Honours intake is made before Christmas. An attempt is made to assign students to the supervisor of their choice but this will not always be possible. In difficult cases there is further discussion with the student.

The minimum requirement for acceptance into the course is a pass at the Credit level in Biochemistry 3. However,itshould be keptin mind thatin determining the grade of Honours to be awarded at the end of the Honours year, the level of attainment in the first three years of theundergraduate course is takeninto account. The Department is therefore reluctant to accept students into the Honours course where there is little evidence of merit in subjects other than Biochemistry. Itshould be noted thatthe number of students accepted into the Honours course may be limited because of resource restrictions (e.g. availability of a supervisor and/or laboratory space) and that, in the event of there being more applicants than resources will allow, offers will be made on the basis of academic merit.



Investigating molecular structure using X-ray crystallography: a new development in biochemistry.

School of Biological Sciences

First Year

Location
Carslaw Building, near the bridge over City Road. The Biology Office is Room 512 on the 5th floor; the laboratories are on the 3rd floor.

Noticeboards
The noticeboards are located outside Laboratory 4 on the 3rd floor.

The noticeboards in the laboratories are in frequent use. Students should make a habit of looking at these each time they enter a laboratory.

Registration
All students are required to register with the Department during the first or second practical class of first semester.

Advice on courses
Members of staff are normally present among Faculty Advisers during enrolment week. Any student needing advice before enrolling should make an appointment to see a Departmental adviser.

Assistance during semester
The offices of the Biology staff are on the 5th floor of Carslaw. Students can make appointments by signing the form on the door of the offices of members of the teaching staff. Students are strongly advised to get acquainted with the teaching staff and to use this service.

Second and Third Years, Honours

Location
Buildings A08 and A12.

Biology 1 — 12 units

Ak biology section of the science 3-unit course
Classes Yr: (3 lec & 3 prac)/wk -
Assessment one 2hr exam & one prac exam/sem, classwork

The course gives an introduction to six main areas of biological investigation: cell biology, structure and function of organisms, organisms and environment, genetics, developmental biology and evolution.

Textbook
W.K. Purves *et al. Life: The Science of Biology* (Sinauer, 1992)

Biology 1 (Advanced) — 12 units

Dr R. Overall/Dr M. Thompson

Selected students may be invited to participate in a more demanding alternative component of the Biology 1 course in second semester. The content and na hire of this component will be determined each year. Details and selection criteria are announced in the first semester.

Biology 2

Students who wish to take Biology 2 should obtain *Information for Students Considering Biology 2 Courses* from Carslaw Lecture Room 3A during the Faculty of Science enrolment period or from the School Office (Room 234, Macleay Building, A12) after the enrolment period. They should discuss their preference of courses, together with the other subjects they propose to study, with a Biology staff member when enrolling.

The following Second Year courses are offered:

Group 1
Biology 2 (Animals)
Biology 2 (Animals) (Advanced)
Biology 2 (Animals — Theory) Auxiliary

Group 2
Biology 2 (Plant Anatomy & Physiology) Auxiliary
Biology 2 (Plant Anatomy & Physiology) Auxiliary (Advanced)

Group 3
Biology 2 (Plant Ecology & Diversity) Auxiliary
Biology 2 (Plant Ecology & Diversity) Auxiliary (Advanced)

Group 4
Biology 2 (Molecular & General Genetics) Auxiliary
Biology 2 (Molecular & General Genetics) Auxiliary (Advanced)
Biology 2 (Genetics Cellular & Developmental) Auxiliary

Group 5
Biology 2 (Cellular & Developmental) Auxiliary
Biology 2 (Cellular & Developmental) Auxiliary (Advanced)
Biology 2 (Genetics Cellular & Developmental) Auxiliary

Group 6
Entomology 2 Introductory

A maximum of 32 units may be taken in Biology 2, and one course may be taken from each group. In satisfying the Faculty requirement for credit in 32 units of Intermediate Normal or Long courses, a candidate may include combinations of an 8-unit first semester Biology 2 Auxiliary course and an 8-unit second semester Biology 2 Auxiliary course as equivalent to Interxmediate Normal (16 unit) courses. Qualifying courses for certain Biology 3 options will be defined as combinations of 8-unit Biology 2 Auxiliary courses (see *Information for Students Considering Biology 2 Courses).*

Entomology 2 Introductory
This is an 8-unit second year course offered jointly by the School of Biological Sciences and the Faculty of Agriculture. Biology 2 (Animals), Biology 2 (Animals) (Advanced) or Biology 2 (Animals—Theory) Auxiliary is a corequisite of this course.

Biology 2 (Animals) — 16 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Prereq Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr: (3 lec, 1 discussion group & 3 prac)/wk *or* (4 lec & 3 prac)/wk and one field trip/yr
Assessment one 3hr exam and 1 prac exam/sem, field report, 2 essays, quizzes

This course provides a thorough grounding in the diversity of animals by lectures, examining the

functional anatomy of animals by dissection and illustration in laboratory classes and in the field with anintensive 3.5 day field trip. Lectures and discussion groups further explore concepts of evolution, phyiogeny and animal function. This is a qualifying course for most animal modules in Biology 3.

Biology 2 (Animals) (Advanced) 16 units

Course coordinator Biology 2 (Animals) Course Executive Officer.

Selected students may be invited to participate in alternative components of the Biology 2 (Animals) course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

Biology 2 (Animals — Theory) Auxiliary 8 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Classes Yr: (3 lec & 1 prac)/wk
Assessment one 3hr exam/sem, quizzes

This is a terminating course that offers students exposure to the diversity of animals, but is suitable for students who are majoring in other areas of biology or other subjects but who wish to acquire a broad background in animal biology. The diversity, morphology and evolution of invertebrate and vertebrate animals are presented over two semesters. The course provides a broad background in the diversity of animals and an introduction to phyiogeny through lectures and demonstration material in laboratory classes.

Biology 2 (Plant Anatomy and Physiology) Auxiliary (S1) 8 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Classes Sem 1: (2 lec, 1 prac/audiovisual & 1 tut)/wk
Assessment one 2.5hr exam, 1 prac exam, project, classwork

The internal and external structure of plants is discussed in relation to functions of photosynthesis, translocation, water transport and nutrition. Self-instructional audiovisual study is augmented by lectures, group discussions and laboratory experiments.

Biology 2 (Plant Anatomy & Physiology) Auxiliary (Advanced) 8 units

Course coordinator Biology 2 (Plant Anatomy & Physiology) Auxiliary Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 2 (Plant Anatomy and Physiology) course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

Biology 2 (Plant Ecology and Diversity) Auxiliary (S2) 8 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Classes Sem 2: (2 lec, 1 prac/audiovisual & 1 tut)/wk
Assessment one 3hr exam, 1 prac exam, one 1000w essay, classwork

The ecology and function of plants in a natural environment are considered and their distribution discussed. The diversity and identification of algal protists, fungi and plants is studied. Practical aspects are covered in the laboratory, audiovisual sessions, discussions and a field trip. Each student is required to make a plant collection.

Biology 2 (Plant Ecology & Diversity) Auxiliary (Advanced) 8 units

Course coordinator (Plant Ecology & Diversity) Auxiliary Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 2 (Plant Ecology and Diversity) course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

Biology 2 (Molecular and General Genetics) Auxiliary (S1) 8 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Prereq Chemistry 1 or Chemistry 1 (Advanced)
Classes Sem 1: (3 lec, 1 tut & 4 prac)/wk
Assessment one 3hr exam, one 2hr theory of practical exam, assignments, pracs

An introduction to genetics in lower and higher organisms and to recombinant DNA analysis. Topics including DNA and RN A, chromosome structure and function, gene transmission and regulation, genetic engineering, and populationand evolutionary generics are covered in lectures, tutorial and laboratory classes. The combination of this course with the 8-unit auxiliary S2 course Biology 2 (Cellular and Developmental) is recommended. This course, together with any other 8-unit Biology 2 course, may be counted as equivalent to a 16-unit Intermediate course and as the qualifying course for Generics options in Biology 3. It may not be counted with Biology 2 (Genetics, Cellular and Developmental) Auxiliary. The lecture and tutorial component of this course forms the first semester of Biology 2 (Genetics, Cellular and Developmental) Auxiliary.

Biology 2 (Molecular & General Genetics) Auxiliary (Advanced) 8 units

Course coordinator Biology 2 (Molecular & General Genetics) Auxiliary Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 2 (Molecular and General Genetics) course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

Biology 2 (Cellular and Developmental) Auxiliary (S2) 8 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Prereq Chemistry 1 or Chemistry 1 (Advanced)
Classes Sem 2: (3 lec, 1 tut & 3-4 prac hrs)/wk
Assessment one 3hr theory exam, one 2hr theory of prac exam, pracs & assignments

A course on cell biology and development in plants and animals, emphasizing the functioning of the cell and favouring the molecular perspective. Topics include cell and organelle structure and function, cellular development and differentiation, and embryonic development. The course is given by means of lectures, tutorials, discussion groups and laboratory classes. The course leads into Cell Biology options in Biology 3. The course is designed to complement Biology 2 (Molecular and General Genetics) (Auxiliary). Students intending to major in areas of Genetics Cell Biology or Development are advised to take this combination. It may not be counted with Biology 2 (Genetics, Cellular and Developmental) Auxiliary, which is a two-semester 8-unit theoretical version of this course and Biology 2 (Molecular & General Genetics) Auxiliary (forstudentsnotintending to major in these areas).

Biology 2 (Cellular and Developmental) Auxiliary (Advanced) 8 units

Course coordinator Biology 2 (Cellular and Developmental) Auxiliary Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 2 (Cellular and Developmental) course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

Biology 2 (Genetics, Cellular and Developmental) Auxiliary 8 units

Biological Sciences staff
Qualifying course Biology 1 or Biology 1 (Advanced)
Prereq Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr: (3 lec & 1 tut)/wk
Assessment two 3hr theory exams, assignments

This course provides a solid theoretical foundation in genetics, cellular and developmental biology. Topics include DNA, RNA, chromosome structure and function, the nature of genetic change, gene transmission and regulation, recombinant DNA technology, cell and organelle structure and function, cellular development and differentiation, and embryonic development. The course is presented in the form of lectures and tutorials only; there are no practical classes. The course is not suitable for students continuing with genetics, cell biology or development options in third year, for which Biology 2 (Molecular and General Genetics) Auxiliary, Biology 2 (Molecular and General Genetics) Auxiliary (Advanced), Biology 2 (Cellular and Developmental Auxiliary or Biology 2 (Cellular and Developmental) Auxiliary (Advanced) are appropriate. The course may not be counted with Biology 2 (Molecular and General Genetics) Auxiliary, Biology 2 (Molecular and General Genetics) Auxiliary (Advanced) or with Biology 2 (Cellular and Developmental) Auxiliary or Biology 2 (Cellular and Developmental) Auxiliary (Advanced).

Entomology 2 Introductory 8 units

Assoc. Prof. McDonald, Dr Rose, Dr Meats
Qualifying course Biology 1 or Biology 1 (Advanced)
Prereq Chemistry 1 or Chemistry 1 (Advanced)
Coreq Biology 2 (Animals), Biology 2 (Animals) (Advanced) or Biology 2 (Animals — Theory) Auxiliary
Classes Sem 2: (3 lec & 1 prac)/wk
Assessment one 3hr exam, one 2000w essay, one insect collection

Morphology and classification, physiology, ecology, principles of control, toxicology of insecticides and biology of the major economic pests in New South Wales. The practical classes supplement the lectures and give students a working knowledge of the major orders of insects and economic species in New South Wales. Students will be required to make a small collection of insects to complement the practical work in this course.

Biology 3

Students who intend to proceed from Biology 2 to Biology 3 must:

(a) obtain *Information for Students Biology* 3 from the School Office (Room 234, Macleay Building, A12). This booklet gives detailed synopses of all options in the course.
(b) discuss their choice of subjects with a Biology staff member when enrolling.
(c) register in Room 227 (Building A08) during the first week of first semester.

Two courses are available:

Biology 3 24 units
Biology 3 Additional 24 units

Qualifying courses A minimum 16 units of non-terminating Biology 2 courses. Individual Biology 3 and Biology 3 Additional modules may have specific qualifying courses (check under each module description below)
Classes Yr: (4 lec/tut and 8 prac)/wk
Assessment exam, assignments, prac/sem

Options — general rules

Biology 3 and Biology 3 Additional may each be made up by combinations of options, depending upon the qualifications and interests of the student. A single 24-unit course shall be called Biology 3. A double 48-unit course shall be called Biology 3 and Biology 3 Additional. The courses offered in Biology 3 are arranged as a series of seven options, four of which are comprised of an obligatory core and a number of elective modules.

The options are:

Semester 1

110 Ecophysiology	Timetable 1
120 Evolution and Diversity of the Australian Biota	Timetable 2
125 Entomology	Timetable 2
130 Molecular Genetics and Recombinant DNA Technology	Timetable 3

Semester 2

210 Cellular and Molecular Physiology — Timetable 1
220 Ecology — Timetable 2
230 Eukaryotic Genetics and Development — Timetable 3

Students doing Biology 3 must select one option per semester. Students doing Biology 3 Additional must select a second option per semester. An option may involve an obligatory core and one associated module. Any combination of options may be chosen subject to timetable and qualifying course constraints. Modules in any option are only available if the core part of the course has been taken first. Cores cannot be taken without being followed by an associated module. An exception to this rule applies to Marine Science students who have chosen to do only six units of Biology 3 in first semester. In this case, students may take either the Evolution and Diversity of the Australian Biota core or the Marine Biology option (first semester) in isolation from the other.

When part-time students take 48 units over two years, the first set of 24 units taken shall be called Biology 3 and the second set shall be called Biology 3 Additional. The unit values of each option = 12 (core = 6, module = 6).

Options and places in options are offered subject to availability of staff, student numbers and resources. Quotas may therefore be imposed on any Biology 3 option (core or module) from time to time and, in that event> entry would normally be based on academic performance.

Marine Science students must do 24 units of Marine Science but are allowed to take from 6 to 18 units of Biology options (marked MS below) as *part* of the Marine Science course. If these options are taken as part of Marine Science they may not be counted towards Biology 3 or Biology 3 Additional.

Timetable 1

110 Ecophysiology
111 Animal Ecophysiology module
112 Plant and Fungal Ecophysiology module
210 Cellular and Molecular Physiology
211 Animal Physiology module
212 Plant Cells and Molecules module

Timetable 2

120 Evolution and Diversity of the Australian Biota
121 Plant Diversity and Biogeography module
122 Protistology module
123 Biology of Terrestrial Vertebrates module
124 Marine Biology module
125 Entomology
220 Ecology
221 Marine Ecology module
222 Terrestrial Ecology module
223 Plant Ecology module

Timetable 3

130 Molecular Genetics and Recombinant DNA Technology
230 Eukaryotic Genetics and Development

Locations of lectures and practical classes are given in the booklet *Information for Students Biology 3.*

Selecting course options

Select your core and associated modules after (a) checking that you have passed the qualifying courses stated for each of the modules listed below, and (b) checking your timetable. You are strongly advised to check the most up-to-date information on options in the booklet *Information for Students Biology 3,* available from the School Office in Room 234, Building A12.

Textbooks and reference books

A list of textbooks and reference books is provided in the booklet *Information for Students Biology 3* obtainable from "the School Office in Building A12

110 Ecophysiology — 12 units

Assoc. Prof. Allaway, Assoc. Prof. Armati, Prof. Hume, Dr McGee, Dr Thompson and others

Qualifying courses apply to modules

Classes Sem 1: (4 lec and 8 prac)/wk, one 3-day field course in Easter break. Timetable 1

Assessment one 1.5hr exam, assignments

Core'

The core covers general physiological interactions between organisms and their environments. The range of environments inhabited by organisms is outlined and the influence of important environmental parameters, including temperature, water, salt, pH, and respiratory gases, is investigated. Physiological interactions between animals, plants and fungi are discussed. The six-week core is followed by one of two modules, Animal Ecophysiology or Plant and Fungal Ecophysiology.

111 Animal Ecophysiology module

Assoc. Prof. Armati, Prof. Hume, Dr Thompson and others

Qualifying course Biology 2 (Animals) or Biology 2 (Animals) (Advanced)

Classes Sem 1: (4 lec and 8 prac)/wk. Timetable 1

Assessment one 1.5hr exam, field trip exam, lab. assignments

Animal Physiology builds on the core to explore aspects of ecophysiology of animals in detail. Topics covered include endocrinology, reproductive physiology, thermal biology, water and salt balance, scaling, metabolism and energetics of locomotion. The focus is on vertebrates, but invertebrate examples are used also. Laboratory classes form an important part of the course.

112 Plant and Fungal Ecophysiology module

Assoc. Prof. Allaway, Assoc. Prof. Larkum, Dr McGee and others

Qualifying courses 1995: any Biology 2.1996: either Biology 2 (Plant Anatomy and Physiology) Auxiliary, Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced), Biology 2 (Cellular and Developmental) Auxiliary or Biology 2 (Cellular and Developmental) Auxiliary (Advanced)

Classes Sem 1: (4 lec and 8 prac)/wk. Timetable 1

Assessment one 1.5hr exam, project

Plant and Fungal Ecophysiology is concerned with understanding mechanisms that determine the function of plants and/or fungi in theirenvironment. In this option, we examine plants from different environments and, in particular, their interaction with fungi. We are concerned with the reaction of plants/

fungi and plant/fungal associations to environmental stress and how we assess the importance of these factors on plant growth and development.

120 Evolution and Diversity of the Australian Biota 12 units (MS)

DrHenwood,DrHinde,DrHoegh-Guldberg,DrKingsford, Assoc. Prof. Larkum, Prof. Patterson, Prof. Shine, Dr Taylor and others

Qualifying courses apply to modules

Classes Sem 1: (4 lec and 8 prac)/wk. Timetable 2

Assessment one 1.5hr exam, assignments, projects

Core

The core takes as its theme the 'uniqueness' of the Australian aquatic and terrestrial biota. Students will be exposed to current concepts (and the theories upon which they are based) concerning the origin, evolution and recognition of various components of the Australian biota including protists, plants and animals. Evolution and diversity will be major themes of the course. The lecture series will be complemented by a laboratory component in which students will be given the opportunity to gain experience of Australian organisms and the analytical techniques employed to study them. The core will prepare students for one of a number of modules that will permit the study of various aspects of the Australian biota at a deeper level.

121 Plant Diversity and Biogeography module

Dr Henwood, Dr Taylor and others

Qualifying course Biology 2 (Plant Ecology and Diversity) Auxiliary or Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)

Classes Sem 1: (4 lec and 8 prac)wk, field courses. Timetable 2

Assessment core assessment plus one 1.5hr exam, assignments, projects

This module will deal with the reproductive biology, biogeography and evolution of flowering plants- Students willbe introduced to the latest methodologies and data sources employed ^identifying evolutionary units (both past and present) and reconstructing their phylogenetic relationships. The general application of systematics — for example in ecology and conservation— will be considered.

122 Protistology module

Dr Hinde, Assoc. Prof. Larkum, Prof. Patterson and others

Qualifying courses either Biology 2 (Animals), Biology 2 (Animals) (Advanced) or Biology 2 (Plant Anatomy and Physiology) Auxiliary or Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced) with Biology 2 (Plant Ecology and Diversity) Auxiliary or Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)

Classes Sem 1: (4 lec and 8 prac)wk, field courses. Timetable 2

Assessment core assessment plus one 1.5hr exam, assignments, projects

A broad-based coverage of systematic protistology (algae and protozoa) and selected facets of the ecology and general biology of these organisms.

123 Biology of Terrestrial Vertebrates module

Prof. Shine, Dr Dickman

Qualifying course Biology 2 (Animals) or Biology 2 (Animals) (Advanced)

Classes Sem 1: (4 lec and 8 prac)/wk, two 2-day field courses. Timetable 2

Assessment core assessment plus one 1.5hr exam, assignments, projects

An evolutionary perspective on the radiation of terrestrial vertebrates, with special emphasis on the biogeography, phylogeny, morphology and ecology of representative taxa in the Australian fauna. The course will include at least one field trip to familiarise students with vertebrates of the Sydney region, and the techniques used to observe, capture, handle, identify and study them.

124 Marine Biology module 6 units (MS)

Dr Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Assoc. Prof. Larkum

Qualifying courses either Biology 2 (Animals), Biology 2 (Animals) (Advanced) or Biology 2 (Plant Anatomy and Physiology) Auxiliary or Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced) with Biology 2 (Plant Ecology and Diversity) Auxiliary or Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)

Classes Sem 1: (4 lec and 8 prac) / wk, field courses. Timetable 2

Assessment core assessment plus one 1.5hr exam, assignments, projects

Marine biological diversity is discussed withparticular attention to the major types of marine habitats represented along the Australian coastline. Emphasis will be placed on exposing students to the key ideas, researchers and methodologies within selected fields of marine biology. Students will develop skills in areas such as the identification of marine algae and angipsperms, and the techniques used to study marine animals and plants. Discussion sessions will review major marine biological themes, laboratory sessions will develop hands-on experiences with marine organisms, and several field trips will be made to Jervis Bay and local marine sites.

125 Entomology 12 units

Staffing to be notified

Qualifying course Biology 2 (Animals) or Biology 2 (Animals) (Advanced)

Classes Sem 1: (4 lec & 8 prac)/wk. Timetable 2

Assessment one 3hr theory exam, 2 prac exams

This course will deal with the external and internal morphology of the major orders of insects. Lectures will also cover the basic characteristics of each order of insects, their general life cycle and important pests or beneficial species. The biogeography and evolution of the insects will be considered. Some basic aspects of taxonomic theory will also be dealt with. Practical classes will deal with the classification of the class Insecta and students will be expected to key out insects to family level in the' major orders only.

130 Molecular Genetics and Recombinant DNA Technology 12 units

Dr Lyon, Dr Raphael, Prof. Skurray, Prof. Willefts
Qualifying course Biology 2 (Molecular and General Generics) Auxiliary or Biology 2 (Molecular and General Generics) Auxiliary (Advanced)
Classes Sem 1: (4 lec & 8 prac)/wk, one 2-day excursion. Timetable 3
Assessment one 3hr exam, one 1.5hr practical exam, practical reports, seminars

A course of lectures, seminars, practicals and tutorials onmolecular genetics and its application to the genetic manipulation of both prokaryotic and eukaryotic organisms. Lectures will cover the molecular genetics of bacterial and animal viruses including HIV, prokaryotic and eukaryotic gene regulation and expression, whole genome analysis, plasmids, transposons and mobile DNA, yeast genetics, and the use of molecular techniques in systematics and ecology. The application of molecular genetics in biotechnology is covered in lectures on the cloning and expression of foreign genes in bacteria, yeast, animal and plant cells, novel human and animal therapeutics including human gene therapy, new diagnostic techniques for human and veterinary disease, the generic engineering of animals and plants, and the release of genetically modified organisms into the environment. Practical work includes the use of molecular techniques for DNA isolation, digestion, electrophoresis, cloning and PCR amplification, labelling of DNA probes and DNA hybridisation, DNAsequencingand computer analysis of gene sequences, and immuno-detection of proteins.

210 Cellular and Molecular Physiology 12 units

Assoc. Prof. Allaway, Assoc. Prof Armati, Dr Hoegh-Guldberg, Assoc. Prof. Larkum, Dr Marc, Dr Meats, Dr Morris, Dr Overall
Qualifying courses apply to modules
Classes Sem 2: (4 lec)/wk, (core 4 prac)/wk. Timetable 1

Core

The core occupies the lectures and laboratories for weeks 1-6 before students may elect one of the modules below. The core covers aspects of physiology at the cellular level common to most organisms. The nature of cell membranes, permeability, active transport and the importance of these processes in producing electrical gradients are discussed and examples provided, relating these to both plant and animal models. Theinteractions between cells are an important theme in the cell physiology core which provides important background on cell signalling and the concepts of immunity. Recentideas on the cytoskeleton and the control of the cell cycle will be discussed. The final week of core studies comprises an introduction to molecular techniques as used in contemporary physiology.

211 Animal Physiology module

Dr Hoegh-Guldberg, Dr Meats, Dr Morris
Qualifying course Biology 2 (Animals) or Biology 2 (Animals) (Advanced)
Classes (4 lec & 8 prac)/wk, one 4-day field trip. Timetable 1
Assessment one 3hr exam, assignments, practical, quiz

The course examines the basis of physiological responses by animals. Mechanisms in animal adaptation are covered at the level of cells, tissues, organs and whole organisms. They are related to the physiological ecology of the species. Both vertebrate and invertebrate examples are used. There is a large emphasis on the practical aspects of physiological experimentation and associated methodologies. The lecture series discusses a variety of homeostatic mechanisms, including maintenance of water and salt balance, acid-base state, regulation of respiration and blood function as well as muscle function and vision systems. Each topic is explored from the aspect of process and mechanism before relating these to the requirements of the animal. In this way the response to environmental changes, and the role of each system in the adaptation of animal to environment, can be outlined. The theory and practical exercises are complemented by a four-day field exercise in environmental physiology, adaptive biology and field monitoring.

212 Plant Cells and Molecules module

Assoc. Prof. Allaway, Dr Marc, Dr Overall,
Qualifying course 1995: any Biology 2 course. 1996: either Biology 2 (Plant Anatomy and Physiology) Auxiliary, or Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced) or Biology 2 (Cellular & Developmental) Auxiliary, or Biology 2 (Cellular & Developmental) Auxiliary (Advanced)
Classes (4 lec & 8 prac)/wk, 1 workshop. Timetable 1
Assessment one 3hr exam, assignments, practical

Current topics at the interface of plant molecular biology, plant cell biology and developmental physiology are explored. Subjects covered include the cytoskeleton, cell cycle control, recent ideas on gravitropism and phytochrome, hormones, signal transduction apical meristems and flowering. Advances in the molecular understanding of plant physiology and development are discussed. Practical work which uses a variety of plant material including protoplasts, suspension cultures and *Arabidopsis* seedlings includes a range of molecular techniques, immunocytochemistry, protein purification and characterisation. The workshop, held at research institutions in Canberra, will involve laboratory work and discussion groups.

220 Ecology 12 units (MS)

Dr Dickman, Dr Meats, Prof. Underwood and others
Qualifying courses apply to modules
Classes Sem 2: (4 lec & 8 prac)/wk, one 8-day field course in vacation before Sem 2. Timetable 2

The core covers topics on theory, quantification and experimentation in ecology and analysis of pa tterns of distribution, abundance, dynamics, demography and life-histories of natural populations. Multi-species interactions in animal communities are considered. An integra ted part of the core module is the application of ecological theory and methods to testing hypotheses and solving practical problems. The core is followed, after the first five weeks, by one of three modules: Marine Ecology, Terrestrial Ecology or Plant Ecology.

221 Marine Ecology module (MS)

Prof. Underwood, Dr Kingsford

Qualifying course Biology 2 (Animals) or Biology 2 (Animals) (Advanced)

Classes (4 lec & 8 prac)/wk. Timetable 2

Assessment one 3hr exam (includes core assessment), 1 project, field course

Marine Ecology provides practical experience with quantitative sampling and experimental analysis of populations. The emphasis is on the logical structure of ecological investigations and on the design and analysis of sampling and experimental studies. The course also explores the rela tionships between theories, practical evidence and the solution to problems of pollution, environmental disturbance, conservation and management of exploited resources.

222 Terrestrial Ecology module

Dr Dickman and others

Qualifying courses 1995: *either* Biology 2 (Animals), Biology 2 (Animals) (Advanced) *or* Biology 2 (Plant Ecology and Diversity) Auxiliary *or* Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced). 1996: Biology 2 (Animals) or Biology 2 (Plant Ecology and Diversity) Auxiliary with Biology 2 (Animals — Theory) Auxiliary

Classes (4 lec & 8 prac)/wk. Timetable 2

Assessment one 3hr exam (includes core assessment), project, field course

This course considers primary production and mineral nutritionin plants and the analysis of plant population dynamics. Inter- and infra-specific competition herbivory and predation. Behavioural strategies of insect and vertebrate herbivores and their predators. Relationships between ecology and methods for management of populations and communities with emphasis on conservation and managed exploitation of animal and plant resources and the control of pests (including biological control). Practicals will introduce analysis of soils and vegetation, growth and analysis of natural and experimental populations and the behaviour of food chains.

223 Plant Ecology module

Biological Sciences staff

Qualifying course Biology 2 (Plant Ecology and Diversity) Auxiliary or Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)

Classes (4 lec & 8 prac) / wk. Timetable 2

Assessment one 3hr exam (includes core assessment), major project, field course report

This course considers processes affecting the distribution and abundance of plants as primary producers. Attention will be paid to experimental analysis of modular ecologies and interactions with the physical environment. A particular focus will be the nature of plants as resources, their conservation and management.

230 Eukaryotic Genetics and Development 12 units

Assoc. Prof. Armati, Dr Donald, Assoc. Prof. Gillies, Dr Raphael and others

Qualifying course Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)

Classes Sem 2: (4 lec & 8 prac)/wk, one 2-day excursion. Timetable 3

Assessment one 3hr exam, one 1.5hr prac exam, prac reports, seminars

A course of lectures, seminars and practicals on molecular genetics and its application to the understanding of mammalian and human genetics, animal development and differentiation, and evolutionary biology. Lectures will cover molecular and ultrastructural arrangement of DNA sequences and genes in eukaryotic genomes and chromosomes, mammalian gene organisation and expression, biochemical and molecular genetics of human disease, linkage and mapping, genetics of early animal development, nerve cell differentiation and growth, MHC function and recognition of self, sequence evolution, population and evolutionary genetics. Practical work will provide experience with a range of molecular, cytological and genetical skills while illustrating theoretical principles.

Biology Honours

A single honours program in Biology accommodates students from Biology 3. Information about qualifications for entry into honours is available from the School Office (Building A12).

During the honours year the principles established in the first three years of the undergraduate course are further developed, and students are introduced to a wider field of biology and biological techniques. Students may elect to specialise in any of the aspects of biology that are studied in the school.

Students who have signified their intention of entering the honours course will be notified of acceptance shortly after the publication of the Third Year examination results. Honours students are expected to start their academic year at the beginning of February.

With the permission of the Head of School and the Faculty of Science, students who have qualified to take an honours course and passed Biology 1 or Biology 1 (Advanced) may take Biology honours without having taken Biology 2 and 3. The concession is intended for students who have majored in physics, chemistry or biochemistry and wish to study biophysics or plant physiology; they should first discuss their qualifications with Dr R. L. Overall.

The honours course comprises:

(a) a *project or two half-year projects* in which the student investigates a problem and presents oral and written accounts of his or her research.

(b) *coursework units* chosen from a program offered by the School.

(c) *a course in experimental design,* and other technical instruction.

The degree will be awarded on the basis of:

(a) written assignments and essays from coursework units.

(b) marks awarded for a thesis on the subject of the project.

Postgraduate study

MSc and PhD degrees by research are available in the School.

On completion of an honours degree (at first or second class level), MSc Preliminary course or

Graduate Diploma in Science (see below), students may pursue candidature for MSc degrees by research. The range of research fields offered and the fields of eachmember of academic staff are listed in the School's Postgraduate Studies Handbook, which is available from the School Office (Building A12).

Graduate Diploma in Science

The Graduate Diploma program inBiologyisavailable as a one-year full-time or two-year part-time course. Information about qualifications for entry into the Graduate Diploma is available from the School Office (Building A12).

The course is intended for students wishing to progress beyond a pass degree but not *via* the honours degree, or who are ineligible for admission to honours. Students enrolled in the one-year course will follow the same program as Biology honours students and be assessed using similar criteria. Students may therefore elect to specialise in any area within the research interests of the School. Projects jointly supervised by staff in other schools or departments within the University may also be considered. Students undertaking the two-year course (part-time) will follow the same curriculum but will satisfactorily complete the instructed elements of the course before progressing to the project element at the end of first year.

Students who have signified their intention to enter the Graduate Diploma course will be notified of acceptance shortly after the publication of the Third Year examinationresults. Graduate Diploma students are expected to start their academic year at the beginning of February.

The composition of the Graduate Diploma course is identical to that for the honours course (see Biology Honours).

Cell Pathology

Cell Pathology 3 — 24 units

Prof. Hunt, Dr Gibbins

Prereq Biochemistry 2 or Physiology 2 or Biology 2 (Molecular and General Generics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced) and Biology 2 (Generics, Cellular and Developmental) Auxiliary or Biology 2 (Genetics, Cellular and Developmental) Auxiliary (Advanced)

Classes Yr: (1 tut & 11 prac)/wk

Assessment one 3hr exam, 12 practical reports, 1 project report

This course is particularly suited to those interested in subsequently doing research in a challenging area of biology. It will provide students with insight into alterations in cellular processes in disease and injury and equip them to apply the concepts and methods of cell biology to the study of pa thology. Subjects studied include inflammation, immunopathology, cellular immunology, muscle pathophysiology and cancer metastasis.

Course structure

Tutorials and directed reading will cover the general principles of pathology, emphasising the physiological, biochemical and genetic aspects and correlation of disturbed cell function with structural and ultrastructural changes.

Laboratory work is designed to illustrate particular aspects of pathology. A range of methods that will help in later development of the subject will be used. These include flow cytometry, tissue culture, molecular biology and microscopy.

In second semester each student will undertake a project designed to try to answer a question (preferably of his or her own asking) that has evolved in the earlier study of the subject. Performance in this project will be part of the assessment of the suitability of a student to proceed to Honours.

Enrolment requirements

Prerequisites for the course are set out in Chapter 3. Students interested in the course should discuss it with Professor Hunt or Dr Gibbins. The Department can cater only for a small number of students in this course and superior performance in Junior and Intermediate courses will be essential to ensure success in Cell Pathology 3. The Department of Pathology is located on Level 5 of the Blackburn Building (tel. 3512414).

Civil Engineering Science

The School of Civil and Mining Engineering is part of the Faculty of Engineering. In addition to providing professional training in this branch of engineering, it provides an 8-unit course. Civil Engineering Science 2, in the Faculty of Science.

The course is available as an Intermediate course in a science degree for students majoring in Mathematics, Physics, Chemistry, Geology, Computer Science or Soil Science, and who are thinking of an applied science career in building or civil engineering or in related fields.

The course is intended first to demonstrate the application of scientific principles in an engineering context so that the science student will gain an understanding of the engineering behaviour of materials and engineering structures. The second intention is to introduce the application of this understanding to the analysis and design of engineering structures.

Double degree

Some Science graduates, who have passed the course Civil Engineering Science 2, may obtain a Bachelor of Engineering degree in Civil Engineering after an additional two years' study, following award of the BSc. Students wishing to undertake this option must apply through UAC and compete on the basis of academic merit.

Further details regarding admission to the BE in Civil Engineering may be obtained from the Engineering Faculty Office in the Engineering Faculty Building.

Location

The School is in the south-east of the Engineering precinct and can be entered from Shepherd Street.

However, most classes in this course are normally held in the theatres and tutorial rooms of the Link Building.

Noticeboards
Notices concerning this course and the component courses of which it is comprised will be displayed in the Junior Courses and Intermediate Courses noticeboards of the PNR Building, outside the lecture theatres on level 3, and in the Link Building (next to the Engineering Faculty Office).

Registration
All students are required to register with Mr N. L. Ings in Room 410 in the School of Civil and Mining Engineering on either the last day of Orientation or on the first day of lectures.

Timetable information on alternative lecture/ tutorial/laboratory/practical classes is available in the Engineering Student Enquiry Office in the Link Building.

Advice on courses
Members of staff are available during enrolment and orientation periods to give advice about these courses. If you wish to see an adviser please apply to the school office.

Tutorials and laboratories
All students are required to undertake the tutorial and laboratory work associated with these courses, details of which are set out in the timetables. The experimental and tutorial work is designed as an integral part of the course to complement the lecture material. It should be noted that the difficulties of timetabling are such that the majority of classes are in second semester.

Civil Engineering Science 2 16 units

Prerea Mathematics 1 or Mathematics 1 (Advanced), Physics 1 or Physics 1 (Advanced) and Chemistry 1 or Chemistry 1 (Advanced)

Materials

Classes Sem 2:3 lec/wk & four 3hr prac/sem
.Assessment one 3hr exam, coursework

Materials classification. Abundance of elements. A consideration of the production of metals. The mechanical properties of materials. Elastic moduli; stress and strain. Yield and tensile strength, hardness. Fracture and toughness. Fatigue failure. Creep deformationand fracture. Friction and wear. Polymers; giant molecules and their configurations. Ceramic materials. Materials in hostile environments.

Textbooks
Ashby and Jones *Engineering Materials - an Introduction to their Properties and Applications* (Pergamon, 1981)
van Vlack *Materials for Engineering — Concepts and Applications* (Addison-Wesley, 1982)

Statics

CZasses Sem 2: (1 lec & 2 tut)/wk
Assessment one 2hr exam

Basic concepts; scalars and vectors; units; the SI system. Statics of the rigid body: forces and moments; systems isolation; free body diagrams, and equilibrium criteria. Elementary principles of virtual work. Elementary kinematics and dynamics of the rigid body: angular and linear velocity; plane curvilinear motion of a particle; absolute and relative motion. Distributed force systems: beams with distributed loads; statically determinate, pinjointed structures.

Textbook
Meriam *Engineering Mechanics, Vol.1,Statics* (Wiley, 1980) SI version

Structures

Classes Sem 1: (3 lec & one 2hr rut)/wk
Assessment one 3hr exam, class

Statics, shear, moment and axial force diagrams. Elementary elasticity, stresses, strains, deformations, compatibility. Bending and shear stresses in beams. Deflection of beams. Analysis of triangulated frames. Torsion. Elementary instability.

Textbook
Megson *Strength of Materials for Civil Engineers* (Arnold, 1987)

Design

Classes Sem 2: (two 1hr lec & one 2hr prac)/wk
Assessment one 3hr exam, class

Philosophy of design. Loads. Design of simple elements of steel and concrete structures. Design project.

Textbooks
Buckle *Elements of Structure* 2nd edn (Pitman)
AS4100—*SAA Steel Structures*
AS3600—*Concrete Structures Code*
AS1170—*SAA Loading Code Parts l&U*
AS1511—*SAA High Strength Structural Bolting Code*

Chemical Engineering Science

The Department of Chemical Engineering is part of the Faculty of Engineering. In addition to providing professional training of this branch of engineering, it provides two courses in the Faculty of Science, namely Chemical Engineering Science 2 Auxiliary, a 4-unit course and Chemical Engineering Science 2, an 8-unit course.

These courses are available as Intermediate courses in a science degree for students majoring particularly in chemistry, but also in biochemistry, physics or mathematics, and who are thinking of a career in the chemical and process industries, or in applied industrial research.

The courses are intended to give a science student some insight into the principles which control the design and performance of large scale industrial processing plants.

Conversion course
The Department of Chemical Engineering also offers a two-year course by which the holder of a Bachelor of Science degree may obtain a degree in Chemical Engineering provided that courses equivalent to Chemistry 2, Mathematics 2 and Chemical Engineering Science 2 have been completed. Students wishing to undertake this option must apply through UAC and

compete on the basis of academic merit. Further details regarding admission to the BE degree course may be obtained from the Engineering Faculty Office in the Engineering Faculty Building.

Structure of courses
Chemical Engineering Science 2 Auxiliary provides an introduction to the nature and analysis of large-scale chemical operations.

■ Chemical Engineering Science 2 incorporates the auxiliary course and, in addition, considers the basic principles of heat, momentum and mass transfer in large-scale operations.

Location
The Department is in the Engineering precinc t, ad jacent to the pedestrian way near the Shepherd Street entrance. Lectures are normally held in the PNR theatres.

Noticeboards
All noticeboards are located in the foyer areas outside the lecture theatres on Levels 2 and 3. Notices relevant to these subjects will be displayed on the Level 3 noticeboard just inside the front entrance of the Department.

Registration
All students are required to register with the Secretary to the Head of the Department of Chemical Engineering in Room 402 on Level 4 in the Chemical Engineering Building on ei ther the last day of Orientation or on the first day of lectures.

Timetable information on alternative lecture/ tutorial/laboratory/practical classes is available in the Engineering Student Enquiry Office in the Link Building.

Advice on courses
Members of staff are available during enrolment periods and Orientation Week to give advice concerning these courses. If you wish to see a Departmental adviser please apply to the Department office.

Tutorials and laboratories
All students are required to undertake the tutorial and laboratory work associated with these courses, details of which are set outin the timetables. The experimental and tutorial work is designed as an integral part of the course to complement the lecture material.

Chemical Engineering Science 2 Auxiliary 8 units

Prereq Chemistry 1 or Chemistry 1 (Advanced) and Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (2 lec & one 2hr tut)/wk
Assessment Sem 1: one 3hr exam; Sem 2: one 3hr exam, project assessment

Introduction to large-scale chemical processing; discussion of typical flowsheets for the manufacture of basic chemicals. The application of physicochemical principles to material and energy balance calculations.

A major assignment involving the computation of material and energy balances for a complete flowsheet, and a project on some aspect of the chemical industry.

Textbook
Felder and Rousseau *Elementary Principles of Chemical Processes* (Wiley, 1986)

Reference book
Perry and Chilton (eds) *Chemical Engineers Handbook* (McGraw-Hill, 1984)

Chemical Engineering Science 2 16 units

Prereq Chemistry 1 or Chemistry 1 (Advanced) and Physics 1 or Physics 1 (Advanced) or Mathematics 1 or Mathematics 1 (Advanced)
Coreq Chemistry 2
Classes Sem 1: (4 lec & one 1hr tut & one 2hr tut)/wk; Sem 2: (4 lec & one 1hr tut & one 2hr tut & one 3hr prac)/wk
Assessment Sem 1: one 3hr exam; Sem 2: one 3hr exam; Yr: project and lab assessment

As for Chemical Engineering Science Auxiliary with in addition the following:

An integrated introductory treatment of the transport of momentum, heat and mass.

Fluid statics: application to pressure measurement and forces on storage vessels. Inviscid flow theory: application to flow measurement and enlargement losses. Laminar flow of Newtonian fluids in pipes: derivation of velocity profile, flow rate and frictional loss. Turbulent flow in pipes: application of dimensional analysis, friction factors; energy balances for pipe flow systems. Pumps: theory of reciprocating and centrifugal pumps; cavitation and NPSH.

Heat conduction: rectilinear and cylindrical geometry. Convection: concept and use of the heat transfer coefficient. Dimensional analysis and dimensionless correlations for heat transfer in pipe flow. Natural convection. Simple heat exchangers.

Diffusion models and examples. Convection and dilute diffusion. Diffusion coefficients in gases, liquids and polymers. Mass transfer coefficients, interfacial conditions. Dimensional analysis, correlations. Heat and mass transfer analogies. Absorption of dilute and concentrated vapours. Heat and mass transfer, wet-bulb temperature.

Textbooks
As for Chemical Engineering Science Auxiliary and:
Ozisik *Heat Transfer-a Basic Approach* (McGraw-Hill, 1985)
Cussler *Diffusion-Mass Transfer in Fluid Systems* (C.U.P., 1985)
Others as advised during classes

School of Chemistry

Fully-detailed information about all courses, prescribed textbooks and reference books is available from the Chemistry School.

Exercises are issued and tutorials are held a t regular intervals for all courses.

Chemistry 1 12 units

Classes Yr: (3 lec & 3 prac)/wk

The course Chemistry 1 is offered at two levels: **Chemistry 1 (Advanced)** is available to students with a very good school record in science or chemistry. Chemistry 1 provides a sound foundation for a further

study of chemistry, or any chemically-based course in subsequent years of study in the faculty. This chemistry course is built on a satisfactory prior knowledge of the Chemistry component of the Science 4-unit or 3-unit HSC course or 2-unit Chemistry. Revision of basic concepts of the school course is given in first semester.

Both Chemistry 1 (Advanced) and Chemistry 1 cover chemical theory, inorganic, physical and organic chemistry. The practical work and the theory syllabuses for the two courses are similar. The level of treatment in the Chemistry 1 (Advanced) course is more advanced and presupposes a very good grounding in the subject at secondary level. Either Chemistry 1 TSP,. Chemistry 1 (Advanced), or Chemistry 1 is an acceptable prerequisite for entry into Intermediate Chemistry courses.

Course lectures
A course of about 3 lectures.

Practical work
A course.of 28 three-hour sessions, one per week throughout the year.

Textbooks
Chemistry 1 (Advanced) and Chemistry 1
Students should obtain a book list from the School during the orientation period.

Examinations
Theory examinations for both courses are held at the end of each semester. Students are advised at the beginning of the year about other factors contributing to assessment for the course.

Chemistry Intermediate courses

1. The following courses will be offered:
   Chemistry 2 16 units
   Chemistry 2 Long 20 units
   Chemistry Auxiliary 8 units
2. A fully-detailed booklet on the courses and textbooks is available from the Chemistry School. All students who intend to take Intermediate Chemistry must register with the School of Chemistry in addition to completing normal university enrolment procedures. This registration takes place in the first practical session of first semester.

Chemistry 2 16 units

Qualifying course Chemistry 1 or Chemistry l(Advanced)
Prereq Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)

Lectures
A course of 27 lectures in inorganic chemistry, and 35 lectures in both organic chemistry and physical/ theoretical chemistry given at the rate of three-four lectures per week throughout the year.

Practical work
A course of five hours per week for 22 weeks, consisting of seven weeks in each of inorganic and organic chemistry and 8 weeks in physical chemistry. Students must ensure that two afternoons per week, *free from other practical work commitments,* are available for practical work. Lists assigning students to practical classes are available on the first day of first semester and practical laboratories also normally commence on this day.

Chemistry 2 Long 20 units

Qualifying course Chemistry 1 or Chemistry 1 (Advanced)
Prereq Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)

Lectures
A course of 28 lectures in inorganic chemistry, 45 lectures in organic chemistry, and 35 lectures in physical/theoretical chemistry, given at the rate of four lectures per week throughout the year.

Practical work
A course of six hours per week for 26 weeks, consisting of eight weeks in inorganic chemistry and nine weeks in each of the inorganic, organic and physical/ theoretical chemistry laboratories. Students must ensure that two afternoons per week, *free from other practical work commitments,* are available for practical work. Lists assigning students to practical classes are available on the first day of firstsemester and practical laboratories also normally commence on this day.

Chemistry 2 Auxiliary 8 units

Qualifying course Chemistry 1 or Chemistry 1 (Advanced)
Prereq Mathematics 1, Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)

Lectures and tutorials
A course of 70 lectures (35 lectures in organic chemistry and physical/theoretical chemistry) given at the rate of two-three contact hours per week in first semester and two contact hours per week in second semester.

Practical work
A course of three hours per week for eleven weeks (five weeks in the Physical Chemistry Laboratory during weeks 1-5 inclusive of first semester, and six weeks in the Organic Chemistry Laboratory during weeks 5-10 inclusive in second semester). Students must ensure that one afternoon a week, *free from other practical work commitments,* is available for practical work during the above times. Lists assigning students to practical classes are available on the first day of first semester and practical laboratories also normally commence on this day.

Textbooks
Inorganic (all courses):
F.A. Cotton, G. Wilkinson and P.L. Gaus *Basic Inorganic Chemistry* (John Wiley & Sons, 1987)
J.S. Fritz and G.H. Schenk *Quantitative Analytical Chemistry* (Allyn & Bacon, 1987)

Organic (all courses):
J. McMurry *Organic Chemistry* (Brooks/Cole, 1992)

Physical (Long and Normal courses):
Either
P.W. Atkins *Physical Chemistry* (Oxford U.P., 1990)
(Recommended for students intending to proceed to Senior Chemistry)
or
W.J. Moore *Basic Physical Chemistry* (Prentice-Hall, 1983)

Reference books
P.W. Atkins *Quanta, a Handbook of Concepts* (Oxford U.P., 1974)

G.M. Barrow *Introduction to Molecular Spectroscopy* (McGraw-Hill, 1962)
L.K. Nash *Elements of Statistical Thermodynamics* (Addison-Wesley, 1965)
F.W. Pillar *Elementary' Quantum Chemistry* (McGraw-Hill, 1990)
K. Yates *Huckel Molecular Orbital Theory* (Academic Press, 1978)

Chemistry Senior courses

The following courses are offered:

Chemistry 3	24 units
Chemistry 3 Additional	24 units

Advice on courses

A fully-detailed information booklet on the courses and textbooks is available from the Chemistry School. All students who intend to take a Chemistry Senior course, in addition to consulting one of the Chemistry School advisers on duty in Carslaw Lecture Room 3A during the enrolment period, must register in the Chemistry School during either the Wednesday or Thursday of the orientation period. Registration includes selection of third year modules from the lists below, completion of a registration card and the taking of an ID photograph.

Chemistry 3 24 units

Qualifying course Chemistry 2 or Chemistry 2 Long
Classes Yr: (4 lec & 8 prac)/wk
Assessment 45 min exam per module and lab assessment

A course of four lectures per week throughout the year. The lectures will be presented in modules (each module runs for a half-semester and comprises seven lectures). A full listing of the module titles is given below. Each student must take seventeen modules, of which one must be in each of the inorganic, organic and physical/theoretical chemistry areas. Four modules (the first four listed under the *Common* heading in the list below) are compulsory for all Chemistry 3 students. Theremainmgthirteenmodules are to be chosen from the list below, except that students may not take more than nine modules from the same subject area.

Common Modules
Spectrometric Identification of Organic Compounds
Symmetry
Kinetics
Chemistry Laboratory Practices
Chemical Bonding

Inorganic Chemistry Modules
Vibrational Spectroscopy of Inorganic Compounds
Diffraction Methods in Inorganic Chemistry
Instrumental Methods in Analytical Chemistry
Structural Methods in Inorganic Chemistry
Electrochemical Methods in Inorganic Chemistry
Electronic Spectroscopy
Surface Analysis
Main Group Chemistry and Materials
Transition Metal Chemistry
Inorganic Reaction Mechanisms
Organometallic Chemistry
Catalysis
Biological and Medical Inorganic Chemistry 1: Metals in Biomolecules
Biological and Medical Inorganic Chemistry *2:* Chemotherapy and Toxicology
Mineral Chemistry
Aquatic Chemistry
Marine Chemistry

Organic Chemistry Modules
Stereochemistry in Organic Chemistry
Natural Products
Aromaticity
Organic Reaction Mechanisms
Free Radical Chemistry
Bioorganic Chemistry 1: Amino Acids and Polypeptides
Heterocyclic Chemistry 1
NMR Spectroscopy in Organic Chemistry
Radicals and Photochemistry in Organic Synthesis
Pericyclic Reactions
Modern Methods of Organic Synthesis
Heterocyclic Chemistry 2
Advanced NMR Spectroscopy
Organometallic Reagents in Organic Synthesis
Bioorganic Chemistry 2: The Chemistry of DNA and Carbohydrates
Supramolecular Chemistry

Physical/Theoretical Chemistry
*Quantum Chemistry — Fundamentals
Molecular Visualisation & Simulation
Surface Chemistry
*Statistical Mechanics
Applications of Symmetry
*Molecular Electronic Structure Theory
Intermolecular Forces
Colloid Chemistry
*Theory of Liquids and Solutions
Theory of Rate Coefficients of Gas-Phase Reactions
Time Dependent Quantum Mechanics
Molecular Spectroscopy 1: Electronic
Molecular Spectroscopy 2: Vibration and Rotation
High Temperature Chemistry
Polymer Chemistry 1: Chemistry of Polymer Formation
Polymer Chemistry 2: Physiochemical Properties of Polymers
*Spin In Chemistry
Solution Kinetics
Radiation Chemistry
Atmospheric Photochemistry

Practical work

Two options are available for students taking Chemistry 3 (and also for students taking Chemistry 3 Additional as a 24-unit course — *having completed Chemistry 3 in a previous year):*

Option 1: a total of 216 hours comprising 72 hours of practical work (eight hours per week for nine weeks) in each of the inorganic, organic and physical chemistry laboratories; or

Option 2: a total of 216 hours comprising 54 hours of practical work in each of the inorganic, organic and physical chemistry laboratories and 54 hours in the theoretical chemistry workshop. Option 2 may be

taken by students who select at least two of the physical/ theoretical chemistry modules marked with an asterisk in the list above.

Chemistry 3 Additional 24 units

Qualifying course Chemistry 2 or Chemistry 2 Long
Coreq or *prereq* Chemistry 3
Classes Yr: (4 lec & 8 prac)/wk
Assessment 45min exam per module and lab assessment

Students taking this course must be concurrently enrolled in or have previously completed Chemistry 3. The modules will be chosen from the list of modules above and the same selection rules as applicable to Chemistry 3 (see above) will apply to the selection of the additional 16 modules, except that those students who have not previously done so must undertake the Common module Chemical Bonding.

Practical work
Two different circumstances apply to students taking Chemistry 3 Additional.

For students taking Chemistry 3 Additional *not concurrently with* Chemistry 3 and who have not previously undertaken the theoretical chemistry workshop, the same practical course options are available as to students taking *only* Chemistry 3.

For students taking 48 units of Senior Chemistry (i.e. Chemistry 3 *and* Chemistry 3 Additional) the following two options are available:
Option 1:144 hours of practical work (sixteen hours per week for nine weeks) in each of the inorganic, organic and physical chemistry laboratories, *or*
Option 2:114 hours of practical work in each of the inorganic, organic and physical chemistry laboratories and 90 hours in the theoretical chemistry workshop. Option 2 may be taken by students who select at least two of the physical/theoretical chemistry modules marked with an asterisk in the list above.

Textbooks
Inorganic Chemistry:
E.A.V. Ebsworth, D.W.H. Rankin and S. Craddock *Structural Methods in Inorganic Chemistry* (Blackwell, 1991)

Organic Chemistry:
R.M. Silverstein *et al. Spectrometric Identification of Organic Compounds (Wiley, 1991)*
S. Sternhell and J.R. Kalman *Structures from Spectra* (Wiley, 1986)
J. McMurry *Organic Chemistry* (Brooks/Cole, 1992)

Physical/Theoretical Chemistry:
P.W. Atkins *Physical Chemistry* (Oxford, 1990)

Reference books
Inorganic Chemistry:
F A. Cotton and G. Wilkinson *Advanced Inorganic Chemistry* (Wiley 1994)
N.N. Greenwood and A. Eamshaw *Chemistry of the Elements* (Pergamon, 1984)
A. Vincent *Molecular Symmetry and Group Theory* (Wiley 1977)

Organic Chemistry:
I.A. Joule and G.F. Smith *Heterocyclic Chemistry* (Van Nostrand, 1972)
J. *MarchAdvanced Organic Chemistry—Reactions,Meclianisms and Structure* (McGraw-Hill, 1985)

Chemistry Honours

Students of sufficientmeritmay be admitted to honours courses and may then graduate withhonours in one of the following subject areas:

' Inorganic Chemistry
Organic Chemistry
Physical Chemistry
Theoretical Chemistry

They are required to:

(a) carry out research work under the direction of a supervisor;
(b) submit a report in the form of a thesis on this work;
(c) attend such lectures, colloquia, etc., as directed; and
(d) answer, satisfactorily, written examinations.

Further details are available from the Head of the School of Chemistry who will direct enquiries to the Professors and other senior members of staff (in the above subject areas) from whom information about higher degree requirements (see below) can also be obtained.

Postgraduate study

MSc and PhD degrees by research are available in the School.

On completion of an honours degree (at first class or second class division 1 level), MSc Preliminary course or Graduate Diploma in Science, students may pursue candidature for MSc or PhD degrees by research. The range of research fields offered and the fields of research for each member of academic staff are listed in the School's Postgraduate Studies Handbook, which is available from the School Office (Level 2, Chemistry Building, F11).

Basser Department of Computer Science

Computer Science is the scientific discipline which has grown out of the use of digital computers to manage and transform information. Computer Science is concerned with the design of computers, their applications in science, government and business, and the formal and theoretical properties which can be shown to characterise these applications.

The diversity of the discipline is demonstrated by current research interests in the Department which include the design of computer hardware and networks, formal specification and complexity, programming languages and software engineering, graphics, and intelligent systems. The Department has a range of computers and specialised laboratories for its teaching and research.

Students who intend to major in Computer Science should pay particular attention to mathematical prerequisites for the courses. They must enrol in Mathematics 1 or Mathematics 1 (Advanced) concurrently with Computer Science 1 or Computer Science 1 (Advanced) and should take a second-year Mathematics subject concurrently with Computer

Science 2, as a second-year Mathematics course is a prerequisite for Computer Science 3. Students who complete Computer Science 3 are eligible to become Associate Members of the Australian Computer Society.

Intending honours students are strongly urged to complete a Senior Mathematics course (preferably Pure Mathematics 3) prior to entry into the honours year.

The courses offered by the Department are described briefly below, and more fully in the Department's Handbook which is available from the Department Office (Room G71) in the Madsen Building. Students should confirm details of courses, registration procedures, textbooks, etc., on the Departmental noticeboards. Those in doubt should seek advice from members of the Department's academic staff.

Computer Science 1 — 12 units

AKn HSC 3-unit Mathematics
Coreq Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)
Classes Yr: (3 lec & 2hr prac & 1hr tut)/wk
Assessment (assignments, one 3hr exam & one prac exam)/ sem

An introductory course in algorithms, programming, computing machines and systems, and computer usage. It is intended primarily as the first course of the Department's professional stream.

Students who wish to undertake the professional stream of courses in Computer Science will need to complete a parallel stream of courses in Mathematics (or Econometrics) to satisfy the prerequisites for subsequent Computer Science courses.

The three hours of lectures per week will be given in parallel streams.

For further details consult the Departmental Handbook.

Computer Science 1 (Advanced) — 12 units

AKn HSC 3-unit Mathematics
Coreq Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (LS)
Classes consult Department
Assessment assignments, examinations

Computer Science 1 (Advanced) is a special program for students with superior abilities or background. It involves substituting alternative, challenging/work for some of the required work in Computer Science 1. For example, students may do independent reading and meet with a staff member in small groups in place of attending lectures; as another example, students may do alternative assignments that are more open-ended than those in the usual course. To ensure consistent results, at least 50 per cent of the assessment willbebasedoncommontaskswithComputer Science 1. Students interested in Computer Science 1 (Advanced) mustenrplinComputer Science 1. During the year, selected students will be invited to take part in challenge work. If students undertake sufficient challenge work at a high standard, their enrolment will be changed to Computer Science 1 (Advanced).

Computer Science 2 — 16 units

Qualifying course Computer Science 1 or Computer Science 1 (Advanced)
Prereq Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (4 lec & 4hr prac/tut)/wk
Assessment (assignments, two 3hr exams & one prac exam) / sem

The topics covered include design and data structures, computer systems, logic and languages,programming practice with Unix, and two large programming projects.

For further details consult the Departmental Handbook.

Computer Science 3 — 24 units

Qualifying course Computer Science 2
Prereq Pure Mathematics 2 or Pure Mathematics2 (Advanced) *or* Applied Mathematics 2 *or* Applied Mathematics 2 (Advanced) *or* Mathematical Statistics 2 *or* Mathematical Statistics 2 (Advanced) *or* Mathematics 2 (Long) *or* Electrical Engineering Mathematics 2 (under section 13 of the Senate resolutions) *or* Econometrics 2
Classes Yr: (6 lec & 6hr prac/tut)/wk
Assessment (assignments, five 2hr exams & one major project)/yr

Computer Science 3 is organised into modules and arranged into several overlapping *streams*. Each stream consists of a sequence of modules that develops an important area of Computer Science. Students are required to complete one stream, involving both mandatory core modules and a limited range of optional modules. Streams to be offered are programming languages, intelligent systems, information systems and software engineering, computer systems design.

For further details consult the Departmental Handbook.

Computer Science 3 Additional — 24 units

Qualifying course Computer Science 2
Coreq Computer Science 3
Classes Yr: (6 lec & 6hr prac/tut)/wk
Assessment (assignments, five 2hr exams & one major project)/yr

Entry into Computer Science 3 Additional is subject to permission of the Head of Department. Interested students should consult the Director of Computer Science 3.

Computer Science 3 Additional allows students to obtain a broader and deeper understanding of Computer Science (including at least two streams) than is possible within the limits of Computer Science 3. Third year modules not already taken within Computer Science 3 form the basis of the course but, with the permission of the heads of Departments concerned, students may take up to three modules from other Senior courses (such as Pure Mathematics 3), possibly including one module from Computer Science Honours.

Computer Science Honours

Qualifying course Computer Science 3 at credit level or better and preferably a third year Mathematics course
Assessment exam, class, prac, project thesis

Computer Science Honours comprises coursework and a project. The project involves a substantial development task, generally in support of Departmental research activities. It provides a foretaste of, and a means of assessing a student's potential for, postgraduate research work.

Coursework currently offered covers: advanced operating systems, amortised complexity, computer networks, distributed algorithms, discrete event simulation systems, expert systems, graph algorithms and related topics; history of computing; linear geometry and signal processing; performance evaluation of computer systems; robotics; queuing systems; semantics; symbolic and algebraic computation.

Students are required.to participate in Departmental seminars as part of their coursework, and are encouraged to participate along with staff and research students in all activities of the Department. They are provided with office accommodation and laboratory facilities, and may be employed for a few hours per week in undergraduate teaching.

For further details consult the Departmental Handbook and the Computer Science Honours Guide Book.

Postgraduate study

Details about fields of postgraduate study within the Department may be obtained from the Department. The Department publishes an annual Research Handbook.

Department of Geography

Geography is a varied and versatile subject covering a broad spectrum of knowledge. It was once concerned principally with the description of the earth, but modern geography now embraces humanity's relationship with the earth within a scientific and highly-structured framework. Currently there are three main elements of Geography actively pursued by the Department. Aspects of *Physical geography* deal with such phenomena as landforms, plants and soil as elements of physical landscapes. *Human geography* consists mainly of social and economic geography. Social geography is concerned with such features as rural and urban settlements, cultural influences and way of life. Economic geography includes the study of agriculture, industry, transport, marketing and resources. *Environmental geography* is concerned with the human/land relationships. This was a traditional theme used as early as in Griffith Taylor's time in the 1920s. It has come to the forefront with contemporary concerns for the environment. However, these three divisions are arbitrary, and some courses involve integration of various aspects of them all.

As theoretical understanding and quantitative precision have advanced, geography has developed as a useful discipline for analysing and proposing solutions to practical problems. Geographers have proved their value in such fields as local government, town and regional planning, decentralisation and environmental management.

Location
The Department enquiry office is on the third level of the Institute Building (Room N421) on the eastern side of City Road.

Noticeboards
First year noticeboards are on the second level of the Dixon wing in the Institute Building outside Room N332. Second and third year noticeboards are between the respective teaching laboratories on the second and third levels in the Institute Building. A general noticeboard is in the corridor of the Institute Building on the ground floor. Students should consult their respective noticeboards regularly for details of excursions, course outlines and so on.

Registration
In addition to complying with enrolment procedures required by the University, all students must register with the Department in the Geography Conference Room, Institute Building, during the orientation period.

Advice on courses
Students may consult with members of staff, especially year supervisors, at any time concerning their courses. During the latter part of the summer vacation, inquiries as to staff availability should be made at the enquiry office.

tutorials and practical work
First year students must attend one two-hour practical session each week (see timetable). All students in second and third years are required to attend tutorials and /or designated practical sessions each week.

Assigned work and examinations
In first, second and third years, semester assignments and examinations will contribute very significantly to final marks for the year.

Conducted field excursions
In first year, students are required to attend two one-day excursions to localities within about 150km of Sydney. In each of second and third years, students are required to take part in long excursions, of about a week's duration, based on a centre remote from Sydney. It is expected that basic costs per student this year will be around $450. However, in physical and environmental geography, there may be the chance of substituting for this remote excursion by having a number of days each semester in the field (up to five days each semester). Those who wish to apply for an interest-free loan to enable them to meet the costs of excursions should consult the SRC and the financial assistance section of the central administration.

Excursion work will be assessed by written assignment and/or examination. Exemptionfromexcursions will only be granted under exceptional circumstances. Requests for exemption must be submitted *in writing* to the Head of Department.

Departmental handbook
Further details of Departmental activities, courses, excursions, and other relevant material are contained in the *Geography Handbook* available from the enquiry office in the Institute Building.

Note: Some courses may be rescheduled to allow for expected staff changes.

Geography 1 — 12 units

Dr Short, Assoc. Prof. Connell, Assoc. Prof. Warner
Classes Yr: (3 lec & 2hr prac)/wk
Assessment (one 3hr exam, 1500w report or another 3hr prac exam)/sem

Morning or afternoon course

The course extends over two semesters with three lectures and two hours of laboratory work weekly. Morning lectures are repeated in the afternoon. All students do the same course.

First semester: A systematic approach to the understanding of physical environmental processes

A systematic approach to modern physical geography with emphasis on processes in geomorphology and interactions of climate with weathering, soils and vegetation.

Second semester: Introduction to Human Geography

An introduction to the principles of human geography illustrated by an analysis of development problems in the south-west Pacific and a study of the location and distribution of economic activities ineluding resource use.

Geography 2 — 16 units

The course extends over two semesters with three lectures and the equivalent of five hours' assignment work (which may comprise tutorials and/or individual course work including fieldwork) weekly. The following courses are offered:

Principles of Geomorphology
Environment and Resources
Human Geography

In addition there is an integrated field methods course which will examine skills associated with the acquisition, manipulation and presentation of data used in geographical analysis of a region. The region will be studied in the field during a compulsory one week excursion. Skills developed within courses studied in the first semester will be applied to the collection and analysis of data obtained during the excursion.

Special Geography Sequence (Science students)

A student who has not taken the course Geography 1, but is a candidate for the degree of Bachelor of Science and has completed a Junior Mathematics course and one of Chemistry 1 or Physics 1 or Physics 1 (Advanced), may apply through the Faculty to enrol in the Intermediate Geography course, Geography 2.

The Department is not prepared to support applications from persons other than those who in their firstyear of studies havecompleted four Junior courses above the terminating pass grade and have not subsequently failed in any Intermediate courses, except in cases where special merit has been displayed in one or more subjects.

Principles of Geomorphology

Dr Short, Dr Thorns, Dr Cowell
Classes Yr: (3 lec & 1 tut)/wk
Assessment (one 3hr exam, two 1000w essays, tut papers, 5 days fieldwork)/sem

A two-semester course designed to introduce students to the principles of geomorphology. It involves an examination of the major earth surface landforms and the theories which have been developed to explain landform genesis. Earth surface processes are examined; there is an emphasis on systems theory to provide an understanding of the processes over a wide range of spatial and temporal scales.

First semester: Global and Regional Landforms

An examination of the major earth surface landforms and the theories which have been developed to explain landform genesis.

Second semester: Fluvial and Coastal Geomorphology

This course provides:
(1) an introduction to hydrogeomorphology and is concerned with processes and morphologies associated with rivers; and
(2) an introduction to the principles of coastal geomorphology assessing the role of endogenic (lithosphere) and exogenic (atmosphere and ocean) forces in shaping coasts.

Environmental Geography and Resource Management

Dr Dragovich, Dr Chapman, Dr Davey
Classes Yr: (3 lec & 1 tut)/wk
Assessment (one 3hr exam, two 2000w essays, tut papers, 5 days fieldwork)/sem

A two-semester course designed to evaluate the interaction of the physical environment and human use of the earth's surface. The first part of the course examines the role of the physical environment in influencing human activities. The second studies resources from social, political and economic perspectives.

Particular attention is given to two aspects of physical systems: soil erosion and natural hazards. Resource management problems are investigated at a range of scales with some emphasis being given to the changing relationship between people and environment in tropical areas.

Principles of Human Geography

Dr Gough, Dr Greenberg
Classes Yr: (3 lec & 1 tut)/wk
Assessment (one 3hr exam, two 2000w essays, tut papers)/sem

The course introduces concepts concerned with explaining the peopling of the earth by examining processes at various scales and the dynamics of systems over time.

Levels of human activity, from the global through to the urban, are considered through an examination of basic economic and social processes.

Geography 3 — 24 units

This course extends over two semesters with three lectures and the equivalent of nine hours'assignment work (which may be comprised of tutorials and/or individual coursework including fieldwork) weekly.

All students are required to attend a five-day field excursion. The traditional excursion may be replaced with fieldwork (up five days in each semester) conducted locally in association with courses being offered in 3P and 3M.

, Three 12-unit courses are offered: Geography 3P (Physical), Geography 3M (Environmental) and Geography 3E (Human). Students may elect to do one or two of these three courses. It would be assumed that those doing Geography 3P would have undertaken Principles of Geomorphology in second year; those doing Geography 3M would have undertaken Environment and Resources in second year; and those doing Geography 3E would have undertaken the Human Geography course in second year.

To complete Geography 3 a student must select four options, two per semester. Each option is equivalent to 3 units. A student's choice of options within the 3P, 3M or 3E courses is to be from themes or sequences which are related to the systematic development of research skills in the Department. These sequences are only a guide for the selection of courses. Any variation of these sequences must have the approval of the Head of Department. Students should consult with the course coordinator before selecting options. Not all options are offered in any given year.

Geography 3P: Advanced Geomorphology

The course examines the evolution of the landscape involving the history of landforms and vegetation in association with tectonic forces, climatic change and biological factors. Physical, chemical and biological weathering processes are studied and there is an emphasis on pedogeomorphology.

Coastal Systems
The course deals with the relationships between coastal morphologies and the processes responsible for them. The focus is on the general principles of morpho-dynamic adjustment/particularly as applied to the coastal boundary layer operating on the inner shelf, shoreface and in estuaries. Form and process relationships that generate the world's major coastal depositional environments are studied.

Fluvial Systems
The focus is on short-term development and changes in fluvial systems; channel stability and instability, adjustments or channel metamorphosis, and the role of fluvial thresholds are considered.

Geography 3M: Advanced Environmental Geography

The course focuses on: coastal zone environmental management and environmental geomorphology. Critical physical systems and natural hazards in the coastal zone are examined and the ways in which decisions are made about resource management are studied. The practical uses of geomorphological concepts to solve problems are discussed.

Environmental Geomorphology and Information Systems
Geomorphological concepts are applied to solve problems where landforms are transferred and where there is some use of or change to superficial processes. The techniques of geographic information systems analysis are illustrated and applied.

Geography 3E: Advanced Social and Economic Geography

The course examines the contemporary economic geography of therichercapitalistcountries.lt examines the social and economic dynamics of industrial change in a regional context.

Dynamics of the Asia-Pacific Region
The general structure and growth patterns of the region are considered. Special topics include agricultural processes, population, migration and urbanisation.

Urban and Regional Geographic Systems
Development theories and their relationship to rural development and natural resources development, the role of aid and the structure and role of international capital flows are examined. Social structures and their relationship to resolving conflicts over development aims and environmental management are studied.

Geography Senior Course Combinations 48 units

Students may elect to do two Senior courses (24 units each) in the one year, giving a total of 48 units. Such students will be required to enrol in two of Geography 3P, Geography 3M or Geography 3E. Those who have passed at least one of the courses in Geography 3 at honours level may proceed to ah appropriate course in Geography honours. Those choosingphysical topics must have majored in Geography 3P; they may elect to do either Geography or Geomorphology honours.

Geography Honours

Students contemplating Geography honours are required to consult the Head of Department as soon as possible after the publication of third year results concerning choice of topic and the appointment of a staff supervisor. Preliminary work should begin shortly after the publication of these results.

Honours students are required to undertake formal coursework during first semester and to participate in seminars throughout the year as arranged. They will be required to study original problems, working as appropriate in the field, the laboratory, libraries, and in some instances in conjunction with other university or government Departments. A dissertation of not more than 20 000 words must be submitted during second semester, followed by an examination that may include both written and oral work.

Geomorphology Honours

Students who enter fourth year through Geography 3P, and who choose to work on landform studies, may elect to proceed to an honours degree in Geomor-phology in lieu of Geography. General course requirements are identical with those listed for Geography honours.

Department of Geology and Geophysics

The Department offers courses in geology and geophysics that provide the necessary qualifications for professional employment in these fields of earth science. Courses are also offered for students seeking a geoscience component in a broadly based science degree. Postgraduate research is conducted in many fields of earth science.

Location
The Department is housed in the Edgeworth David Building, immediately south of the Fisher Library on Eastern Avenue. First year lectures and laboratories are held in the Carslaw Building.

Noticeboards
Information for first year students is posted on noticeboards both inside and outside Carslaw Laboratory 1. Noticeboards for students in Intermediate and later years are in the foyer and corridors of the Edgeworth David Building. Students should consult the noticeboards regularly.

Registration
All first year students are required to register with the Department during the orientation period, on a day and at a place specified in the orientation program. Students in Intermediate and Senior years register with the Department before the first week of lectures.

Structure of courses
Geology 1 is a general course that provides an introduction to the earth sciences. Entry into Geology 1 requires no prior knowledge of the subject. The Intermediate and Senior Geology courses build on the preceding coursework to present a balanced and wide ranging coverage of the subject. A degree of specialisationisbuiltinto the Senior Additional course which is designed especially for students majoring in geology and proposing to pursue a career in that field.

Geophysics, a component of geology courses at all levels, is offered as a comprehensive Senior course.

Honours courses in geology and geophysics are offered to suitably qualified students.

Textbooks
For details of prescribed textbooks, students should consult the pamphlets relating to various Departmental courses available from the enquiry office in the Edgeworth David Building.

Examinations
These are held in June and November.

Geology 1 — 12 units

Dr Keene (coordinator)
Classes Yr: (3 lec & 1 prac/tut)/wk
Assessment Sem 1: one 3hr exam; Sem 2: two 3hr exams, class and fieldwork

A course of three lectures per week presenting a balanced coverage of the sciences focused on planet Earth. It serves both those students wishing to broaden their understanding of such contemporary problems as the conservation and utilisation of earth resources and those aiming to undertake later courses leading to professional training in the earth sciences. No prior knowledge of geology is assumed of students entering Geology 1.

A weekly three-hour laboratory and tutorial session is given to study of materials and concepts introduced in the lectures: minerals, rocks, fossils, maps, earth structures, etc.

Several field excursions during the year are an integral part of the course.

Students considering enrolling in Geology 1 should study the pamphlet *Geology 1*—2995, obtainable from the enquiry office in the Edgeworth David Building; it gives details of course content, text and reference books, staffing and other relevant matters.

Geology 2 — 16 units

Dr Middlemost (coordinator)
Qualifying course Geology 1
Classes Yr: (4 lec & 2 prac)/wk
Assessment one 3hr & one 1.5hr exam/sem, prac & fieldwork

This course is designed to develop the concepts introduced in the Junior course. The main topics covered include: optical mineralogy, geochemistry, petrography, petrogenesis, paleontology, paleoecology, paleoclimatology, petrophysics, exploration geophysics, solid earth geophysics, structuralgeology, tectonic processes, fuels, ores and resources. Students are required to attend a compulsory field excursion during the mid-year vacation.

Environmental Geology 2 Auxiliary — 8 units

Dr Birch (coordinator)
Classes Yr: 3 lec/wk, 4 days fieldwork
Assessment one 3hr exam/sem, field reports

This is a broadly based course on the application of geological principles and knowledge to the problems created by human occupancy and exploitation of the Earth. It examines the fundamentals of hydrogeology, safe disposal of solid and liquid wastes, pollution in the marine environment, responsible extraction of mineral and fuel resources, evaluation of geological hazards, and an examination of the nature of environmental changes on a dynamic planet. Four one-day field workshops will provide students with practical experience in evaluating, and monitoring actual and potential environmental problems in the Newcastle-Sydney-Wollongong conurbation.

Geology 3 — 24 units

Mr Stienstra (coordinator)
Qualifying course Geology 2
Classes Yr: (3 lec & 3 prac)/wk
Assessment three 2hr exams/sem, assignments

This is the core course in geology at the Senior level and may be taken with Geology 3 Additional, Geophysics 3, with a Senior course offered by another science Department or serve as the sole Senior course required for the BSc degree. The coturse Geology 3 treats in some depth a conspectus of modern earth science. Study in the first semester emphasises

materials: mineralogy; igneous, sedimentary and metamorphic petrology; sedimentary resources; micropalaeontology; and ore deposits. The second semester program leads from solid earth geophysics, through basin studies to geotectonics and concludes with a critical review of the evolution of the Australian continent.

Two field excursions, each of about one week's duration, are required components of the Geology 3 course; class-teaching time is adjusted accordingly. Provision may be made for an optional third excursion during the year.

Geology 3 Additional 24 units

Mr Stienstra (coordinator)
Coreq Geology 3
Classes Yr: (12hr of lec & prac)/wk
Assessment two 3hr exams/sem, assignments

Students intending to proceed to an honours year in Geology are strongly advised to.take two Senior courses in the Department of Geology and Geophysics.

Geology 3 Additional involves advanced study in the fields of structural analysis, petrology, biostratigraphy and geochemistry, as well as coverage of such topics as engineering geology, mining and sedimentary basin geophysics, and petroleum geology. For further information, students are encouraged to consult the course and general information handbook produced by the Department.

Field studies are an important component of Senior Geology courses, and two excursions, each of about one week's duration, are a compulsory part of Geology 3 Additional; class teaching time is reduced accordingly.

Geophysics 3 24 units

Mr Stienstra
Coreq Geology 3, Applied Mathematics 3 or Applied Mathematics 3 (Advanced), Physics 3, or Pure Mathematics 3 or Pure Mathematics 3 (Advanced)
Classes Yr: (12hr of lec & prac)/wk
Assessment two 3hr exams/sem, assignments

This third year course is designed to prepare students for a professional career in geophysical exploration for mineral resources, or in the on-site investigation industry.

The lectures, practicals and tutorials cover the physics of rocks, potential field analysis (gravity and magnetic data interpretation), electrical methods, regional geophysics, engineering geophysics, mining geophysics, seismic techniques, borehole geophysics, and the geophysics of sedimentary basins.

Details of course contents, lecturing staff, recommended texts and references are available from the Department.

Excursions in mining geophysics and seismic methods may be run, depending on the availability of projects.

Honours

Dr Clarke (coordinator)

Suitably qualified students maytakeHoursinGeology orGeophysics.Theyarerequired to undertake aresearch project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take honours may be given permission to enrol in the Graduate Diploma inScience.

Further details are available from the Head of Department.

Postgraduate study

Details concerning fields of postgraduate study in the Department of Geology and Geophysics may be obtained from Dr J. Keene or the Head of Department.

History and Philosophy of Science

The History and Philosophy of Science courses are intended to provide a broad, socially relevant appreciation of the scientific enterprise. The educational objective of the courses is to enable students to stand back from the specialised concerns of their other subjects and gain some perspectives on what science is, how it came to acquire its modern form, and how it fits into contemporary society.

It is envisaged that the course will prove relevant to students pursuing any of a large number of possible scientific careers, especially those involving science administration or education.

Location
Carslaw Building, Level 4.

Advice on courses
A member of staff will be available to advise on courses during the enrolment and orientation periods, either in the enrolment centre or in the History and Philosophy of Science Office.

Handbook
Detailed information on courses is available from the History and Philosophy of Science Office.

Registration
Students will need to register in tutorials. Arrangement for this will be made in lectures at the beginning of the year.

History and Philosophy of Science 2 Introductory 8 units

Assoc. Prof. Chalmers, Dr Shortland, Dr Rasmussen
Classes Yr: (2 lec & 2 tut)/wk
Assessment one take-home exam/sem, tutorial assignments

Lectures in the first semester give an introduction to the philosophy of science and those in the second semester deal with the scientific revolution of the sixteenth and seventeenth centuries.

History and Philosophy of Science 3 24 units

Assoc. Prof. Chalmers, Dr Shortland, Dr Rasmussen

Students taking this course are reminded that they must complete an additional Senior course in order to qualify for the degree of BSc.

The course is divided into four segments: (i) a core

course either on the history of the physical sciences or on the history of the biological sciences in the first semester, (ii) a core course on the social relations of science which runs through the year, (iii) two two-hour per week options or the equivalent, normally in the second semester; and (iv) a two-hour per week seminar which runs throughout the year.

History of the Physical Sciences
Assoc. Prof. Chalmers
Prereq Chemistry 1 or Chemistry 1 (Advanced) or Physics 1 or Physics 1 (Advanced)
Classes Sem 1: (two 1hr lec & one 2hr tut)/wk
Assessment one take-home exam, tutorial work

or

History of the Biological Sciences
Dr Shortland
Prereq Biology 1 or Biology 1 (Advanced)
Classes Sem 1: (two 1hr lec & one 2hr tut)/wk
Assessment one take-home exam, tutorial work

Social Relations of Science
Dr Rasmussen
Classes Yr: (1 lec & 1 tut)/wk
Assessment one take-home exam, tutorial work

Options
Two 2hr per week one semester options or the equivalent to be taken.

Philosophy of Science: Kinds of Objectivity
Dr Price
Classes Sem 1: 2 lec/wk
Assessment one 2000w essay, one 2hr exam

Memory
Dr Spence
Classes Sem 2: 2hr seminar/wk
Assessment assignments, classwork

Philosophy of Physics: The Rise and Fall of Mechanism
Dr Gaukroger
Classes Sem 1:2 lec/wk
Assessment one 2000w essay, one 2hr exam

Philosophy of Physics: Modern Physics
Dr Price
Classes Sem 2: 2 lec/wk
Assessment one 2000w essay, one 2hr exam

History and Philosophy of Medicine: Bodies in History
Dr Hardy
Classes Sem 1: (1 lec & 1 tut)/wk
Assessment class work/essay

Scientific Controversies
Dr Hardy
Classes Sem 2: (1 lec & 1 tut)/wk
Assessment classwork, one 2500w essay

Hume and Causation
DrHeathcote
Classes Sem 1:2 lec/wk
Assessment one take-home exam, one essay (2000w for 2nd yr and 3000w for 3rd yr)

Australia in the Nuclear Age
Prof. MacLeod
Classes Sem 1:2 lec/wk
Assessment classwork, one 3000w essay, one 3hr exam

Locke and Empiricism
Prof. Campbell
Classes Sem 2:2 lec/wk
Assessment one 2000w essay, one 2hr exam

Descartes and Rationalism
Dr Gaukroger
Classes Sem 1:2 lec/wk
Assessment one 2000w word essay, one 2hr exam

The Presocratics
Dr Benitez
Classes Sem 1:2 lec/wk
Assessment one 2000w essay, one 2hr exam

History and Philosophy of Psychology
Dr McMullin, Ms Turtle
Prereq Psychology 2A
Classes Yr: (1 lec & 1 tut)/wk
Assessment one 1hr exam, one 2500w essay

(This full-year option is the equivalent of two 2hr per week single semester options.)

The Nature-Nurture Controversy
Ms Turtle
Prereq Psychology 1
Classes Sem 2: (1 lec & 1 tut)/wk
Assessment one 2hr exam, tutorial work

Note: Most of the above options are courses offered in other Departments. When this is so, students will not be able to count those courses both for History and Philosophy of Science and for courses in the Departments offering them.

Seminar
Classes Yr: one 2hr seminar/wk
Assessment class work

A two-hour seminar designed to give students the help they will need with reading, library work and essay writing.

Note: There is a possibility that adjustments can be made to the timetable for the lectures in the core courses if there are significant clashes. Any such clashes should be reported to a History and Philosophy of Science staff member as soon as possible.

Marine Sciences

The Marine Studies Centre offers Intermediate, Senior and Honours courses of an interdisciplinary nature in the marine sciences. Staff from the School of Biological Sciences, the Department of Geography and the Department of Geology and Geophysics teach in the undergraduate program.

Marine Sciences 2 Introductory 8 units
Intermediate Introductory course
Classes Yr: (3 lec & 1 tut)/wk, 1 day excursion
Assessment one 3hr exam/sem, classwork

Introduction to oceanography and its history; the morphology, geology and history of the continental shelves, continental slopes and ocean basins; ocean properties and circulation, ocean-atmosphere and ocean-sea floor relationships; physical processes affecting the coastal zone; chemical cycles within the oceans; major biological systems of the oceans and their evolution; biological adaptation.

Marine Sciences 3 — 24 units

Qualifying course Introductory Marine Sciences

General. This course is for Senior students of biology, geology, geography or mathematics who are interested in the marine sciences. It can, however, be taken with a Senior course in any other subject. No special requirement of first year courses is laid down.

Internal structure. Within the course, options are available in each Semester. Students are encouraged to select those in which they have a particular interest, subject to the unavoidable requirement in some cases that they have completed some prior study in that subject area.

No student enrolled in Marine Sciences 3 can undertake a full year (two semesters; 24 units) in options offered by a single subject area (i.e. Marine Biology or Coastal Geography).

The options, with the prerequisite study additional to Introductory Marine Sciences indicated in parentheses, are listed below. The course marked * is a 12-unit option, all others are 6-unit (half-semester) options.

Chemical Processes in the Oceans
Coastal Depositional Environments
Coastal Morphodynamics
Coastal Zone Management
Evolution and Diversity of the Australian Biota (Biological Sciences, course 120)
Geographic Information Systems
Marine Biology [Biological Sciences, course 124; Biology 2 (Animals) or Biology 2 (Plants)]
*Marine Ecology [Biological Sciences, courses 220 and 221; Biology 2 (Animals)]
Palaeoceanography and Climate Change

The options are usually provided in the form of three or four lectures together with eight or nine hours' practical or project work and, in some cases, a one-hour tutorial each week. Some include an excursion of several days' duration. Not every option is available each year.

Notes:

(a) The course options in coastal geography topics may not be counted in both Marine Sciences 3 and Geography 3P, and are held at the times scheduled for Geography 3P.

(b) The options in marine biological topics may not be counted in both Marine Sciences 3 and Biology 3, and are held at times scheduled for Biology 3.

(c) Owing to the limited facilities available for the marine biological courses it may be necessary to restrict the number taking any particular option. If this need arises selection will be based on academic merit.

(d) Evolution and Diversity of Australian Biota and Marine Biology options are half-semester courses (6 units) and will be offered in first semester. Marine Ecology is a whole semester course (12 units) which must be taken in its entirety and is offered in second semester. This course consists of a core course and the Marine Ecology elective of the Biology 3 option 'Ecology'.

(e) All students intending to enrol in any of the marine biological options must consult the booklet *Information for Students in Biology* 3 available from the School of Biological Sciences office during the last few weeks of the academic year prior to this enrolment. Each student should also complete a preliminary enrolment form in the School of Biological Sciences before first semester commences.

(f) Studentsintendingtoenrolincoastalgeography options should complete a preliminary enrolment form in the Department of Geography before first semester commences.

Enrolment and registration

In addition to complying with enrolment procedures required by the University, all students in Marine Science 3 must register with the Marine Studies Centre during the first week of lectures. Enquiries should be made to the course coordinator (Dr A. Short of Geography). All enrolments must be approved by the Director of the Marine Studies Centre.

Noticeboards

Please consult the Marine Sciences noticeboard on level 2 of the Department of Geology and Geophysics, Edgeworth David Building.

Summaries of course options

Students should consult handbook entries for details on course options as listed in the three contributing Departments/Schools (Biology, Geology and Geophysics, Geography).

Marine Geology

DrKeene

Classes Sem 1 (weeks 8-14): (3 lec, 1 tut, 6 prac)/wk, 1 day excursion

Assessment one 1.5hr exam, classwork

This option will examine in detail aspects of modern marine sediments, emphasising sedimentary processes on continental shelves, including coral reefs, continental margins and ocean basins.

Chemical Processes in the Oceans

Drlsern

Classes Sem 2 (weeks 1-6): (4 lec, 1 tut, 2 prac)/wk

Assessment one 1.5hr exam, classwork

This course provides an overview of organic and inorganic chemical processes in the oceans, particularly inrelation to circulation, sedimentation and biological processes. Topics include properties of seawater, biological cycling of nutrients, carbon and carbonate cycles in the ocean, reactions within the sediments and exchanges with seawater, uses of stable isotopes, glacial-interglacial changes in the ocean chemistry and anthropogenic influences.

Coastal Depositional Environments

Dr Isern

ClassesSeml (weeks 1-7): (21ec&1 tuf)/wk, excursion (over 2 weekends, 1x1 day)

Assessment assignments, exams

The aim of this course is to examine the form and process relationships that generate the world's major coastal deposition environments and to determine their long term evolution through examination of their surface morphology and three dimensional stratigraphy. More specifically, the course will examine sediment transport and deposition, nature and influence of sediment characteristics, and the energy regime and morphology of the receiving basin that combine to produce a coastal depositional environment. The long term evolution of particular coastal deposition environments will be examined in the context of variation in the above parameters along with the variation in the Quaternary climate and sea level.

Coastal Morphodynamics

DrCpwell

Classes Sem 1 (weeks 8-14): (3 lec, 1 prac, 1 tut) / wk, excursion (over 1 weekend)

Assessment assignments, exams

Coastal Morphodynamics is a course in the modelling of complex environmental systems. Specifically, the course concerns the interactions between fluid dynamics and changes in coastal geomorphology over a wide range of scale in space and time. More generally, the coast is used for exploring development and application of computer models for simulating the behaviour of complex environmental processes. Such processes involve non linear dynamical problems that go beyond the realm of classical mathematics and physics. Computer simulation of these problems provides practical insights into the application of chaos theory to the evolutionary behaviour of coasts. The course aims to provide: 1) skills in managing complex problems in general, 2) an analytical understanding of coastal processes in particular, and 3) experience in application of computer-simulation programs and vocationally-relevant, commercial software packages. Practical work involves extensive use of computers.

Coastal Zone Management

Dr Chapman

Classes Sem 2 (weeks 1-7): (3 lec, 1 prac, 1 tut)/wk, excursion (over 1 weekend)

Assessment assignments, exams

The coastal zone provides an ideal area for the study of resources management since virtually all the central concerns of resources management are exemplified in that zone. Hence, the structure of the course will be determined by these concerns, with the application to the coastal zone providing the central unifying theme. Critical physical systems and natural hazards in the coastal zone are given due emphasis, and in addition the course addresses ways in which decisions are made about resources management and some of the models which can usefully be employed in this regard.

Geographical Information Systems

DrCowell

Classes Sem 2 (weeks 8-14): (3 lec, prac, 1 tut)/wk, excursion (over 1 weekend)

Assessment assignments, exams

Principles involved in computer-based geographic information systems are applied to environmental assessment and management of coastal drainage catchments. The course focuses on the development and application of GIS models for strategic planning. It is structured around an exercise in location-analysis within a coastal catchment. The exercise is undertaken in three-hour computer sessions during each week of the course. Lectures provide background to the techniques employed, such as satellite-image processing, transformation and analysis of spatial data and decision support simulation. An overview is also given of the information technology upon which the GIS industry is based. The course aims to provide: 1) an applied understanding of concepts in strategic planning in environmental problems, 2) problem-solving techniques of GIS in environmental assessment and strategic planning, and 3) vocational skills in computing and reporting. Practical work involves extensive use of computers.

Palaeoceanography and Climate Change

Dr Isern

Classes Sem 2 (weeks 8-14): (4 lec, 1 tut, 2 prac)/wk

Assessment 1.5hr exam, classwork

Climatic changes over time have greatly influenced oceanic biology, chemistry and environments on earth. This course will examine evidence for climatic change found in the marine geological and chemical records. Climatic change on long (million and billion year) and short (thousand year) time-scales will be discussed. This option will review the natural changes in climate which have occurred over time and also those which are anthropogenically induced.

Marine Sciences Honours

The structure of the course will be about one-third formal coursework, seminars and reading, and about two-thirds devoted to preparation of a thesis on a topic with a clear marine or estuarine orientation. The formal coursework may comprise courses mainly chosen from existing honours course options offered in the Department of the student's principal interest. Background study in a subsidiary field of interest may be required, depending on circumstances.

Thesis work will commence in February and continue to November.

In general, a credit or better in Marine Sciences 3 and at least a pass in another Senior course are required for entry.

Students interested in undertaking the course should discuss this with the course coordinator for Marine Sciences, preferably during second semester of year 3 and otherwise as soon as possible after publication of the third year examination results. Arrangements for their supervision and Department of primary location will be made in the light of their proposed thesis topic. Joint supervision involving

staff of more than one Department may be arranged if a thesis topic is deemed to be interdisciplinary. Upon acceptance, students should register formally with the Director of the Marine Studies Centre.

Postgraduate study

Details concerning fields of postgraduate study in Marine Science courses offered to postgraduate students, and admission requirements may be obtained from Professor A.J. Underwood (Director of the Marine Studies Centre), Dr R. Hinde, Dr J. Keene or Dr A. Short.

School of Mathematics and Statistics

The School of Mathematics and Statistics offers courses in Applied Mathematics, Mathematical Statistics and Pure Mathematics.

The Junior courses available are Mathematics 1 or Mathematics 1 (Advanced) and Mathematics 1 (Life Sciences).

Intermediate, Senior and Honours courses are mostly taught in a single subject area.

Applied Mathematics is concerned with the development of mathematical and computing methods and their application in particular contexts which may arise in the natural sciences, engineering, economics or the social sciences. Courses are designed to give training to students who will specialise in other subjects, and also for training applied mathematicians. While mathematical rigour is not neglected, particular emphasis is given to questions such as the treatment of observational models which are relevant to particular contexts.

Mathematical Statistics is concerned with the theory of probability and the mathematical methods of statistics applied to such problems as statistical inference, the design of experiments and sample surveys and all problems of data analysis. The major courses are designed to train those who wish to become professional statisticians, tertiary teachers and research workers, but there are courses which provide a knowledge of statistical methods and techniques for students specialising in other fields.

Pure Mathematics courses have two main aims. One of these is the equipping of students with the background of mathematical knowledge, understanding and skill necessary for courses in many branches of science. The other is the provision of training in pure mathematics necessary for those who wish to make a career in mathematics, either in teaching or research or in one of the many avenues where highly developed mathematical ability and a thorough knowledge of modern mathematical techniques are required, such as computing, operations research, management, finance and economics.

Location
The School is located in the Carslaw Building.

Notieeboards and registration
Details of locations of notieeboards and of registration for specific courses are available in the course handbooks available at the time of enrolment or during the first week of lectures.

Advice on courses
School advisers are normally available during the enrolment period. There are lists of advisers for specific courses at the front of this handbook and in the course handbooks.

Junior courses

Mathematics 1 (Life Sciences) 12 units

AKn HSC 2-unit Mathematics
Classes Yr: (4 lec & tut)/wk
Assessment (two 2hr exams & 4 assignments)/sem, computer project

Content
This is a one-year course in mathematics intended to give a rounded view of mathematics and particularly designed for students intending to major in the life and social sciences. Topics covered include differential and integral calculus, linear algebra and statistics.

There are comprehensive details of the Mathematics 1 (Life Sciences) course in the *Mathematics First Year Handbook,* distributed at the time of enrolment.

Assumed knowledge
Knowledge equivalent to the 2-unit HSC course is assumed. Students who do not have this knowledge are strongly advised to attend a bridging course conducted by the School in February.

Relation to other courses
Mathematics 1 (Life Sciences) counts as a 12-unit Junior course and may not be counted together with Mathematics 1 or Mathematics 1 (Advanced). It does not normally qualify students for second year mathematics courses. However students gaining a credit may, with the permission of the Head of School, proceed to Mathematical Statistics 2, Pure Mathematics 2 or Applied Mathematics 2.

Mathematics 1 12 units

AKn HSC 3-unit Mathematics
Classes Yr: (5 lec & 2 tut)/wk
Assessment (two 2hr exams & 4 assignments)/sem

Mathematics 1 is designed to provide a thorough preparation for further study in mathematics and statistics as well as to satisfy the requirements of first year courses in the mathematical sciences in the Faculties of Science and Engineering. Itis the qualifying course for all Intermediate mathematics courses.

There are comprehensive details of the Mathematics 1 course in the *Mathematics First Year Course Handbook,* distributed at the time of enrolment.

Content
Semester 1 Plane curves, functions of one variable; differentiation and applications; vectors; curves and surfaces in three dimensions; functions of two and more variables; partial differentiation; discrete mathematics; statistics.

Semester 2 Integration and applications; Taylor polynomials; complex numbers; ordinary differential equations and applications; mathematical modelling; linear algebra.

Assumed knowledge
Knowledge equivalent to the 3-unit HSC course is assumed. Students who do not have this knowledge are strongly advised to attend a mathematics bridging course conducted by the School in February.

Mathematics 1 (Advanced) 12 units

AKn HSC 3-unit Mathematics
Classes Yr: (5 lec & 2 tut)/wk
Assessment (two 2hr exams & 4 assignments)/sem

This advanced course is available to students with a very good record in high school mathematics who wish to take a course of a more challenging nature. All students aiming for high achievement, such as an honours degree or postgraduate study, are advised to enrol in Mathematics 1 (Advanced).

The course content is similar in outline to that of Mathematics 1 but proceeds at a faster rate and covers more difficult material. There are comprehensive details of the Mathematics 1 (Advanced) course in the *Mathematics First Year Course Handbook,* distributed at the time of enrolment.

Intermediate courses

Applied Mathematics 2 16 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced) [or, with permission of the School, a credit or better in Mathematics 1 (Life Sciences)]
Classes Yr: (8hr of lec, tut & computer lab)/wk
Assessment generally one 2hr exam/option, assignments

This course consists of options which are taught at either the O or A level. Most students take the O level options, but A level options may be substituted. Each student must take two course options per semester. An option consists of four contact hours per week (usually three lectures plus one tutorial). Full details of course structure, content and examination procedures are provided in the course handbook distributed at the time of enrolment.

O options: Vector calculus and complex variables; ordinary and partial differential equations and Fourier series; optimisation; dynamical systems; mathematical computing and simulation; deformable media.

A options: Functions of several variables and of a complex variable; complex variable techniques, ordinary and partial differential equations, Fourier series and special functions; Lagrangian dynamics; mathematical computing and simulation, deformable media and waves.

Applied Mathematics 2 (Advanced) 16 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (8hr of lec, tut & computer lab)/wk
Assessment generally one Zhr exam/option, assignments

Entry to the Advanced course usually requires a credit or better in either of the qualifying courses. The options are listed under Applied Mathematics 2 above. Students in the Advanced course must take at least three options at the A level. All further information can be found under Applied Mathematics 2.

Mathematical Methods 2 8 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (3 lec & 1 tut)/wk
Assessment two 2hr exams/sem, assignments

This course is intended for students who wish to develop their knowledge of mathematical techniques beyond the level of Mathematics 1 without taking the full Applied Mathematics 2 or Pure Mathematics 2 courses.

The course does not qualify students for any Senior Mathematics course. It is not possible to take Mathematical Methods 2 and Applied Mathematics 2 as separate subjects since the former is a compulsory part of the latter. Full details of course structure, content and examination procedures are provided in the course handbook distributed at the time of enrolment.

Course content
Vector calculus and complex variables, ordinary and partial differential equations and Fourier series.

Mathematical Statistics 2 16 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced) [or Mathematics 1 (Life Sciences) at credit standard]
Classes Sem 1: (5 lec & 1 tut & one 2hrprac)/wk. Sem 2: (4 lec, 1 tut & one 2hr prac)/wk
Assessment two 1.5hr exams/sem, assignments, pracs

This course is both a self-contained one-year course and the basis for a degree specialising in statistics.

The course is presented in four modules. Full details are provided in the course handbook distributed at the time of enrolment.

Modules: Probability; exploratory data analysis; hypothesis testing; estimation and dependence.

Mathematical Statistics 2 (Advanced) 16 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (5 lec & 1 tut & one 2hr prac)/wk
Assessment two 1.5hr exams/sem, extra 2hr exam (Sem 2), assignments, pracs

Entry to the Advanced course usually requires a credit or better in either of the qualifying courses. It covers all of the material of Mathematical Statistics 2 together with extra lectures in second semester on the mathematical theory of probability. Full details are provided in the course handbook distributed at the time of enrolment.

Mathematics 2 Combined 24 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced) [or, with permission of the School, a credit or better in Mathematics 1 (Life Sciences)]
Classes Yr: (12hr of lec, tut & computer lab)/wk
Assessment generally one 2hr exam/option, assignments

This course consists of six options from Pure Mathematics 2 and Applied Mathematics 2 courses, which are taught at either the O or A level. It qualifies

students for entry to both Pure Mathematics 3 and Applied Mathematics 3.

Most students take the O level options, but A level options may be substituted. Full details of course structure, content and examination procedures are provided in the course handbook distributed at the time of enrolment.

Mathematics 2 Combined (Advanced) 24 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (12hr of lec, tut & computer lab)/wk
Assessment generally one 2hr exam/option, assignments

Entry to the Advanced course usually requires a credit or better in either of the qualifying courses. It qualifies students for entry to both Pure Mathematics 3 (Advanced) and Applied Mathematics 3 (Advanced).

Students in the Advanced course must take at least four options at the A level. Full details of course structure, content and examination procedures are provided in the course handbook distributed at the time of enrolment.

Pure Mathematics 2 16 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced) [or, with permission of the School, a credit or better in Mathematics 1 (Life Sciences)]
Classes Yr: (8hr of lec, tut & computer lab)/wk
Assessment generally one 2hr exam/option, assignments

This course consists of options which are taught at either Q or A level; the_A options are generally somewhat more abstract and go deeper into the subject. Most students take the O levels, but A level options may be substituted.

In first semester, all students take two options, each involving four contact hours per week (lectures, tutorials and/or computer lab classes). In second semester, students take either two options at four contact hours or one option at four hours and two options at two hours per week. Full details of course structure, content and examination procedures are provided in the course handbook distributed at the time of enrolment.

O options: Vector calculus and complex variables, ordinary and partial differential equations and Fourier series, real analysis; linear equations and eigenvalue theory, group theory and inner product spaces; finite mathematics.

A options: Functions of several variables and of a complex variable, analysis including ordinary and partial differential equations and Fourier analysis, qualitative theory of differential equations; linear algebra, group theory.

Pure Mathematics 2 (Advanced) 16 units

Qualifying course Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (8hr of lec, tut & computer lab)/wk
Assessment generally one 2hr exam/option, assignments

Entry to the Advanced course usually requires a credit or better in either of the qualifying courses. The options are listed under Pure Mathematics 2 above. Students in the Advanced course must take at least three options at the A level. All further information can be found under Pure Mathematics 2.

Statistical Methods 2 (S1) 8 units

ARn HSC Mathematics (2 unit)
Classes Sem 1: (4 lec, 2 tut, 1 computer prac)/wk
Assessment 3hr exam, assignments, prac

The emphasis in this course is on applications and the material is presented in two streams at the rate of two lectures per week each. Full details are provided in the course handbook distributed at the time of enrolment.

Course content
Data analysis and nonparametrics; statistical distributions and inference.

Advanced Statistical Methods 2 (S2) 8 units

Either
Prereq Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)
Coreq Statistical Methods 2
or
Prereq Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced)
Classes Sem 2: (4 lec, 2 tut, two 1hr computer prac)/wk
Assessment 3hr exam, assignments, prac

This course is based on computer packages and aims to introduce advanced statistical techniques without developing the mathematical theories underlying these methods. The material is presented in two streams at the rate of two lectures per week each. Full details are provided in the course handbook distributed at the time of enrolment.

Course content
Applied linear models; design and sampling.

Senior courses

Applied Mathematics 3 24 units

Qualifying course Applied Mathematics 2 or Applied Mathematics 2 (Advanced) or Mathematics 2 Combined or Mathematics 2 Combined (Advanced)
Classes Yr: (6 lec & 3 tut)/wk
Assessment generally one 2hr exam/option, assignments

This course consists of options which are taught at either the O or A level; some taught separately, others in common (A/O level). Most students take the O level options, but A level options may be substituted.

Each student must take at least six options (three contact hours per week each). Full details of course structure, content and examination procedures are provided in the course handbook distributed at the time of enrolment.

O options: Lagrangian dynamics; applications of PDEs and waves;signal processing; mathematics of financial markets.

A options: Mathematical methods; fluid dynamics; advanced mathematical computing; Hamiltonian dynamics and Hamilton-Jacobi theory.

A/O options: Mathematical computing; nonlinear systems and biomathematics.

Applied Mathematics 3 (Advanced) 24 units

Qualifying course Applied Mathematics or Applied Mathematics 2 (Advanced) or Mathematics 2 Combined or Mathematics 2 Combined (Advanced)
Classes Yr: (6 lec & 3 tut)/wk
Assessment generally one 2hr exam/option, assignments

Entry to the Advanced course usually requires a credit or better in any of the qualifying courses. The options are listed under Applied Mathematics 3 above. Students in the Advanced course must take at least four options at the A level. All further information can be found under Applied Mathematics 3.

Mathematical Statistics 3 24 units

Qualifying course Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced)
Prereq Pure Ma thematics2orPureMathematics2 (Advanced) or Applied Mathematics 2 or Applied Mathematics 2 (Advanced)
Classes Yr: (6 lec & 3 tut & one 2hr prac) / wk
Assessment three 2hr exams/sem, assignments, pracs

The course is presented in six modules. Full details are provided in the course handbook distributed at the time of enrolment.

Modules: Distribution theory; linear models; time series analysis; inference; multivariate analysis; design of experiments.

Mathematical Statistics 3 (Advanced) 24 units

Qualifying course Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced)
Prereq PureMathematics2orPureMathematics2(Advanced) or Applied Mathematics 2 or Applied Mathematics 2 (Advanced)
Classes Sem 1: (6 lec, 3 tut & one 2hr prac)/wk; Sem 2: (8 lec, 3 tut & one 2hr prac)/wk
Assessment Sem 1: three 2hr exams; Sem 2: four 2hr exams, assignments, pracs

Entry to the Advanced course usually requires a credit or better in either of the qualifying courses. It covers all of the material of Mathematical Statistics 3 together with extra lectures in second semester on Markov processes. Full details are provided in the course handbook distributed at the time of enrolment.

Pure Mathematics 3 24 units

Qualifying course Pure Mathematics 2 or Pure Mathematics 2(Advanced)orMathematics2Combined or Mathematics 2 Combined (Advanced)
Classes Yr: (6 lec & 3 tut)/wk
Assessment generally one 1.5hr exam/option, assignments

This course consists of options which are taught at either O or A level, some taught separately, others in common (A/O level). Each consists of two lectures per week, plus tutorials and assignments. The A options are more demanding. Full details are provided in the course handbook distributed at the time of enrolment.

Students taking the course choose at least six options. There is considerable flexibility in the choice of options, and mixtures of O and A are encouraged. Some options are offered in the evening.

If resources permit, options are expected to include the following:

O options: Rings and fields; topology; logic; coding theory; real variable; statistics; number theory; ordinary differential equations; geometry.

A options: metric spaces; algebra; non-linear analysis; combinatorial theory; Lebesgue integration and Fourier analysis; complex variable; topological groups; computational algebra; categories and computer science; differential geometry.

A/O option: History of mathematical ideas.

Pure Mathematics 3 (Advanced) 24 units

Qualifying course Pure Mathematics 2 or Pure Mathematics 2 (Advanced) orMathematics2Combined or Mathematics 2 Combined (Advanced)
Classes Yr: (6 lec & 3 tut)/wk
Assessment generally one 1.5hr exam/option, assignments

Entry to the Advanced course usually requires a credi t or better in any of the qualifying courses. The options are listed under Pure Mathematics 3 above. Students in the Advanced course must take at least four options at the A level. All further information can be found under Pure Mathematics 3.

Honours courses

Applied Mathematics 4

Applied Mathematics 4 consists of both formal coursework and an essay project.

There is also provision for students to take approved courses from other departments. The essay is a substantial par t of the year's assessment and is closely supervised by a staff member.

Entry qualification into the course is a credit or better in Applied Mathematics 3 (or equivalent) and is subject to the approval of the Head of School.

Interested students should consult the course handbook or contact the fourth year course coordinator at some convenient time before enrolment.

Mathematical Statistics 4

Courses of lectures will be given in a selection of advanced topics in the theory of probability and statistics. There is also an essay project which contributes 20 per cent of the total assessment. A talk is required to be given on the project topic. There is also provision for students to attend approved courses from other Departments.

Those wishing to take Mathematical Statistics 4 are asked to consult the fourth year course coordinator during third year. The usual prerequisite for entry is a good credit or better in Mathematical Statistics 3. The final decision for entry rests with the Head of School.

Pure Mathematics 4

Those wishing to take Pure Mathematics 4 are asked to speak to the fourth year course coordinator during

third year. The usual prerequisite,for entry is a good credit or better in Pure Mathematics 3. The final decision for entry rests with the Head of School.

The Pure Mathematics 4 course has two components: lecture courses (which attract approximately 70 per cent of total credit) and an essay project. As part of the essay project, students are required to prepare a talk about their project. Further details are available from the course coordinator and in the course handbook.

Postgraduate studies

The School of Mathematics and Statistics offers a number of postgraduate courses, including both full-time and part-time options.

MA: part-time, with usual entry requirement a pass degree with a major in Mathematics or Statistics.

MSc (Qualifying): full- or part-time for students who do not satisfy the usual entry requirements but seek to enter an MSc degree by coursework or research.

MSc (by coursework and essay): full- or part-time with usual entry requirement an honours degree in Mathematics or Statistics.

MSc (by research): full- or part-time with usual entry requirement an honours degree in Mathematics or Statistics.

PhD: full- or part-time by research.

Further details can be obtained from the Director of Postgraduate Studies in the School.

Mechanical and Aeronautical Engineering Science

The Departments of Mechanical and Aeronautical Engineering are part of the Faculty of Engineering. In addition to providing professional training in mechanical and aeronautical engineering, they offer an 8-unit course. Mechanical and Aeronautical Engineering Science 2, in the Faculty of Science.

The course is available as an Intermediate course in a science degree for students majoringin ma thematics, physics, chemistry, geology, computer science or soil science, and who are thinking of an applied science career in mechanical or aeronautical engineering. Candidates for the BSc degree are not permitted to count more than one of Chemical Engineering Science 2, Civil Engineering Science 2 and Mechanical and Aeronautical Engineering Science 2.

The course is intended to demonstrate the application of scientific principles in an engineering context so that the science student will gain an understanding of some engineering systems.

Double degree
Some Science graduates, who have passed the course Mechanical and Aeronautical Engineering Science 2, may obtain a Bachelor of Engineering degree in Mechanical or Aeronautical Engineering after an additional two years' study. Students wishing to undertake this option must apply through UAC and compete on the basis of academic merit. Information about application procedures is available from the Engineering Faculty Office in the Engineering Link Building.

Location
Further details about admission to the BE degree course in Engineering may be obtained from the Departments of Mechanical and Aeronautical Engineering. They are in the northeast of the Engineering precinct, and can be entered from Shepherd Street. Lectures are normally held in the Peter Nicol Russell theatres.

Noticeboards
All noticeboards are in the foyer areas outside the lecture theatres on Levels 2 and 3. Notices relevant to these subjects will be displayed on the Level 3 noticeboards in the Department of Mechanical Engineering.

Registration
AlLstudents are required to register with Ms K. Thompson on Level 4 in the Mechanical Engineering Building on either the last day of Orientation or on the first day of lectures.

Timetable information on alternative lecture/ tutorial/laboratory/practical classes is available in the Engineering Student Enquiry Office in the PNR Building.

Advice on courses
Members of staff are available during enrolment and orientation periods to give advice about these courses.

Students wishing to see a departmental adviser should apply to the relevant department office.

Tutorials and laboratories
All students are required to undertake the tutorial and laboratory work associated with these courses, details of which are provided in the timetables. The experimental and tutorial work, an integral part of the course, complements the lecture material.

Mechanical and Aeronautical Engineering Science 2 — 16 units

Prereq Mathematics 1 or Mathematics 1 (Advanced) and Physics 1 or Physics 1 (Advanced)

Mechanical Engineering 2

Prereq Mathematics 1 or Mathematics 1 (Advanced).
Mutually exclusive with Mechanical Engineering 2A
Classes Sem 1: (3 lec & one 3hr lab/tut)/wk. Sem 2: (2 lec & one3hrlab/tut)/wk
Assessment one 3hr exam (Sem 1), one 2hr exam (Sem 2), coursework

Syllabus summary
Semester 1

(a) Thermodynamics — concepts, work and heat, property of substances, 1st law of thermo-dynamics, control mass and control volume analysis of power and refrigeration cycles; thermal efficiency, entropy and 2nd law of thermodynamics, reversible and irreversible processes, isentropic efficiency.

(b) Fluids — fluid properties, pressure, shear, hydrostatics, forces, moments, buoyancy,

stability, continuity equations, streamlines, Euler, Bernoulli equations, linear momentum, propulsion, angular momentum, turbo-imachinery, dimensional analysis, boundary layers, pipe flow and friction.

Semester 2

(c) Engineering Mechanics — description of dynamic problems and free body diagrams. Equationsof motion, workand energy, impulse and momentum, moving axis problems. Kinematics and kinetics of rigid bodies: kinematics of system of rigid bodies, mass and mass moment of inertia, translation, rotation and general planar motion. Engineering applications: vibration: linear system equations and steady state response. Dynamics of non-rigid systems.

Textbooks
Cengel and Boles *Thermodynamics* (McGraw-Hill)
Meriam *Dynamics Vol II* IS edn (Wiley)
Potter and Wiggert *Mechanics of Fluids* (Prentice-Hall)

Mechanical Design IA

Mutually exclusive with Mechanical Design 1
Classes Sem 2: (1 lec & two 3hr drawing office sessions)/wk
Assessment assignments carried out during the design office classes and elsewhere

Syllabus summary

(a) Machine Drawing — freehand sketching of machine components. Drafting techniques and standard drawing methods. Orthogonal projections and sections. Dimensioning, tolerancing, conventional symbols, detail and assembly drawings and descriptive geometry.

(b) Machine Design — design process, problem specification, conceptual techniques and design evaluation. Detail design of components including: design loads, failure and facture of safety; calculation approach and presentation conventions; stress effects in shape definition and material selection; ergonomic, manufacturing and assembly considerations; introduction to engineering hardware including fasteners, bearing and mechanical power transmission.

Textbook
Boudny *Engineering Drawing* (McGraw-Hill)

Reference book
Shigley *Mechanical Engineering Design* (McGraw-Hill)

Department of Microbiology

The Department of Microbiology offers courses that equip students for a career in microbiology in fields of health, industry and basic research.

In addition, it provides introductory courses to students of agriculture, pharmacy and science. These courses will help students who wish to specialise in related fields where micro-organisms are often used in studying life processes, e.g. biochemistry, genetics, botany and physiology.

Location
The Department is on Level 5 of the Biochemistry Microbiology Building.

Noticeboards
NoticebOards are in the foyer to Level 5, and inside the student laboratories on Levels 3 and 5. Material displayed includes timetables, job vacancies, lists of seminars and lectures of student interest, as well as general announcements.

Registration
All BSc students (except Pharmacy students) must register with the Department prior to the start of semester. Students will then be allocated to practical classes. Failure to attend may preclude allocation to practical classes.

Advice on courses
A member of staff is generally among the faculty advisers on duty during the enrolment period. In addition, all members of staff are available for consultation throughout the year. Students should apply through the Departmental secretary.

Microbiology 2 — 16 units

Mrs I. Dalins (coordinator)
Qualifying course Biology 1 or Biology 1 (Advanced)
Prereq Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr (3 lec, 1 tut & 4 prac)/wk
Assessment (one 3hr exam, prac, 2 assignments)/sem

This is a general introduction to the subject and is the qualifying course for Microbiology 3. It is also suitable for those who wish to acquire a broad and working knowledge of microbiology while specialising in other subjects.

The topics covered include history and scope of microbiology, methodology, comparison of major groups of micro-organisms, detailed study of bacteria including structure, growth, metabolism and genetics; aspects of applied microbiology such as food and industrial microbiology, microbial ecology (soil, aquatic, agricultural) and microbial pathogenicity, including virology and immunology. The practical course supplements and complements the lecture material.

Semester 1: Introduction to microbiological techniques and the application of these to bacterial taxonomy, as well as an examination of basic activities of the cell.

Semester 2: The study of the impact of micro-organisms on human beings and the environment, with examples taken from medical, food and environmental microbiology.

Textbook
L.M. Prescott *et al. Microbiology* 2nd edn (WC Brown, 1993)

Microbiology 2 (Advanced) — 16 units

Mrs I. Dalins (coordinator)

Selected students will be permitted to participate in alternative components of the Microbiology *2* course. The content and nature of the components may vary from year to year.. Selection criteria and other details are available from the course coordinator at the time of enrolment.

Microbiology 2 (Theory) Auxiliary (A) 8 units

Prereq Biology 1 or Biology 1 (Advanced)
Classes Yr: (3 lec & 1 tut or 1 prac)/wk
Assessment one 3hr exam/sem

This is a terminating course that offers students exposure to limited practical experience, but is suitable for students who are majoring in other aspects of biology and who wish to acquire a broad background knowledge of microbiology.

The topics covered include history and scope of microbiology, methodology, comparison of major groups of micro-organisms, a detailed study of bacteria, including structure and function; aspects of applied microbiology, such as food and industrial microbiology, microbial ecology (soil, aquatic, agricultural) and microbial pathogenicity including virology and immunology.

Textbook
As for Microbiology 2

Microbiology 2 (Theory and Techniques) Auxiliary (S1) 8 units

Prereq Biology 1 or Biology 1 (Advanced)
Classes Sem 1:3 lec/wk
Assessment one 3hr exam, prac, 2 assignments

This terminating course is suitable for students who are majoring in other aspects ofbiology and who wish to acquire an introduction to microbiology and, particularly, microbiological techniques. This course is the first half of Microbiology 2.

The topics covered include history, basic methodology, comparison of main groups of microorganisms, and a detailed study of bacteria, including structure and function.

The practical course is designed to complement lecture material and to give practice in basic microbiological techniques.

Textbook
As for Microbiology 2

Microbiology 3 24 units

Dr T. Duxbury (coordinator)
Qualifying course Microbiology 2
Prereq Biochemistry 2 or Biochemistry 2 Auxiliary or Agricultural Chemistry 2 or Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) (Auxiliary) (Advanced)
Classes Yr: (4 lec & 8 prac)/wk
Assessment Sem 1: two 2hr exams, prac
Sem 2: one 2hr & one 1.5hr exam, prac

This course is for students wishing to make a career in microbiology and comprises 109 lectures, 189 hours of practical work, and 32 hours of a variety of other course-related activities. The course covers three general areas:

1. Medical Microbiology - medical bacteriology, virology, serology.
2. Molecular Microbiology - bacterial structure and function, prokaryote evolution and taxonomy, molecular pathogenesis, genetic regulation and bacterial physiology, bacterial and phage genetics.
3. Applied and Environmental Microbiology - microbial ecology, planNmicrobe interactions, food microbiology, pollution microbiology.

The practical course complements the lecture course and includes project work and excursions to industrial and medical institutions.

Reference books
To be announced

Microbiology 3 (Advanced) 24 units

Dr T. Duxbury (coordinator)

Selected students will be permitted to participate in alternative components of the Microbiology 3 course. The content and nature of the components may vary from year to year. Selection criteria and other details are available from the course coordinator at the time of enrolment.

Microbiology Honours

Prereq credit level pass in Microbiology 3

Candidates for the honours course should consult the Head of Department as soon as examination results are published.

During the honours year, students undertake a research program to produce a thesis and simultaneously broaden their knowledge of general microbiology through reading and Departmental seminars. Towards the end of the year they are required to prepare and deliver a seminar on their research project.

Department of Pharmacology

This Department offers a general training in pharmacology to students in the Faculty of Science studying for the BSc, BMedSc and BPharm degrees. It provides an introductory 8-unit course and a Senior 24-unit course for BSc students.

Location
The Department is located within the Medical School onFloor 2 (the ground floor) of the Blackburn Building, and Levels 1 and 2 of the adjoining Bosch Building.

Noticeboards
Information for students may be found on the noticeboard inside the main door of the laboratory wing of the Department on Level 2 of the Bosch Building.

Registration
All intending students should register with the secretary in Room 221 in the Bosch Building Level 2 before enrolment.

Advice on courses
Science students may consult Dr Spence or other members of the teaching staff for advice before enrolment. A member of the Department may also be present among faculty advisers during the enrolment period.

Pharmacology 2 Introductory 8 units

Dr Robin Allan (coordinator)
Prereq Biology 1 or Biology 1 (Advanced) and Chemistry 1 or Chemistry 1 (Advanced)
Classes Yr: 2 lec/wk & nine 6hr pracs
Assessment one 2hr exam/sem, classwork

Sites at which drugs act. Receptors and' basic mechanisms of drug action. Binding-effect relationships. Drug absorption, distribution, and metabolism. Relationships between drug activity and chemical structure. Effect of drugs on the autonomic nervous system. Drugs used for pain and inflammation. Basic factors in toxicology. Social use of drugs. '

Textbook
H.P. Rang and M.M. Dale *Pharmacology* (Churchill Livingstone, 1991)

Study aids
R. EinsteinP/wrmacoZogy, *Self-assessment Questions for Students* (Butterworths, 1989)
M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books
A.G. Gilman *et al. Goodman and Gilman's Tlie Pharmacological Basis of Therapeutics* (Pergamon Press, 1990)
B.G. Katzung (ed.) *Basicand Clinical Pharmacology*' (Appleton & Lange, 1989)

Pharmacology 3 24 units

Dr Ian Spence (coordinator)
Qualifying course Pharmacology 2 (Introductory)
Classes Yr: (4 lec & 2 tut & 6 prac)/wk
Assessment two 3hr exams/sem, classwork

Semester 1: Molecular pharmacology and toxicology
Work in this semester covers two major areas of pharmacology: (1) toxicology, and (2) drug design and development.

The toxicology area covers metabolism of toxic substances, toxicity to major organs, epidemiology and carcinogenesis. It aims to provide an overview of the topic with detailed examination of selected issues in toxicology. Drug design and development looks at the principles guiding the development of new therapeutic agents, for example new histamine antagonists and the use of new methods to study drug distribution and action such as positron emission tomography (PET) and single photon emission computerised tomography (SPECT) scanning. As part of the course all students prepare a drug profile — a document similar to that required by regulatory authorities when a new drug is introduced. This provides students with the opportunity to become familiar with, firstly, regulatory procedures and secondly with the detailed pharmacology of one particular compound.

Semester 2: Neuropharmacology, cardiovascular pharmacology and respiratory pharmacology
The lecture course in this semester provides a comprehensive, systematic study of three major areas of pharmacology: (1) neuropharmacology, (2) cardiovascular pharmacology, and (3) respiratory pharmacology. The neuropharmacology component examines the actions of psychoactive drugs at all levels from single cells through to behaviour. The cardiovascular and respiratory components examine therapeutic intervention in disease states such as hypertension and asthma and the mechanisms of drug action.

In addition to the core course students choose an elective selected from a number offered by the Department. These cover specific topics in depth and some are laboratory based. Details of these are available from the Department before the commencement of second semester.

Textbook
H.P. Rang and M.M. Dale *Pharmacology* (Churchill Livingstone, 1991)

Study aids
R. *EmsteinPluirmacology Self-assessment Questions for Students* (Butterworths, 1989)
M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books
J.R. Cooper *et al. The Biochemical Basis ofNeuropliarmacology* (Oxford, 1991)
A.G. Gilman *et al. Goodman and Gilman's The Plmrmacological Basis of Therapeutics* (Pergamon Press, 1990)
C.D. Klaasen *Casarett & Doull's Toxicology, The Basic Science of Poisons* (Macmillan)
P. Krogsgaard-Larsen and H. Bundgard (eds) *A Textbook of Drug Design and Development* (Harwood Academic Publishers, 1991)

Pharmacology 3 Advanced 48 units

Subject to the approval of the Head of the Department of Pharmacology, exceptional students may take pharmacology at an advanced level, instead of the normal level. This comprises Pharmacology 3 together with Pharmacology 3 Additional. The combination involves extended practical work and seminar periods occupying approximately 24 total hours a week, and may include attendance at certain lectures in a related subject.

Textbooks and reference books
As for Pharmacology 3

Pharmacology Honours

Dr R. Einstein (coordinator)

Subject to a satisfactory standard being attained in Pharmacology, a student may arrange to read for the honours degree in this subject. Much of the work will be arranged to suit the interest of the individual. The studentwill participate inaresearch project in progress in the Department. A literature review and a written report on the research project must be prepared. Seminars on the literature review, the project and another chosen topic will be given by the student.

School of Physics

The School of Physics provides undergraduate courses in physics in a four-year sequence, Physics 1-4, for students wishing to take the BSc honours degree in Physics. The three-year sequence, Physics 1-3, is taken by candidates for BSc pass, or for BSc honours in

another subject, who wish to take physics as one of their major subjects. Several other faculties and other departments within the Faculty of Science require that Physics 1 or Physics 1 (Advanced) be taken as part of the students' preparation for later studies in their more specialised fields. Similarly Physics 2 courses are taken by many Faculty of Engineering students, as well as by many Faculty of Science students who intend to major in other subjects

Location
Physics 1: Lectures in Physics Building, laboratories in Carslaw Building
Physics 2-4: Physics Building

Noticeboards
In the Physics Building as appropriate for each course.

Registration
Physics 1: At normal laboratory periods during the first week of lectures in first semester. Carslaw First Year Laboratories.
Physics 2: At first lecture, in Physics Building. See noticeboard for allocation of lecture theatres.
Physics 3: At first lecture, in Physics Building. Consult noticeboard early in the orientation period.

Advice on courses
A member of the physics staff is normally present among faculty advisers during enrolment week to advise intending first year students. Subsequent to this, if you want to see an adviser, the first year secretary will arrange it. Student advisers for later year courses (see chapter 2) may be consulted in the Physics Building.

Secretary
First year secretary, Room 202, Physics Building.

Information booklet
Further information about first year physics courses is contained in a booklet for intendingfirst year students available at enrolment or during Orientation or from the first year secretary.

First Year Physics courses

These are offered at two levels: Physics 1 (Advanced) and Physics 1. Both provide a sound foundation for a further study of physics. Physics 1 (Advanced) is available to students with a very good record in physics (TERs at least 95.0 and 2-unit Physics scores at least 90) and proceeds faster than the Regular strand of Physics 1, covering further and more difficult material.

Physics 1 — 12 units

AKn Regular: Physics 2-unit or the Physics core of the 3/4-unitSciencecourse. Fundamental: noassumed knowledge
Coreq any Junior Mathematics course
Classes Yr: (3 lec/tut & 3 prac)/wk
Assessment (one 3hr & one 1.5hr exam)/sem, classwork, (Sem 2: one optional 2hr exam for distinction grades)

• In each semester students choose between two strands. In the first semester the available strands are labelled Fundamental and Regular. The Fundamental strand is for those who have not studied physics before or who have had major difficulty with the subject at the HSC level. Certainly students who have scored 65 marks or better in 2-unit Physics or the equivalent should not enrol in this strand.

In the second semester the available strands are Environmental and Life Sciences, and Physical and Technological Sciences.

Students can move from either strand in first semester to either strand in second semester.

Students may apply to the Head of School for permission to move from Physics 1 to Physics 1 (Advanced) at the start of second semester.

In each semester there are three 4-week modules.

Content of modules
Semester 1
Fundamental: Introduction to Physics, Mechanics, Energy Transfer and Waves
Regular: Mechanics, Fields and Flow, Energy Transfer and Waves

Semester 2
Environmental Life Sciences: Electricity, Properties of Matter, Atoms andNuclei
Physical and Technological Sciences: Electricity, Thermal, Materials Physics

Laboratory work
Each strand has an associated course of thirteen 3-hour sessions covering various components which vary slightly between the strands but which include some or all of mechanics, electrical circuits, optics, measurement, computational physics and a number of problems and experiments.

Textbooks
D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics* 4th edn (John Wiley, 1993), together with additional handout material, where appropriate.
L. Kirkup *Experimental Methods* 1st edn (John Wiley, 1994)

Physics 1 (Advanced) — 12 units

AKn Physics 2-unit of the Physics core of the 3/4-unit Science course
Coreq Mathematics 1 or Mathematics 1 (Advanced)
Classes Yr: (3 lec/tut & 3 prac)/wk
Assessment (one 3hr & one 1.5hr exam)/sem, classwork, (Sem 2: one optional 2hr exam in for distinction grades)

Students can change their enrolment from Physics 1 (Advanced) to Physics at any time.

In each semester there are three 4-week modules.

Content of modules
Semester 1: Mechanics, Fields and Flow, Waves and Chaos
Semester 2: Electricity, Thermal, Special Topics

Laboratory work
There is a course of thirteen 3-hour sessions covering various components which include electrical circuit, optics, measurement, computational physics and a number of problems and experiments.

Textbooks
D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics* 4th edn (John Wiley, 1993), together with additional handout material, where appropriate.
L. Kirkup *Experimental Methods* 1st edn (John Wiley, 1994)

Physics 2 — 16 units

Dr Tango

Qualifying course Physics 1 or Physics 1 (Advanced)
Prereq Mathematics 1 or Mathematics 1 (Advanced)
Classes (4 lec & 4 prac)/wk for part year; (3 lec, 3 prac & 2 microlab)/wk for part year .
Assessment (two 2.5hr exams & 4 assignments)/sem, 2 prac reports, microlab (report & test)/sem

The lecture course includes the following topics: introductory electrodynamics*, astronomy, geometrical and physical optics*, quantum physics* (including and introduction to solid state physics and particle physics). The topics marked with (*) are offered at both Advanced and Normal levels. Entry to Advanced level courses is restricted to students who achieved a grade of credit or better in Physics 1 (or equivalent). The principal difference between the two levels is that material is covered in greater depth and at a higher level of abstractionin the Advanced stream. Both levels, however, provide an adequate standard for entry into Physics 3.

Computational physics is taught in two-hour sessions in a PC-based computing laboratory. Sessions are held once a week for ten weeks in both semesters. An introductory session is held in the first week of first semester for students who are not familiar with programming wi th a personal computer. The material for this course is drawn from one of the concurrent lecture courses (quantum physics). Students work in teams of three. Each team does a short project in the last two sessions and submits a short report. There is also a one-hour test which is administered individually.

Experimental Physics is taught as a laboratory course of four-hour sessions for most of the year, and includes experiments in the areas of instrumentation, quantum physics and properties of matter. The course is based on mastery of the material, with marks awarded on completion of each experiment. Assessment is also based on reviews of the students' logbooks and writtenreportsonselected experiments.

Full details of course structure, content and assessment are provided in the handbook *Information for Students* available at the time of enrolment.

Textbooks
R. Eisberg and R. Resnick *Quantum Physics* (Wiley, 1985)
D.J. Griffiths *Introduction to Electrodynamics* (Prentice Hall, 1989)

Reference book
E. Hecht *Optics* (Addison-Wesley, 1987)

Physics 3 — 24 units

Dr Brand

Qualifying course Physics 2
Prereq Mathematics 2 (Pure, Applied or Combined)
Classes Yr: (4 lec, 6 prac & 2 microlab) / wk for part year; (5 lec & 7 prac)/wk for part year
Assessment (orie 2hr & one 3hr exam) /sem, prac, one 4000w . essay, assignments

The lecture course is divided into core topics, some of which may be taken with a theoretical or an applied emphasis and several options.

Full details of course structure, content and assessment are provided in the handbook *Information for Students* available at time of enrolment.

Core topics: Quantum Mechanics, Thermal Physics, Electromagnetic Waves

Options: include Energy Physics, Computational . Physics, Astrophysics, Plasma Physics, Modern Optics, Solid State Physics, Acoustics and Ultrasonics, Nuclear and Particle Physics. Not all options will be offered every year.

Textbooks
B.H. Bransden and C.J. Joachain *Introduction to Quantum Meclianics* (Longman, 1989)
R. Eisberg and R. Resnick *Quantum Physics* (Wiley, 1985)
D.J. Griffiths *Introduction to Electrodynamics* (Prentice-Hall, 1989)

Physics Honours, Physics 4

Dr James

Qualifying course Physics 3
Prereq Physics 3 and Mathematics 3 (Pure or Applied)
Classes Yr: 160 lec & research project
Assessment three 3hr and five 2hr exams, one 9000w report

Students of sufficient merit may be admitted to an honours course in fourth year. They must devote their whole time to work in connection with Physics. Physics honours comprises coursework (weight 50%) and a research project (weight 50%).

The courses of lectures and prescribed reading cover quantum mechanics, statistical mechanics, electromagnetic theory, solid state physics, plasma physics, modern optics, sub-atomic physics, relativistic quantum mechanics and mathematical methods. Some of these courses are optional. Additional optional courses, which may not be offered every year, include general relativity, materials physics, semiconductor devices, laser physics, cosmology, ionospheric physics, statistical optics, millimetre wave optics, ionising radiation and partially ionised gases.

Honours students are associated with one of the research groups in the School of Physics, and their research project is a part of the research activity of that group. Students are required to submit a formal report on their research work. Only students with a strong mathematical background are permitted to under take a wholly theoretical research project. A mathematical methods course is provided for such students.

Honours students are encouraged to participate along with staff and research students in all activities within the School. They are provided with office accommodation, and are expected to attend colloquia, seminars and meetings of the Physics Board. They may be employed for a few hours per week in first year teaching.

Postgraduate study

Details concerning fields of postgraduate study in the School of Physics may be obtained on applica Hon to the Convenor of the Physics Postgraduate Committee, School of Physics.

Department of Physiology

The Department of Physiology provides main courses for those wishing to major in physiology and an auxiliary course for others. Students reaching an acceptable standard may enrol for the honours year, MSc or PhD degrees.

It will be possible for BSc students who first enrolled in the degree before 1992 to enrol in Physiology 2, although the main course for study will be an Intermediate Physiology course in the BMedSc degree. The Physiology 2 Auxiliary course will remain available for all BSc students in and after 1992.

Location
The Department is in the Anderson Stuart Building opposite Fisher Library bookstack; the office is on the ground floor.

Noticeboards
Information on courses and examination results are placed on a noticeboard near the Manning Road entrance (north side).

Registration
All students (including repeat students and non-degree students) must complete a registration card (available in the office) during the orientation period or earlier. Consult the noticeboard to determine the procedure for arranging your laboratory class time.

Advice on courses
The office will direct you to an appropriate member of staff.

Information booklet
An information booklet and synopses of courses are available in the office.

Physiology 2 — 16 units

This course is not available to students who first enrolled in the BSc degree after 1991.

See 1994 Faculty of Science Handbook, p. 102 or consult Department for details of this course.

Physiology 2 Auxiliary — 8 units

Dr Frommer (course supervisor), Dr Hoh, Dr Mason, Dr Morris, Dr Martin
Prereq Nil
Classes Yr: (3 lec & 1 tut)/wk
Assessment one 2.5hr exam/sem

This is a general course dealing with the functions of the major human body systems: haematology-immunology, cell physiology, renal physiology, gastrointestinal physiology, respiration, cardio-vascular physiology, endocrinology, sensory systems, central nervous system. Tutorials cover discussion of lecture material, videos and short practical sessions, but there is no major practical component.

Textbook
R. Rhoades and R. Pflanzer *Human Physiology* (Saunders, 1992)

Physiology 3 — 24 units

This course is not available to students who first enrolled in the BSc degree after 1991.

See 1994 Faculty of Science Handbook, pp. 102-103 or consult Department for details of this course.

Physiology Honours

Assoc. Prof. Davey (course supervisor)

During fourth year, no formal course of lectures is provided but students are given a relevant problem to investigate. This problem usually represents a small facet of one of the major current research projects within the Department, and the students work in collaboration with members of the staff. Students write a thesis embodying the results of their work.

Department of Psychology

Psychology is the study of behaviour. As a study it is approached on a scientific basis, with provision for professional training at the postgraduate level. The research activities of the Department cover almost all of the main branches of the subject.

Registration and noticeboards
Students in all years must register during the orientation period. Psychology 1 students register by going to the Carslaw Building during orientation and collecting a personalised computer-generated timetable/which will indicate the lecture stream and the tutorial group to which they have been allocated. Further information will be posted at the Enrolment Centre and on the Psychology 1 noticeboard on the 4th Floor of the Griffith-Taylor Building.

Information about registration meetings for Psychology 2 and Psychology 3 students will also be posted at the Enrolment Centre, and on the departmental noticeboards on the 5th floor of the Griffith-Taylor Building.

Enquiries
The main enquiry office of the Department is Room 416, Griffith-Taylor Building (tel. 351 2872) where details may be obtained of the staff members available throughout the year to discuss particular courses.

Honours
In order to be eligible to graduate with honours in Psychology, it is necessary (except as provided in the by-laws or resolutions) to gain a pass.with at least credit in Psychology 2 and Psychology 3. Students wishing to graduate with honours in Psychology are urged to discuss their choice of other subjects with a Faculty adviser as soon as practicable. There is currently a quota on entry to Psychology 4.

Examinations
Undergraduate courses are examined at the end of each semester and include class work by way of essays, reports or practical/laboratory work. Atthe beginning of each course or section of a course, students are advised of its relative weight and the contributions of exam and classwork for assessment purposes.

Textbooks
Check departmental noticeboards before buying prescribed texts.

Psychology 1 — 12 units

Classes Yr: (3 lec & one 2hr tut)/wk
Assessment Sem 1: one 3hr exam, one 1000w essay, quiz; Sem 2: one 3hr exam, one 1500w prac report, quiz; Yr: 6hr of experimental participation

Registration with the Department should take place in the orientation period. Details will be posted on departmental noticeboards.

The course is a general introduction to the main topics and methods of psychology, and is the basis for advanced work as well as being of use to those not proceeding with the subject. The course covers the following areas: subject matter and methods of psychology; basic statistics and measurement; behavioural neurosdence; sensory processes; sodal psychology; personality theory; human development; human mental abilities; learning, motivation and abnormal psychology; visual perception; cognitive processes.

Textbooks
H.Gleitman *Psychology* (3rd edn) (Norton, 1991)
Handbook and Practical Worksheets for Psychology 1 (1994)

Psychology 2 — 16 units

Qualifying course Psychology 1
Classes Yr: (4 lec & up to 4hr tut/prac)/wk
Assessment two 2hr exam, essays, prac, reports/sem

Psychology 2 deals with material on both basic and complex psychological processes and covers the following topics:

Psychological statistics
Classes Yr: (1 lec & 1 tut)/wk
Assessment one 1hr exam, quiz/sem

Personality
Classes Sem 1: (1 lec & 1 tut)/wk
Assessment one 1hr exam, one 1500w essay

Individual Differences
Classes Sem 1: (1 lec & 1 tut)/wk
Assessment one 1hr exam

Behavioural Neurosdence
Classes Sem 1: (1 lec & 1 prac)/wk for 8 wks
Assessment one 40min exam

Perception
Classes Sem 1: (1 lec & 1 prac)/wk for 5 wks; Sem 2: (1 lec & 1 prac)/wk for 4 wks
Assessment one 20min exam/sem

Learning
Classes Sem 2: (1 lec & 1 prac)/wk for 9 wks
Assessment one 40min exam, prac report

Social Psychology
Classes Sem 2: (1 lec & 1 tut)/wk
Assessment one 1hr exam, one 1000w essay

Cognitive Processes
Classes Sem 2: (1 lec & 1 prac)/wk
Assessment one 1hr exam, one prac report

Textbooks
To be announced

Psychology 3 — 24 units

Qualifying course Psychology 2 or 2A
Classes Yr: (4 lec & up to 6hr of tut/prac)/wk
Assessment (two 3hr exams, two 1hr exams, essays, prac reports)/sem

Classes
The course consists of four lectures and up to six hours of practical-tutorial work each week. The classwork includes essays and reports of practical or laboratory work done under supervision.

Courses
Because of timetabling difficulties some courses are offered at times other than those listed for Psychology 3 in the timetable for Senior courses. The detailed arrangements for each semester are as follows:

Students wishing to proceed to Psychology Honours mustcomplete History and Philosophy of Psychology and the options in Measurement & Psychometrics and Statistics & Research Design, plus two options in each semester.

Students not wishing to proceed to Psychology honours must complete History and Philosophy of Psychology *plus* three options each semester.

Note: All Psychology options are offered subject to the availability of staff and on the condition that they are chosen by an adequate number of students in each case. The topics include:

Semester 1

Abnormal Psychology
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, one 1500w essay, tut paper

Cognitive Processes: Recognition, Search and Memory
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, prac reports

History and Philosophy of Psychology
(required of all students)
Classes Yr: (1 lec & 1 tut)/wk
Assessment one 1hr exam, tut paper

Intelligence
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, one prac report, tut paper

Learning and Motivation
Classes (1 lec & up to 2hr of tut or prac)/wk
Assessment one 1hr exam, prac report

Measurement and Psychometrics
(required of students wishing to proceed to" Psychology honours)
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, prac report

Social Psychology
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, prac report

Theoretical Bases of Development
Classes (1 lec & 1 tut)/wk
Assessment o'ne 1hr exam, one 1500w essay

Semester 2

Behavioural Neuroscience
Classes (1 lec & up to 2hr of prac or tut)/wk
Assessment one 1hr exam, prac report

Child Abnormal Psychology
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, one 1000w essay, tut paper

Developmental Issues
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, assignment

Environmental and Organisational Psychology
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, one prac report

History and Philosophy of Psychology
(required of all students)
Classes (1 lec & 1 tut)/wk
Assessment one 2hr exam, one 2500w essay, tut paper

Human Performance
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, prac report

Language and Communication
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, assignment

Perceptual Systems
Classes (1 lec & up to 2hr of tut or prac)/wk
Assessment one 1hr exam, prac report

Personality
Classes (1 lec & 1 tut)/wk
Assessment one 1hr exam, assignment

Statistics and Research Design
(required of students wishing to proceed to Psychology honours)
Classes (1 lec & 1 rut)/wk
Assessment one 1hr exam, prac report

The Nature/Nurture Controversy in Psychology
Classes (1 lec & l'tut)/wk
Assessment one 1hr exam, one 1500w essay, tut paper

Psychology Honours
Prereq credit or better in Psychology 2 and 3; specified options in Psychology 3
Assessment one 2hr & one 3hr exam or equivalent

Due to lack of resources, the intake to Psychology honours will be limited to approximately 50 students and will be determined by academic merit.

Students are required to (a) devise, conduct and report upon an empirical research project, (b) write a theoretical thesis, and (c) attend one lecture course and two seminar courses and, for nine weeks of first semester, two method courses. The areas of psychology in which these activities may occur depend on the interests and specialities of staff members.

Book lists will be supplied by staff handling the numerous special fields that are available.

Postgraduate study
MSc and PhD in Psychology
See the University's *Statutes and Regulations 1994-95.* for by-laws and resolutions. Direct enquiries to the Head of Department.

Master of Psychology
Postgraduate training in clinical psychology is controlled by the Faculty of Science. Details of the Master of Psychology degree awarded on successful completion of this training are available in the *Statutes and Regulations 1994-95* and Chapter 7 of this handbook.

Soil Science

See under **Department of Agricultural Chemistry and Soil Science.**

BSc/LLB

For an introductory statement on the Science/Law course, see Chapter 3.

Legal Institutions
Classes Yr: (3 lec & 2 tut)/wk

An introduction to law which explores the origin and development of law in Australia, and the institutions through which it is promulgated and administered today. Attention is given in this regard to the processes of government, parliamentary, executive and administrative, and the constitutional framework in which these operate. The court structure is also studied, along with the role of the judiciary in shaping the law. Major theories about the nature and purpose of law will be discussed, and students will be encouraged to evaluate critically the way in which legal institutions work.

The tutorial program is used for detailed consideration of the reading materials. The lecturer will post notices relating to the course on the Fisher Stack noticeboard.

Legal Research and Writing
This course is designed to develop students' capacity in legal research and writing. The course has two components: legal research (including instruction in computer assisted legal research) and legal writing. Each component must be completed for a pass grade to be obtained. The course is conducted on a pass/fail basis. Both components are integrated in law subjects taught in the first three years of the Combined degree.

Constitutional Law

Classes Yr: (2 lec & 1 tut)/wk

The aim of the course is to give students an understanding of State, and especially Federal, constitutional law. In the latter area, the aim is to give an overall appreciation, complemented by more detailed examination of selected topics.

The State content includes the Constitution Act 1902 (N.S.W.) generally, particular provisions (e.g. peace, welfare and good government, manner and form, territoriality, separation of powers), the Australia Acts 1986, the State Constitution as affected by, and as compared with, the Commonwealth Constitution.

The Federal content includes introductory material (e.g. Federation, characterisation, severance, outline of judicial review and interpretation), selected federal legislative powers, the judicial power and jurisdiction, prohibitions on power, inconsistency of laws, Commonwealth-State relations.

Torts

Classes one 1hr tut/fn & twolhr lec/wk

The law of torts is concerned with common law and statutory liability for non-contractual civil wrongs. This course is directed at providing students with a comprehensive understanding of the principles on which liability is based through detailed study of a number of tort actions including trespass, negligence and nuisance. In the tort actions selected for study, the course will examine the various forms of conduct and states of mind which may give rise to liability for damage, ranging from physical injury to person or property, to purely economic loss. Limitations on liability will be examined critically.

The course includes a study of the historical evolution of tort liability and a detailed analysis of causation and remoteness of damage, the assessment of damages, fatal accidents and other injuries to relational interests, concurrent and vicarious liability, the action for breach of statutory duty and liability for animals.

Criminal Law

Classes Yr: (2 lec & 1 tut)/fn

This course seeks to provide a knowledge and critical understanding of the criminal law, in the context of the Australian criminal justice system.

The subject-matter covered in the course is essentially as follows:

(a) Crime and the criminal justice system
(b) Offences against the person
(c) Offences against property
(d) General principles of criminal liability
(e) Criminal procedure
(f) Sentencing

The lecturers will post information relating to the course on the noticeboard in Fisher Stack.

Administrative Law

Classes Yr: *(2* lec & 1 tut)/wk

This course is concerned with the powers and procedures of administrative agencies, and the avenues for review of their decisions. Non-judicial avenues which are considered include the Commonwealth Ombudsman, the Federal Administrative Appeals Tribunal, freedom of information legisla tion and public consultation under rule-making procedures. The statutory and common law procedures for seeking judicial review are studied, together with the grounds of judicial review and remedies. Policy issues which arise throughout the course are considered by reference to political and legal theory, and are pursued in greater depth in the context of the tutorial component of the course and the research assignment.

Contracts

Classes Yr: (2 lec & 1 tut)/wk

Contract law provides the legal background for transactions involving the supply of goods and services and one means, arguably the most significant means, by which the ownership of property is transferred from one person to another. It vitally affects all membersofthecommunityandathoroughknowledge of contract law is essential to all practising lawyers. In the context of the law curriculum as a whole, Contracts provides background which is assumed knowledge in many other courses.

It necessarily follows from the above that the aims of the course are composite in nature. Perhaps the central aimis to provide an understanding of the basic principles of the common law and statutes applicable to contracts and to provide a grounding in one of the most important areas of law in practice. A second aim is for students to be given the means to evaluate, to make normative judgements, about the operation of the law. This leads to a further aim, admittedly fairly modest in scope, to make some examination of contract law in other countries. As Contracts is basically a case law subject, the final aim of the course is to provide experience in problem solving by application of the principles provided by the decided cases.

Successful completion of this course is a prerequisite to the option Advanced Contracts.

The lecturers will post information relating to the course on the Law noticeboard in the Carslaw Building.

Degree of Bachelor of Pharmacy

First Year

The following courses are as prescribed by the Senate resolutions in force from 1990.

Biology 1 for Pharmacy — 8 units

Biological Sciences staff

Ak HSC Chemistry (2-unit); HSC Biology (2-unit) or equivalent is also desirable

Classes Yr: (1 lec & 3 prac)/wk

Assessment (one 1.5hr exam & one prac exam) / sem, class work

This section is designed to integrate with Physiology 1 for Pharmacy. It comprises lectures and practical classes on cell structure and function, mammalian structure and function, development and genetics.

Many of the topics in the course are then studied in more detail in the Physiology course.

Textbook
E.N. Marieb *Human Anatomy and Physiology* 2nd edn (Benjamin/Cummings, 1992)

For further details obtain a copy of *Information for Students in First Year Biology* from the Pharmacy office.

Physiology 1 for Pharmacy 6 units

Dr Cottee (course coordinator) and Department of Physiology staff
Classes Yr: 3 lec/wk
Assessment Sem 1: one 1.5hr exam. Sem 2: one 2hr exam

This course is designed to provide a broad basic knowledge in areas such as nerve and muscle physiology, circulation, respiration, blood, endocrinology, reproduction, kidney, body fluid regulation and the function of the central nervous system.

Students who have not studied Biology for the HSC are advised to read a basic physiology book or the physiology section of a school biology text before the beginning of first semester.

Textbook
E.N. Marieb *Human Anatomy and Physiology* 2nd edn (Benjamin/Cummings, 1992)

Chemistry 1 for Pharmacy 16 units

The names of the lecturers giving the course will be available from the School of Chemistry during the orientation period
AKn HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the Mathematics 2-unit course
Classes Yr: (4 lec & 1 tut & 3 prac)/wk
Assessment Sem 1: one 3hr exam; Sem 2: one 2.5hr exam & one 2hr exam

Introduction, states and properties of matter, stoichiometry, chemical energetics, equilibrium theory, solution equilibrium, atomic structure, chemical bonding, general acid-base theory, electrochemistry, comparative chemistry of elements, introduction to organic chemistry, nomenclature, aliphatic chemistry, aromatic chemistry, isomerism, reaction mechanism.

Special preparative studies. Students wishing to enrol in Chemistry 1 for Pharmacy who have not taken the HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course are required to study either of the following books before the beginning of first semester:

R.J. Hunter *et al. Chemical Science* (Science Press, 1980)
A. Boden *Chemtext* (Science Press, 1986)

Textbooks
Students should obtain a booklist from the School of Chemistry during the orientation period

Mathematics 1 for Pharmacy 4 units

Dr Easdown
AKn HSC 2-unit Mathematics (Students without this assumed knowledge are advised to attend abridge course in February)
Classes Sem 1: (3 lec & 1 tut)/wk
Assessment one 3hr exam

Measurement of physical quantities, differentiation and integration (with emphasis on linear, exponential and logarithmic, polynomial and periodic functions), functions of more than one variable, differential equations.

Reference books
J.C. Arya and R.W. Lardner *Mathematics for the Biological Sciences* (Prentice-Hall, 1979)
L.J. Goldstein *et al. Calculus and its Applications* (Prentice Hall, 1980)
R.D. Gentry *Introduction to Calculus for the Biological and Health Sciences* (Addison-Wesley, 1978)

Introductory Pharmacy 1 8 units

Miss Sainsbury (coordinator)

This course is made up of two sections:

Pharmaceutical Science

Miss Sainsbury, Dr Gipps
AKn HSC physics section of the 3/4-unit Science course or 2-unit Physics (but see footnote to Table of Courses for Pharmacy in Chapter 3 above)
Classes Sem 2: (3 lec & 1 tut)/wk & 3hr of prac for 8 wks
Assessment details from Department

Dose forms and their uses including an introduction to biopharmacy and pharmacokinetics. Physicochemical principles and their application to properties of solutions and to the processes of diffusion and partition. Polymorphism and phase equilibria. Rheology. Drugs from plants, galenicals and volatile oils.

Practical. The course, of 24 hours' duration, will demonstrate principles involved in formulating, preparing and evaluating pharmaceutical dosage forms.

Textbook
A.N. Martin *Physical Pharmacy* (Lea & Febiger, 1993)

Reference books
H.C. Ansel *Introduction to Pharmaceutical Dose Forms* (Lea & Febiger, 1985)
A.T. Florence and D. Attwood *Physicochemical Principles of Pharmacy* (Macmillan, 1988)

Professional Pharmacy

Prof. S.I. Benrimoj (coordinator)
Classes 1hr/wk for 9 wks, four 3hr externship, two 1hr tut
Assessment assignment, one 1hr exam

This section introduces students to the Australian health care system and role of the pharmacist within the health care system. Pharmacists' relationships with other health care professionals are examined through lectures and externships in clinical settings. The role of the pharmacists in society including ethical responsibilities are outlined by representatives of pharmacy organisations.

Reference book
A.I. Wertheimer and M.C. Smith *Pharmacy Practice — Social and Behavioural Aspects* (Williams & Wilkins, 1989)

Biostatistics 1 for Pharmacy 3 units

MrVandeVen
Ctosses Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

The statistics course is given in the School of Mathematics and Statistics.

Descriptive statistics, elementary probability theory, sampling methods, statistical inference, correlation and regression, analysis of variance.

Reference books

B. Rosner *Fundamentals ofBiostatistics* (P.W.S. Kent, 1990)

J.E. Freund *Modern Elementary Statistics* (Prentice-Hall International, 1988)

Microbiology 1 for Pharmacy 3 units

MrsDalins

Classes Sem 2: (2 lec & one 2.5hr prac)/wk for 10 wks

Assessment one 2hr exam, prac

This course provides information on the biology of micro-organisms with particular reference to the importance of microorganisms in pharmaceutical sciences. Topics covered include: history and scope of microbiology, methodology, comparison of major groups of microorganisms in terms of structure, function and importance as well as selected aspects of applied microbiology (microbial pathogenicity and epidemiology, growth, death and control of micro-organisms including disinfection, preservation and spoilage).

Textbook

G.J. Tortora *et al. Microbiology. An Introduction* (Benjamin Cummings, 1992)

Second year

Physical Pharmacy 2 10 units

Dr Ramzan (coordinator)

Prereq Introductory Pharmacy 1, Chemistry 1 for Pharmacy

Classes Sem 1:3 lec/wk; Sem 2:2 lec/wk, prac (see below)

Assessment Sem 1: one 3hr exam; Sem 2: one 2hr exam, classwork

Lecture topics Macromolecular dispersions; surface and interfacial tension, surface active materials, solubilisation; complexation, chemical kinetics, drug stability; diffusion theory, dissolution models; drug-plastics interaction, controlled release; solid pharmaceuticals and particle science; liquid formulations, water, cosolvents, oils and fats; suspensions, emulsions and semi-solids; origin and properties of pharmaceutical materials.

Practical work. The practical component of this course forms part of the Integrated Laboratory Segment described below.

Textbook

A.N. Martin *Physical Pharmacy* (Lea & Febiger, 1993)

Reference books

M.E. Aulton (ed.) *Pharmaceutics: The Science of Dosage Form Design* (Churchill Livingstone, 1988)

G.S. Banker and C.T. Rhodes (eds) *Modern Pharmaceutics* (Marcel Dekker, 1990)

K. A. Connors *etal. Chemical Stability of Pharmaceuticals* (Wiley-Interscience, 1979)

A.T. Florence and D. Attwood *Physicochemical Principles of Pharmacy* (Macmillan, 1988)

A.R. Gennaro *(ed.) Remington's Pharmaceutical Sciences* (Mack, 1985)

L. Lachman *etal. The Theory and Practice of Indus trial Pharmacy* (Lea & Febiger, 1986)

Pharmaceutical Analysis 2 8 units

Dr Duke (coordinator)

Prereq Chemistry 1 for Pharmacy

Classes Sem 1:2 lec/wk, prac (see below)

Assessment Sem 1: one 2hr exam, classwork

Lecture topics. Quantitative analysis; absorption spectrophotometry, UV, visible, fluorescence; gas and liquid chromatography; electrophoresis; electrochemical methods. Qualitative analysis, the determination of chemical structure using instrumental methods; nuclear magnetic resonance and mass spectrometry.

Practical work. The practical component of this course forms part of the Integrated Laboratory Segment described below.

Reference books

K.A. Connors *A Textbook of Pharmaceutical Analysis* (Wiley, 1982)

J.W. Munson *Pharmaceutical Analysis - Modern Methods* (Marcel Dekker, 1981)

R.L. Pecsok *etal. Modern Methods ofChemical Analysis* (Wiley, 1976)

T.W.G. Solomons *Organic Chemistry* (Wiley, 1992)

Integrated Laboratory Segment

Dr Duke (coordinator)

Classes Yr: 5hr of prac/wk

Assessment classwork

This is an integrated laboratory/tutorial program supporting both Physical Pharmacy 2 and Pharmaceutical Analysis 2 and also to some extent Medicinal Chemistry 2. Topics include: quantitative analysis using titrimetric, chromatographic and specrrophotometric methods; diffusional models for drug transport; stability of drugs; the determination of chemical structure by instrumental methods; dissolution and release of drugs from dose forms; physical properties of solid, semi-solid and liquid dose-forms.

Reference books

R.L. Pecsok *et al. Modern Methods ofChemical Analysis* (Wiley 1976)

A.N. Martin *Physical Pharmacy* (Lea & Febiger, 1993)

A.I. Vogel *Quantitative Inorganic Analysis* (Longmans, 1978)

Medicinal Chemistry 2 4 units

Assoc. Prof. Holder (coordinator)

Prereq Chemistry 1 for Pharmacy, Introductory Pharmacy 1

Coreq Biochemistry 2 for Pharmacy, Pharmacology 2 for Pharmacy

Classes 2 lec/wk

Assessment one 3hr exam/sem, classwork

Lecture topics Physiochemical properties and biological activity; partition coefficients and non-specifically acting drugs; surface activity and drug action. Drug metabolism; bioactivation and inactivation. Structural features and pharmacological activity; stereochemical aspects; chirality of drugs; conformation. Macromolecular targets for drug action; bonding and biological activity; drug-receptor interactions and receptor-effector theories. Enzymes as targets of drug action; enzyme catalysis and receptor kinetics. Receptors as targets of drug action.

Textbook

T. Nogrady *Medicinal Chemistry — a Biochemical Approach* (Oxford U.P., 1988)

Reference books
A. Albert *Selective Toxicity* (Methuen, 1985)
A. Burger *Medicinal Chemistry* (Interscience, 1980)
W.O. Foye *Principles of Medicinal Chemistry* (Lea & Febiger, 1989)
W. Pratt *et al.* (eds) *Principles of Drug Action — the Basis of Pharmacology* (Churchill/Livingstone, 1990)

Dispensing Practice 2 — 4 units

Miss Sainsbury (coordinator)
Prereq Introductory Pharmacy 1
Cbreq Physical Pharmacy 2
Classes Sem 1:5hr prac/wk for 6 wks; Sem 2:5hr prac for 4 wks
Assessment one prac exam /sem, class work

This course is a practical/tutorial course which deals with the extemporaneous preparationof dosage forms.

Textbooks
Australian Pharmaceutical Formulary 15 (Pharmaceutical Society of Australia, 1992)
Extra Pharmacopoeia: Martindale (Pharmaceutical Press, 1993) (This is the 30th edition; the 27th, 28th or 29th editions are also acceptable)

Reference books
British Pharmacopoeia (Pharmaceutical Press, 1993)
Pharmaceutical Handbook 19th edn (Pharmaceutical Press, 1980)
D.M. Collett and M.E Aulton (eds) *Pharmaceutical Practice* (Churchill Livingstone, 1990)

Pharmaceutical Microbiology 2 — 4 units

Dr Gipps (coordinator)
Prereq Introductory Pharmacy 1, Microbiology 1 for Pharmacy
Classes Sem 1:1 lec/wk, 1 tut/fn, 5hr of prac/wk for 6 wks
Assessment Sem 1: one 1.5hr exam, classwork

Lecture topics. Sterilisation methods and dynamics; disinfection and preservation; production of sterile, aseptic and preserved pharmaceuticals; official standards and testing; contamination control; quality control and assurance; rational use of sterile, aseptic and preserved pharmaceutical and medical products.

The practical course consists of a series of exercises conducted over six sessions to illustrate the principles covered in lectures.

Reference books
M.E. Aulton (ed.) *Pharmaceutics. The Science of Dosage Form Design* (Churchill Livingstone, 1988)
W.B. Hugo and A.D. Russell *Pharmaceutical Microbiology* (Blackwell, 1992)

Pharmacy Practice 2 — 8 units

Prof Benrimoj (coordinator)
Prereq Introductory Pharmacy 1, Physiology 1 for Pharmacy
Coreq Pharmacology 2 for Pharmacy, Pharmaceutical Microbiology 2, Medicinal Chemistry 2
Assessment Sem 1: one 1.5hr exam; Sem 2: one 1.5hr exam, case study continuous assessment

Psychology

Assoc. Prof. H. Beh (coordinator)
Classes Sem 1:1 lec/wk

This section introduces students to aspects of psychology necessary for a profession concerned with people. The theory of communication will be covered including issues such as verbal and non-verbal cues. Topics include the role of health andillnessinaperson and factors affecting compliance to medical regimens.

Pharmacy Communication

Classes Sem 1:1 lec/wk

The theory of communication will be applied to specific pharmacy situations such as pharmacist/patient and pharmacist/doctor interactions. Issues relating to the provision of disease and medication information to consumers, patients and other health professionals will be covered. Aspects of communication relevant to the practice environmentincluding hospital, nursing homes and community pharmacy will be studied.

Textbook
W.N. Tindall *et al. Communication Skills in Pharmacy Practice* (Lea & Febiger, 1989)

Therapeutics

Classes Sem 2: (2 lec & one 1hr tut & 3hr of externship)/wk

Lecture topics: drug information, adverse drug reactions, drug interactions, epidemiology, pathophysiology, symptoms, signs, management — drug and non drug treatment of diseases of the endocrine system, central nervous system, cardiovascular system, renal system and psychiatry. Actual applications of drug knowledge gained in other parts of the course will be emphasised with priority given to the delivery of drug and disease state information to patients and other health professionals. The lectures will emphasise the role of the pharmacists in the community and hospital settings. The externship will attempt to integrate lecture material with practice. Clinical case studies will be discussed in tutorials.

Textbooks
E.T. Herfindal *et al. Clinical Pharmacy and Therapeutics* (Williams & Wilkins, Baltimore, 1989)
USP DI *Drug Information for the Health Care Professional 1992* • 12th edn (United States Pharmacopeial Convention Inc.)
Facts and Comparison Drug Interactions (Lippincott, U.S.A., 1990)

Reference books
Prescription Products Guide 1993 vols 1 & 2 (Australian Pharmacy Publications Co.)
The Merck Manual of Diagnosis and Therapy 15th edn (Merck Sharp & Dohme Research Industries, 1987)

Biochemistry 2 for Pharmacy — 6 units

Dr Darvey, Dr Conigrave, Dr Denyer, Dr King
Prereq Chemistry 1 for Pharmacy
Classes Yr: 3 lec/wk
Assessment one 3hr exam/sem

This course in Biochemistry and Molecular Biology is designed to provide a firm basis in the chemistry of life. Questions to be addressed include: What are the chemical structures of the components of living matter? How do their interactions lead to the assembly of organised macromolecules, cells, and multicellular tissues and organisms? How does living matter 'extract' energy from its environment? How are chemical reactions controlled inside living cells? How does an organism store and decipher the information it needs to grow and reproduce?

Specifically, the course will cover the following topics: structures of biological macromolecules (proteins, nucleic acids, and sugars);molecular morphology of cells; genetic engineering and the genetic code — storage, utilisation, and control of genetic information (DNA); digestion, storage, and utilisation of dietary carbohydrate, lipid and protein; biological catalysts (enzymes); generation of metabolic energy; metabolic adaptation during starvation, exercise, and diabetes; inherited disorders of metabolism; pharmaceutical intervention in metabolic pathways.

Textbooks
To be advised

Pharmacology 2 for Pharmacy 4 units

Assoc. Prof. Starmer, Assoc. Prof. Mylecharane (coordinators)
Prereq Chemistry 1 for Pharmacy, Physiology 1 for Pharmacy
Coreq Biochemistry 2 for Pharmacy/Pharmacy Practice 2
Classes Yr: 2 lec/wk
Assessment one 1.5hr exam/sem

Principles of drug action and receptor pharmacology. Neuropharmacology: peripheral and central neurotransmission, and drugs affecting these systems. Autacoids. Endocrine pharmacology. Cardiovascular and renal drugs. Chemotherapy principles.

Textbook
H.P. Rang and M.M. Dale *Pharmacology* (Churchill Livingstone, 1991)

Study aids
M.M. Dale and A.H. Dickenson *Companion to Pharmacology* (Churchill Livingstone, 1993)
R. *EmsteinPharmacology. Self-assessment Questions for Students* (Butterworths, 1989)
M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books
J.R. Cooper *et al. The Biochemical Basis of Neuropharmacology* (Oxford, 1991)
A.G. Gilman *et al.* (eds) *Goodman and Gilman's The Pharmacological Basis of Therapeutics* (Pergamon, 1990)
B.G. Katzung (ed.) *Basic and Clinical Pharmacology* (Appleton & Lange, 1992)

Third year

Students are required to complete a total of 50 units, of which 42 are from required or core courses. The remaining eight units are made up by the selection of one of the four elective courses offered.

Core courses

Pharmacokinetics 3 4 units

Dr Cutler (coordinator)
Prereq Physical Pharmacy 2
Classes Sem 1: (4 lec or tut)/wk
Assessment Sem 1:3hr exam

Fundamental concepts of pharmacokinetics; mass balance principle; elimination, extraction ratio, clearance, bioavailability, calculation of infusion rates, first pass effect; volume of distribution; i.v. bolus kinetics, duration and intensity of drug action; kinetics following extravascular doses; metabolite kinetics; renal excretion; hepatic elimination; tissue distribution; plasma protein binding; calculation of multiple dose regimens, clearance method, half-life method; pharmacodynamics, variability in pharmacokinetics and pharmacodynamics, pharmacokinetics and biopharmaceutics of selected drug classes including antibiotics, cardiovascular agents, analgesics, brorichodilators, anticonvulsants and anticoagulants.

Reference books
M.GibaldiBiopharmaceuticsandClinicalPharmacokinetics4th edn (Lea and Febiger, 1990)
S.B. HIadky *Pharmacokinetics* (Manchester University Press, 1990)
M. Rowland and T.N. Tozer *Clinical Pharmacokinetics* 2nd edn (Lea & Febiger, 1989)

Formulation 3 4 units

Dr Kennedy (coordinator)
Prereq Physical Pharmacy 2
Classes Sem 1:3-4 lec/wk, 5hr of prac/wk for 2 wks
Assessment Sem 1:3hr exam, classwork

Biopharmaceutical reasons for different formula tions; dosage form and drug transport; metabolism and elimination as related to routes of administration, local vs. systemic delivery; rate control of drug input; parenteral, rectal, dermal, transdermal, ophthalmic, aerosols, capsules and tablets; radiopharmaceuticals and their use in diagnosis and therapy; photobiology, phototherapy and sunscreens; chemical stability of finished dose forms; *in vivo* and *in vitro* correlations in drug and formulation design; use of *in vitro* tests and models in research and development in quality control and in relation to of official tests; advanced drug delivery, targeting and controlled release; formulation of vaccines and other biologicals.

Textbooks
As recommended for Introductory Pharmacy 1, Dispensing Practice 2 and Physical Pharmacy 2

Reference books
M.E. Aulton (ed.) *Pharmaceutics: The Science of Dosage Form Design* (Churchill Livingstone, 1988)
L. Lachman *et al. Theory and Practice of Industrial Pharmacy* (Lea & Febiger, 1986)
A.R. Gennaro (ed.) *Remington's Pharmaceutical Sciences* (Mack, 1985)
M. Rowland and T.N. Tozer *Clinical Pharmacokinetics* (Lea & Febiger, 1980)
K.C. Smith (ed.) *The Science of Photobiology* (Plenum, 1989)

Medicinal Chemistry 3 4 units

Dr Cheung (coordinator)
Prereq Biochemistry 2 for Pharmacy
Coreq Pharmacology 3 for Pharmacy
Classes Sem 1:3 lec/wk, 5hr of prac/wk for 6 wks
Assessment Sem 1: two 2hr exam, classwork

Lecfwreio/ncs Quantitativestructure/activityrelationships, computer-aided drugdesign; cholesterol; steroid hormones and drugs; metabolic antagonism; antibiotics; parasite chemotherapy; antifungals; antivirals; cancer chemotherapy; therapeutic products from biotechnology.

Practical work Development of a drug profile based on the requirements of the Therapeutic Goods Administration.

Textbooks
As recommended for Medicinal Chemistry 2
W.O. Foye *Principles of Medicinal Chemistry* (Lea & Febiger, 1989)

Reference books
A Albert *Selective Toxicity* (Methuen, 1985)
A. Burger *Medicinal Chemistry* (Interscience, 1980)
W. Pratt *et al.* (eds) *Principles or Drug Action - the Basis of Pharmacology* (Churchill Livingstone, 1990)

Pharmacy Practice 3 — 18 units

Prof. Benrimoj (coordinator)
Coreq Medicinal Chemistry 3, Pharmacokinetics 3 Pharmacology 3 for Pharmacy
Classes (2 or 5 lec, one 2hr tut & one 3hr externship (community))/wk, 1 wk of externship (hospital)
Assessment Sem 1: one 1.5hr exam (clinical), viva 3/4hr, externship (case studies); Sem 2:2hr exam (clinical), viva 3/4hr, 1hr exam (admin.), 1hr externship (case studies)

Textbooks
As for Pharmacy Practice 2 (Therapeutics section)

Therapeutics

Dr Armour (Sem 1), Prof. Benrimoj (Sem 2) (coordinators)
Classes Sem 1: (2 lec, one 2hr tut & one 3hr externship)/wk; Sem 2: (3 lec, one 3hr tut & one 3hr externship)/wk

This sectionis a continuation of the therapeutics section of Pharmacy Practice 2. Topics covered infirst semester include epidemiology, pathophysiology, symptoms, signs, management — drug and non-drug treatment of diseases associated with the respiratory tract, cardiology and rheumatology. In second semester the topics will include endocrinology, obstetrics and gynaecology, dermatology, oncology, genito-urinary tract, ear/eye, hepatic, pain, paediatrics, geriatrics and renal.

Immunology and Biotechnological Products

Prof. Benrimoj (coordinator)
Classes Sem 2:1 lec/wk

This section will cover immunological aspects of drug therapy. The basic reactions of the immune system to foreign materials will be addressed. In addition new therapeutic agents arising from the biotechnological revolution *will* be covered.

Externship

Mr Chen

The externship will integrate lecture material with practice. Students will complete case studies and report back to tutorials. Problem solving skills will be enhanced.

Tutorial

The tutorials will employ problem-based learning techniques. Computer patient medication review systems will be analysed. A number of computerised drug information data bases will be used. Role plays will be used to develop students' communication skills in pharmacist/patient and pharmacist/doctor interactions. Familiarisation with microcomputer software written specifically for pharmacists will take place. A joint practical with Pharmacology will be provided.

Pharmacy Administration

Prof. Benrimoj (coordinator)
Classes Sem 2:1 lec/wk

This section includes ethics and principles of management, with topics on business structures, accounting and law being discussed. Pharmacy administration relating to hospitals and to government agencies will be presented also.

Dispensing Practice 3 — 4 units

Prof Brown (coordinator)
Coreq Formulation 3
Classes Sem 1:1 lec/wk for 6 wks, one 3hr prac/ wk for 8 wks; Sem 2: one 3hr prac/wk for 8 wks
Assessment Sem 1: one 1.5hr exam (forensic pharmacy), classwork; Sem 2: prac exam, classwork

The six lectures will deal with forensic pharmacy.

The two series of eight 3-hour practical sessions will be devoted to the formulation aspects and the pharmacy practice aspects of dispensing respectively.

Textbooks and reference books
As recommended for Dispensing Practice 2

Pharmacology 3 for Pharmacy — 8 units

Assoc. Prof. Starmer, Assoc. Prof. Mylecharane (coordinators)
Prereq Biochemistry 2 for Pharmacy
Coreq Pharmacy Practice 3
Classes Sem 1:2 lec/wk & nine 6hr prac; Sem 2:2 lec/wk
Assessment Sem 1: one 1.5hr exam, classwork; Sem 2: one 1.5hr exam

Chemotherapy: antibacterial, antiviral, antifungal, antiprotozoal, anthelmintic and anticancer drugs. Immunosuppressants. Respiratory and gastro-intestinal pharmacology. Anti-inflammatory agents and analgesics. Vitamins and drugs affecting nutritional and metabolic function. Drugs affecting blood. Local and general anaesthetics. Drugs used to treat central nervous system disorders. Clinical toxicology and the introduction of new drugs. Drug abuse. The practical course reinforces and illustrates the theory underlying the actions of drugs.

Textbooks, study aids and reference books
As recommended for Pharmacology 2 for Pharmacy

Elective courses

Experimental Pharmacology 3 — 8 units

Assoc. Prof. Mylecharane, Assoc. Prof. Starmer (coordinators)
Coreq Pharmacology 3 for Pharmacy, Medicinal Chemistry 3
Classes Sem 2: 2 seminar/wk, 6hr prac/wk for 9 wks, 6hr research assignment/wk for 5 wks
Assessment Sem 2: one 2hr exam (seminar), one 1hr exam (prac), classwork and reports

The seminar sessions will comprise discussions and

presentations by students, under the guidance of staff, on the contribution of experimental pharmacological evaluation to the development of a series of selected drug classes, and the role of particular experimental methodologies in screening and evaluation of drug activity. The practical laboratory classes will provide training in general experimental pharmacological techniques, to evaluate the actions of drugs whose activity is well established. The research assignment will involve observation and discussion of the various research techniques currentlyinuse in the Department, plus allocation to a particular research group for more detailed observation and participation, together with completion of written reports.

Textbooks and reference books

As recommended for Pharmacology 3 for Pharmacy. Students will be required to refer to an extensive range of journals and monographs available in the University's libraries

Toxicology 3 — 8 units

Assoc. Prof. Holder (coordinator)

Coreq Medicinal Chemistry 3

Classes Sem 2:3 lec/wk ltut/wk & 5hr of prac/wk for 8 wks or an essay

Assessment Sem 2:3hr exam, classwork (including an essay if this is the option chosen)

Theory The lecture course consists of three sections:

General toxicity testing (12 lectures)

Design and interpretation of toxicity tests; toxicity in the community and the regulation of toxic substances. Measurement of acute, subacute and chronic toxicity. Carcinogenicity, teratogenicity and mutagenicity; short-term tests for the prediction of carcinogenicity. Inhalation toxicity; eye irritancy; dermal toxicity; ototoxicity.

Biochemical mechanisms of toxicity (12 lectures)

Factors affecting toxicity and the mode of action of toxic chemicals. Metabolic and pharmacokinetic factors in the balance between intoxification and detoxification processes; genetic factors; induction and inhibition of metabolism. Mutagens, teratogens and carcinogens; furosemide and paracetamol; oxygen.

Toxicological applications in analytical **chemistry** (12 lectures)

Chemical analysis in relation to governmental regulations. Sensitivity, selectivity, accuracy and precision of basic analytical techniques. Separation and identification of metabolites; selective detection in liquid chromatography. Forensic applications; newer techniques in gas chromatography and mass spectrometry. Environmental analysis; pesticides and herbicides by electron capture; atomic absorption and x-ray fluorescence; immunological techniques.

Practical work Eight 5-hour sessions designed to illustrate some of the areas listed above.

Reference books

A. W. Hayes (ed.) *Principles and Methods of Toxicology* (Raven Press, 1989)

A. Kaplan, L.L. Szabo and K.E. Opheim *Clinical Chemistry: Interpretation and Techniques* (Lea & Febiger, 1988)

C.D. Klaasen, J. Doull and M.O. Amdur (eds) *Casarett and Doull's 'Toxicology-the Basic Science of Poisons'* (Pergamon, 1991)

Industrial Pharmacy 3 — 8 units

Prof. Brown (coordinator)

Coreq Pharmacokinetics 3, Formulation 3

Classes 41ec/wk, ltut/fn, 2 wk fieldwork

Assessment one 3hr exam (Sem 2), essay report on prac

Theory The course consists of the following sections:

Registration of therapeutic substances in Australia (9 lectures)

Introduction to the registration of new drugs and formulations with the Commonwealth Department of Health; NDF5 applications for general marketing and clinical investigational use of drugs; evaluation of NDF5 submissions; data bases on chemistry, pharmacology and clinical use of drugs.

Clinical research trials (4 lectures)

Clinical notification and exemption schemes: requirements of institutional ethics committees. Design of clinical trials and clinical trial protocols. Requirements for good clinical research practice. Monitoring trials.

Pharmacoeconomics (4 lectures)

Economic aspects of pharmaceuticals: international and Australian perspectives. Principles of health economics, cost benefit analysis, design and analysis of trials to demonstrate benefit versus cost. Case histories and worked examples.

Industrial **Management** (eleven 1 hr lec/workshop sessions)

Company and industry structure. Communication skills. Operation management. Market concepts. Personnel management and industrial relations. Financial management.

Students are also required to take both a 12-lecture series entitled Toxicological applications in analytical chemistry' as described under the course Toxicology 3' and the lecture and seminar component of the section entitled 'Formulation and dosage form design', as described under the course Biopharmaceutics 3.

Practical experience Students spend a ten-day period working in a pharmaceutical company, and will be required to take this segment of the course during either the June/July or September/October vacation. The first week is devoted to obtaining a perception of the general structure and operation of the company and of the various departments within it. The second week is devoted to specific work selected by consultation between the student, the Department and members of the company.

Biopharmaceutics 3 — 8 units

Dr Ramzan (coordinator)

Coreq Formulation 3, Pharmacokinetics 3, Dispensing Practice 3

The course consists of the following sections of which students are required to take any two of the following three segments:

Applied Biopharmaceutics and Pharmacokinetics

DrRamzan
Classes Sem 2: 20 lec, 34hrs of prac/seminars
Assessment Sem 2: 2hr exam

Theory: Eighteen lectures on topics related to the acquisition of biopharmaceutical data. Dissolution testing and evaluation of methodology; blood concentration monitoring; computer-based analysis of pharmacokinetic data; bioavailability; assessment and design of trials.

Practical: (34 hours) A series of experiments and laboratory exercises to illustrate the concepts discussed in the theory course.

Dosage-form design

Dr Gipps, Dr Kennedy
Classes Sem 2:12 lec, 6 seminars, 5hr prac/wk for 6 wks
Assessment classwork and presentation of results

Specific examples and problems of dosage-form design. Students are assigned a practical project illustrating one of the aspects dealt with in lectures and seminars.

Computer programming

Dr Cutler
Classes Sem 2: 6hr of prac for 9 wks
Assessment classwork and 1hr exam

This course is given in a tutorial/practical format and occupies nine 6-hour sessions. It deals with programming in FORTRAN language and emphasises the use of computers in scientific calculations.

Honours degree

The Bachelor of Pharmacy Honours degreeis governed by regulations of the Senate and of the Faculty of Science that are parallel with those of the Bachelor of Science Honours degree as set out and explained in this handbook. Sections 9-11 of the Senate resolutions for BPharm are analogous to 15-17 of those for the BSc.

Within the *Department of Pharmacy* the honours degree may be taken in one of the three subjects Pharmaceutical Chemistry, Pharmaceutics or Pharmacy Practice. In each case the fourth year program comprises:

(i) one or two projects in which the student investigates a problem and presents oral and written accounts of his/her work,
(ii) a variety of coursework some parts of which are compulsory and others are chosen from a number offered within the Department and by other departments,
(iii) participation in a number of seminar discussions within the Department.

The degree is awarded on the basis of a mixture of continuous assessment — including an evaluation of essays and reports of projects — and the results of examinations, as well as on academic performance in the earlier years of the undergraduate course.

Students who are considering the honours course are encouraged to consult widely with members of the academic staff during their Senior year. Further information, in the form of course outlines, is available from the Department

Suitably qualified graduates in Pharmacy for the University of Sydney may apply to be accepted into the honours program.

In the *Department of Pharmacology* honours students are given a project designed to provide training in the fundamentals of pharmacological research. A literature review and a written report on the research project must be prepared. Seminars on the literature review, the project and another chosen topic will be given by the student. An honours degree is awarded considering the following:

(i) marks awarded for the literature review and the seminars
(ii) marks awarded for the project thesis
(iii) level of passes gained in the second and third year examinations

Degree of Bachelor of Medical Science

The following courses are as prescribed by the Senate resolutions in force from 1992.

First Year

Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)

Chemistry 1 or Chemistry 1 (Advanced)

Physics 1 or Physics 1 (Advanced)

Biology 1 or Biology 1 (Advanced)

These courses are all current first year courses in the BSc degree. Students must complete these with a full pass or better to be eligible for entry into the BMedSc degree, which commences at the beginning of second year. Students who have completed Computer Science 1 or Computer Science 1 (Advanced) or Psychology 1, and not Biology 1 or Biology 1 (Advanced), may be granted permission to enrolin the degree. Applications for admission to the degree course should be submitted to the Universities Admission Centre no later than 30 September of the year prior to entry into the degree.

Second Year

Human Life Sciences 2 **28 units**

Dr Dampney (course coordinator) and staff from the Departments of Anatomy & Histology, Physiology and Pathology
Classes (5 lec & 2 tut & 7 prac)/wk
Assessment written & prac exams, essays, prac reports

This course is a broadly based integrated course on the structure and function of the human body, taught by the Departments of Anatomy & Histology, Pathology and Physiology. Examples will be given, at an elementary level, of the pathology of particular tissues and organ systems. The response of the body to environmental stress will also be discussed. The following topics will be taught, under three broad headings:

Being Alive Introduction to basic cell types and tissues, and to the organisation of the nervous system. Structure

and functions of bones and joints. Musculoskeletal structure of the trunk, withreference to breathing and movement Motor systems. Structure and function of the autonomic nervous system, and of the sensory systems. Central nervous system processing of information. Basic cellular mechanisms of signal transduction, nerve impulse conduction and muscle contraction.

Maintaining Life Principles of homeostasis at systemic and cellular levels. Structure and function of blood. Cell injury and adaptation. Inflammation, wound healing and repair. Structure and function of: heart and circulation, including haemodynamic derangements; respiratory, urinary, digestive and endocrine systems. Basic cellular mechanisms of membrane transport, secretion and hormone action. Neoplasia. Effects of environmental stresses on body function.

Creating Life Structure and function of reproductive organs. Elementary physiology of the embryo and foetus.

Pharmacology 2 (Introductory) 8 units

Dr Allan
Classes 2 lec/wk & nine 6hr prac/yr
Assessment one 2hr exam/sem, classwork

Sites at which drugs act. Receptors and basic mechanisms of drug action. Binding-effect relationships. Drug absorption, distribution and metabolism. Relationships between drug activity and chemical structure. Effect of drugs on the autonomic nervous system. Drugs used for pain and inflammation. Basic factors in toxicology. Social use of drugs.

Textbook
H.P. Rang and M.M. Dale *Pharmacology* 2nd edn (Churchill Livingstone, 1991)

Study aids
R. 'Einstein *Pharmacology. Self-Assessment Questions for Students* 2nd edn (Butterworths, 1989)
M.J. Neal Medical *Pharmacology ataGlancelnd* edn(Blackwell Scientific Publications, 1992)

Reference book
A.G. Gilman *el al. Goodman and Gilman's The Pharmacological Basis of Therapeutics* 8th edn (Pergamon Press, 1990)

Biochemistry 2 (Medical Science) Auxiliary 8 units

Dr Denyer, Dr Conigrave, Dr Darvey, Dr King
Qualifying course Chemistry 1 or Chemistry 1 (Advanced)
Classes 3 lec/wk
Assessment one 3hr exam/sem

This lecture course in Biochemistry and Molecular Biology is designed to provide a solid basis in the chemistry of life. Questions to be addressed include: What are the chemical structures of the components of living matter? How do their interactions lead to the assembly of organised macromolecules, cells and multicellular tissues and organisms? How does living matter extract energy from its environment? How are chemical reactions controlled inside living cells? How does an organism store and decipher the information it needs to grow and reproduce?

Specifically, the course will cover the following topics: structures of biological macromolecules (proteins, nucleic acids, lipids and sugars); molecular morphology of cells; the structure and function of genetic information (DNA and RNA); the replication of DNA; protein synthesis and the genetic code; the regulation of gene expression in prokaryotes and eukaryotes; recombinant DNA technology and genetic engineering; digestion, storage and utilisation of dietary carbohydrate, lipid and protein; biological catalysts (enzymes); generation of metabolic energy; metabolic adaptation during starvation, exercise and diabetes; clinical intervention in metabolic disorders.

Textbooks
To be advised

Biochemistry 2 (Medical Science) Practical 8 units

Mrs Loke
Classes one 5hr prac/wk
Assessment one 2hr prac exam/sem, practical reports

This augments the Biochemistry 2 (Medical Science) Auxiliary course by providing practical laboratory experience to students interested in developing medically applied biochemical skills. Practical classes include training in biochemical procedures similar to those used in medical laboratories and the biotechnology and pharmaceutical industries.

Biology 2 (Molecular and General Genetics) Auxiliary 8 units

Biological Sciences staff
Classes Sem 1: (3 lec & 1 tut & 4 prac)/wk
Assessment one 3hr exam, one 2hr theory of practical exam, assignments, practicals

An introduction to the many facets of prokaryotic and eukaryotic genetics and the crucial role that molecular biology plays in our current understanding of the biological world. Topics will include the structure and function of DNA and RNA, the structure, replication and transmission of chromosomes, mechanisms of gene regulation and transfer in prokaryotes, eukaryotic gene regulation, human molecular genetics, recombinant DNA and genetic engineering, and population and evolutionary genetics. Laboratory classes will provide training in techniques employed in the study of genetics and molecular biology.

History and Philosophy of Science 2 Introductory 8 units

Assoc. Prof. Chalmers Dr Shortland Dr Rasmussen
Classes (2 lec & 2 tut)/wk
Assessment (3 tut assignments & one take-home exam)/sem

This course is the same course as currently offered for the Bachelor of Science degree.

Third year

Microbiology and Immunology 3 10 units

Prof. Reeves, Dr Britton
Classes Sem 1: (4 lec & 6 prac)/wk
Assessment one 3hr exam, practical

This core course is taught by the Department of Microbiology with a contribution from the Centenary Institute of Cancer Medicine and Cell Biology. It is designed to provide a basic understanding of (i) microorganisms and their role in human biology, and (ii) introductory immunology.

Topics
Introduction to techniques. Comparative structure and function of microorganisms. Principles and practice of taxonomy and identification of bacteria. Survey of major groups of medically important bacteria. Strategies of pathogenic organisms; host defence mechanisms; common modes of transmission; epidemiology. Immunology: functioning of the immune system, basic immunological techniques. Virology: structure of viruses, mechanisms of replication, viruses interactions.

Human Life Sciences 3 (Cellular and Molecular) 4 units

Assoc. Prof. Cook (course supervisor)
Classes Sem 1: (1-2 lec & 2 tut)/wk
Assessment tut assessment & 5 topic reports & 1 assignment

In this course students will investigate five topics drawn from the most active areas of research in cellular physiology and biology. The intention of the course is to teach students some of the basic principles of cellular function while giving them experience in extracting information from the scientific literature, summarising it and drawing conclusions fromit. Emphasis is placed on the oral and written presentation by students *pi* the results of their work. The course makes extensive use of small-group teaching methods and problem-based learning with the lectures providing background information on the concepts and techniques dealt with in the small-group sessions. Assessment is based on (i) performance in the small-group sessions, (ii) 5 reports, one in each of the topics studied in the small-group sessions, and (iii) an assignment on a subject related to the broad area of the course.

The topics covered are as follows.

Membrane transport processes The description of transport processes. The structural and functional properties of membrane transport proteins.

Cellular homeostatic mechanisms The mechanisms by which cells control their composition and volume.

Signal-response coupling The mechanisms by which cellular activity is controlled by events external to the cell. This includes receptor mechanisms, second messenger systems and the major types of cellular responses.

The cytoskeleton The structure of the cytoskeleton and its role in cellular processes such as motility.

Cell-cell and cell-matrix interactions The mechanisms by which cells adhere to eachother and to their substrate and the influence of this on cellular behaviour.

Cell Pathology 3 24 units

Prof. Hunt
Qualifying course Intermediate core courses
Classes Yr: (1 tut & 11 prac)/wk
Assessment one 3hr exam, 12 prac reports, one project report

This course is the same course as currently offered for the Bachelor of Science degree. Entry is restricted to a very limited number of students. Further information regarding the course content is in the Cell Pathology section of the handbook.

Biochemistry 3 (Molecular Biology and Metabolism) 12 units

Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff
Qualifying course Biochemistry 2 (Medical Science)
Classes Sem 1: (4 lec & 8 prac)/wk
Assessment one 3hr & one 2hr theory exam, prac work, one 1.5hr practical exam

The lecture course consists of core and option components. The practical course is designed to complement the lecture course and to provide students with experience in a wide range of techniques currently used in biochemical and molecular biology laboratories.

Core lectures
The core lectures are in four broad areas: molecular biology, immunology, metabolism, and physical biochemistry. The molecular biology section is the most extensive and covers molecular cloning and analysis of nucleic acids (including DNA structure and sequencing, the enzymes used in molecular cloning and nucleic acid analysis, analysis of RNA and the basis of molecular cloning) and chromosome structure and replication in eukaryotes. The immunology covers the use of monoclonal antibodies in immunoassays, the general nature of the immune system, and the protein chemistry and molecular biology of immunoglobulins. The metabolism part of the course covers the regulation of metabolic pathways, hormone action, and the biochemistry of exercise. The physical biochemistry component is concerned with the physical nature of macromolecules and methods for studying them.

Option lectures
The lecture course contains two 6-lecture option series. The options available will include some of the topics listed below. Those topics in this list which are not available in Biochemistry 3 (Molecular Biology and Metabolism) will be offered in the Biochemistry 3 (Physical and Macromolecular) option lecture series in second semester.

Option lecture topics
The vitamins: anti-dxidants, enhancers for gene transcription, cofactors in the enzymology of metabolism
The macronutrients: proteins, fats and carbohydrates
Cancer: oncogenes and the cell cycle
Experimental and clinical approaches to cancer treatment
The biochemistry of neutrophils in health and disease
The biochemistry of heart disease: atherogenesis, lipoproteins and reactive vessel walls
Enzyme kinetics
The biochemistry of insulin
Cellular immunology
The biology of immune complexes
Structure, functions and design of macromolecules

Molecular biology of development
Xenobiotica
NMR spectroscopy: an insight into biomolecular structure and function
Looking inside cells with NMR: basics
Looking inside cells with NMR: clinical aspects .
Dynamic changes in cell architecture
The cy toskeleton: its role in disease, signal transduction and metabolism
Macromolecular interactions: self-association of proteins
Macromolecular interactions: interaction of proteins with other proteins and other molecules
Nutrition: inorganic elements
Lipoproteins
Insect biochemistry
The extracellular matrix: the dynamic structure of the vertebrate body
The cytoskeleton: dynamic engineering in eukaryote cells
Molecular biology of the bacterial cell cycle
Medical molecular biology

Textbooks
B. Lewin *Genes V* (Oxford U.P., 1994)
B.R. Glick and JJ. *PatemakMolecularBiotechnology: Principles & Applications of Recombinant DNA'* (ASM Press, 1994)
and either
C.K. Mathews and K.E. van Holde *Biochemistry* (Benjamin/ Cummings, 1990)
or
L. Stryer *Biochemistry* (Freeman, 1988)

Biology 3 (Molecular Genetics and Recombinant DNA Technology) 12 units

Dr Lyon, Prof. Skurray, Prof. Willetts, Dr Raphael
Qualifying Course Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)
Classes Sem 1: (4 lec & 8 prac)/wk, one 2-day excursion
Assessment one 3hr exam, one 1.5hr exam, prac reports, seminars

A course of lectures, seminars and practicals on molecular genetics and its application to the genetic manipulation of prokaryotic and eukaryotic organisms. Lecture topics will include the molecular genetics of bacteria, bacteriophages and animals viruses including HIV, prokaryotic and eukaryotic gene regulation and expression, mechanisms of gene recombination and mutation, plasmids, transposons and mobile DNA, cloning and expression of foreign genes in bacterial, yeast, plant and mammalian cells, and applications of molecular genetics in animal and plant biotechnology. Practical work will include the use of molecular techniques such as DNA preparation, restriction mapping, gene hybridisation, cloning and sequencing, gene library screening, PCR amplification and the generic transformation of plants.

Histology 3 (Techniques) 12 units

Dr Murphy
Classes Sem 1: (4 lec & 8 prac)/wk
Assessment one 3hr and one 2hr exam, practical

This course aims to provide students with a sound and usefully comprehensive command of histological and histochemical techniques. A quota will apply for entry into the course. The course covers all the major methods presently in use and foreshadows new developments now underway. It will provide an adequate theoretical background to appreciate why histological methods are used and why they work, and will develop practical skills used in hospital, public service, private pathology and research laboratories. The techniques described will include the following: tissue handling (dissection, fixation, embedding and sectioning); routine staining for light microscopy; techniques of light microscopy (brightheld, darkfield, phase contrast); tissuehandling for electron microscopy and staining; techniques of electron microscopy and operation of electron microscope; and theory and practice of histochemistry (staining with dyes, enzymes, lectins and immunorristochemistry for both light and electron microscopy).

History of the Life Sciences 3 12 units

Assoc. Prof. Chalmers, Dr Shortland
Qualifying course History and Philosophy of Science 2 Introductory
Classes Sem 1: (4 lec & 4 tut & 4 prac)/wk
Assessment tut assignment, one 3000w essay, project report, take-home exam

This course offers a rounded but focused account of the development of some of the central themes of biological science, or more accurately (since physiology and embryology are also treated) of the sciences of life. Starting with surveys of Greek and medieval work in the fields of classification, physiology, and reproduction, the course then examines the importance of the 16th and 17th century Scientific Revolution for the life sciences through a study of William Harvey's work on the circulation of the blood, Rene Descartes' writings on the mind-body problem, and continental European microscopical studies of plant and animal cells.

At the heart of the course is the examination of the development of evolutionary theory in the 19th and 20th centuries, and the earlier lectures provide a historical context for this examination. Eighteenth century work in classification (Linnaeus and Buff on), comparative anatomy (Cuvier) and natural history are also ingredients in the development of evolutionary ideas and will therefore be treated. Following several sessions devoted to the origins, development, launch and reception of evolutionary ideas, the course will consider later developments in life sciences, particularly in genetics. The discovery of the structure of DNA brings the course to an end.

Throughout the course, emphasis will be placed on reading and discussing primary sources and on considering the social and intellectual contexts of scientific development. It is hoped that medical science students will gain a richer appreciation of many topics in their degree course and of the human dimension to science by taking this broad option.

Neuroscience 3 12 units

Dr Martin, Dr Balcar
Classes Sem 1: (4 lec & 8 prac)/wk
Assessment exam, spot tests, essays, practical work

This course, which will be taught jointly by the Departments of Anatomy & Histology and Physiology, is concerned with the structure and function of the nervous system at the molecular, cellular and integrative level. Some examples of neurological disorders will be discussed. The following topics will be covered: the regional anatomy of the central nervous system; somatomotor and autonomic control systems; the visual, auditory and somatosensory systems; hypothalamus; development and regeneration of the nervous system. The practical component of the course consists of experiments in physiological methods, small group tutorials on neuroanatomy and small group sessions in which students discuss current research papers in a wide variety of subdisciplines of neuroscience.

Pharmacology 3 (Molecular Pharmacology and Toxicology) 12 units

DrSpence
Classes Sem 1: (4 lec & 2 tut & 6prac)/wk
Assessment two 3hr exams, classwork

This course covers two major areas of pharmacology: (1) toxicology and (2) drug design and development. Toxicology covers metabolism of toxic substances, toxicity to major organs, epidemiology and carcinogenesis. It aims to provide an overview of the topic with detailed examination of selected issues in toxicology. Drug design and development looks at the principles guiding the development of new therapeutic agents with emphasis on molecular modelling. New methods to study drug distribution and action such as positron emission topography (PET) and single photon emission computerised tomography (SPECT) scanning are also covered. As part of the course all students prepare a drug profile — a document similar to that required by regulatory authorities when a new drug is introduced. This provides students with the opportunity to become familiar firstly with regulatory procedures and secondly with the detailed pharmacology of one particular compound.

Anatomy 3 (Topographical) 12 units

Dr Provis
Classes Sem 2: (3 lec & 9 tut or prac)/wk
Assessment one 3hr exam, one prac exam, one 2500w essay

This course comprises two strands of topographical anatomy — head and neck anatomy and musculo-skeletal anatomy. The anatomy of the head and neck region will be studied in one lecture, one tutorial and one dissection class per week. The course includes study of the human skull and upper vertebral column and the associated musculatures; the anatomy and functional anatomy of the eye, ear, nose and sinuses; larynx and pharynx are also covered. Emphasis is given to the composition and distribution of the twelve cranial nerves. Musculoskeletal anatomy is covered in two lectures and two tutorials/practical sessions per week. The musculoskeletal system of the trunk and lower limb is studied with particular reference to posture and locomotion. This is contrasted with the structural specialisation of the upper limb for its manipulative and tactile functions.

Biochemistry 3 (Physical and Macromolecular) 12 units

Dr EaSterbrook-Smith, Mrs Johnston, Biochemistry staff
Qualifying course Biochemistry 2 (Medical Science)
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment one 3hr & one 2hr theory exam, prac work, one 1.5hr prac exam

The lecture course consists of core and option components. The practical course is designed to complement the lecture course and to provide students with experienceinawiderangeof techniques currently used in biochemical and molecular biology laboratories.

Core lectures
The core lectures cover three broad areas: enzymology, membranes and membrane-related phenomena and eukaryote molecular biology. The enzymology section includes steady-state enzyme kinetics, allosterism, mechanisms of enzyme-catalysed reactions, and examples of the use of modern biophysical and molecular biology techniques in studying enzymes. The lectures on biological membranes include discussions of the biochemical basis of vision, photosynthesis and the role of membranes in energy transduction. The eukaryote molecular biology lectures are concerned with gene expression and control in eukaryotes.

Option lectures
The course includes four 6-lecture option series. The topics offered will be those which were not available in the Biochemistry 3 (Molecular Biology and Metabolism) option series in first semester. (See description of Biochemistry 3 (Molecular Biology and Metabolism) course).

Textbooks
B. Lewin *Genes* V(Oxford U.P., 1994)
B.R.G]idkand].].FateimikMolecularBiotechnology:Principles & Applications of Recombinant DNA (ASM Press, 1994)
and either
C.K. Mathews and K.E. van Holde *Biochemistry* (Benjamin Cummings, 1990)
or
L. Shyer *Biochemistry* (Freeman, 1988) ■.

Biology 3 (Eukaryotic Genetics and Development) 12 units

Assoc. Prof. Armati, Dr Donald, Assoc. Prof. Gillies, Dr Raphael and others
Qualifying course Biology 2 (Molecular and General Genetics) Auxiliary or Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)
Classes Sem 2: (4 lec & 8 prac)/wk, one 2-day excursion. Timetable 3
Assessment one 3hr exam, one 1.5hr exam, prac reports, seminars

A course of lectures, seminars and practicals on molecular genetics and its application to the understanding of mammalian and human genetics, animal development and evolutionary biology. Lectures will cover molecular and ultrastructural arrangement of DNA sequences and genes in eukaryotic genomes and chromosomes, mammalian gene organisation and expression, biochemical and

molecular genetics of human disease, linkage and mapping, genetics of early animal development, nerve cell differentiation and growth, MHC function and recognition of self, sequence evolution, population and evolutionary genetics. Practical work will provide experience with a range of molecular, cytological and genetical skills while illustrating theoretical principles.

Histology 3 (Developmental Biology) 12 units

Dr.McAvoy
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment two 3hr exams, assignments, prac reports

The theme of this course will be the investigation of mechanisms that control animal development. A quota will apply for entry into the course. The processes of fertilisation, cleavage, gastrulation and formation of the primary germ layers will be studied in relation to their roles in the developmental process. Mechanisms of cell differentiation, roles of inductive cell and tissue interactions in morphogenesis and differentiation, and pattern formation will be studied at the molecular and cellular levels. The practical sessions will have an emphasis on the design of experimental procedures to answer developmental questions. The selection and use of appropriate molecular and cellular techniques will also be dealt with.

Immunology 3 12 units

Dr Britton
Classes Sem 2: (3 lec & 1 tut & 8 prac)/wk
Assessment exam, essays, prac

This course, which will be taught by the Immunology Unit of the Department of Medicine, is designed to provide a comprehensive understanding of (i) the components and function of the immune system; (ii) the mechanisms of pathological immune processes; (iii) immunological techniques in diagnostic and research laboratories. A quota will apply for entry into the course. The following topics will be covered: the normal immune system; immunopathology; and immunological techniques.

Infectious Diseases 3 (Infection and Diagnosis) 12 units

Dr Harbour, Prof. Reeves
Coreq Microbiology 3 (Molecular Biology of Pathogens)
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment one 3hr exam, one 1hr prac, three lab reports

This course is coordinated by the Department of Infectious Diseases with assistance from the Department of Microbiology. The intake is restricted to a very limited number of students, and intending students should consult the Department of Infectious Diseases.

The course is designed to provide an understanding of the infection process involving host-parasite interactions as well as the scientific basis of diagnosis and control. A small number of infections will be examined to show how traditional and advanced technology can be combined for diagnosis and epidemiological study of infectious disease In addition, students will be expected to participate in a short vacation assignment of work experience in an approved diagnostic^Or public health laboratory.

Microbiology 3 (Molecular Biology of Pathogens) 12 units

Prof. Reeves, Dr Harbour
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment two 2hr exams, practical

This course is designed to provide an understanding of microbial disease at the molecular level. The followingtopics will be covered: introductory bacterial genetics; pathogenic processes and the molecular basis of pathogenicity in bacteria; structure and function of microorganisms and action of antibiotics and chemotherapeutic agents; and pathogenic processes in fungi and viruses.

Neuroscience 3 (Advanced) 12 units

Prof. Stone, Prof. Bennett
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment exams, research report or essay

This course, which will be taught jointly by the Departments of Anatomy & Histology and Physiology, will allow students to study in depth a range of topics in neuroscience, at the molecular, cellular and integrative level. The topics covered are: the relationships between glia and neurones; the molecular basis of brain function; the integrated central neural control of autonomic and somatomotor functions; vision and higher cortical functions. Practical work will take the form of either an experimental project carried out in a research laboratory or an extensive library research project.

Pharmacology 3 (Neuro- and Cardiovascular) 12 units

Dr Spence
Classes Sem 2: (4 lec & 2 tut & 6 prac)/wk
Assessment two 3hr exams, classwork

This course provides a comprehensive, systematic study of three major areas of pharmacology: neuropharmacology, cardiovascular pharmacology, and respiratory pharmacology. The neuropharmacology component examines the actions of psychoactive drugs at all levels from single cells through to behaviour. The cardiovascular and respiratory components examine therapeutic intervention in disease states such as hypertension and asthma and the mechanisms of drug action.

In addition to the core course students choose an elective from a number offered by the Department These cover specific topics in depth and some are laboratory based. Details of these are available from the Department before the commencement of second semester.

Physiology 3 (Heart and Circulation) 12 units

Dr Hoh (course supervisor) and Department of Physiology staff
Classes Sem 2: (4 lec & 2 tut & 6 prac)/wk
Assessment one 3hr exam, essays, prac reports, seminar presentations

This course offers an up-to-date and in-depth treatment of the structure and function of the cardiovascular system at the organ system, cellular and molecular levels. There is a particular focus on exercise physiology and the way in which the heart, circulation and muscle contribute to the limits of sporting achievement. The course is designed to build on material presented in both Human Life Sciences 2 and Human Life Sciences 3 (Cellular and Molecular). The excitability, contractility and energetics of the heart and blood vessels are studied, and the regulation of these organs by local (physical and chemical) factors, hormones and the nervous system are discussed, with emphasis on cellular and molecular mechanisms. At the systemic level, the course deals with short-term (neural) mechanisms controlling the blood pressure, and how the system behaves during exercise and other stresses. Long-term (hormonal) mechanisms regulating blood pressure via the renal control of extracellular fluid volume, and the pathophysiology of atherosclerosis and hypertension are also discussed. Lectures are combined with practical laboratory experiments on mechanical models, animals and human subjects.

Honours Degree

The Bachelor of Medical Science Honours degree is governed by regulations of the Senate and of the Faculty of Science that are parallel with those of the Bachelor of Science Honours degree as set out in this handbook.

An honours degree may be taken by students of sufficient merit in any of the departments offering core or option courses in third year. Entry to honours courses is regulated by individual departments and the exact detail of honours programs also varies from department to department. Students interested in undertaking honours should consult the relevant department for further details.

6 Other Faculty information

General University information

This chapter of the handbook is concerned specifically with the Faculty of Science. For further details about the University — its organisation, examinations, child care facilities, assistance for disabled students, housing, health, counselling, financial assistance, careers advice and a range of other matters — see the separate publication *University of Sydney Diary,* available free from the S tudent Centre or from University of Sydney Union outlets.

Enrolment

Students enrolling in either Science, Pharmacy or Medical Science must have courses approved by a Faculty adviser, who will be on duty in the Enrolment Centre, before completing enrolment.

Students enrolling in any first year (Junior) science course will have an individual timetable prepared for them which must be collected during the orientation week at the Timetable Registration Centre in the Carslaw Building.

(Master in Nutrition and Dietetics and *Master of Nutritional Science.* Intending candidates for these degrees should note the special closing date for applications of 15 November in the year preceding the year of enrolment.)

Scholarships and prizes: undergraduate

This handbook contains simplified details of some of the prizes and scholarships offered by the University. For full details you are advised to consult the Scholarships Office.

The scholarships and prizes may be scheduled as follows:

Prizes awarded automatically on residts. Successful students are notified of these by the Records Services section.

Prizes awarded on application. Closing dates for these may be obtained from the Scholarships Office.

Prize or scholarship	**Value** $	**Qualifications**
Alumni Scholarship	3000 p.a. up to 4 yrs	TER of 95 or above. Awarded on the basis of academic merit and personal attributes.
Australian Coal Association	600-1200 (closes mid January)	In Mining, Mechanical or Electrical Engineering Engineering or Geology. Applications to: Secretary, Australian Coal Association, GPO Box 2668, Sydney 2001.
Robert Campbell	200 p.a.	Students in financial need and of sufficient merit. Application from Year 1 students at any time.
Canon	10 000 p.a.	Honours students enrolled in Computer Science.
Council of Education	400 p.a.	Children of teachers or officers in the Department of Education of at least three years' standing. Certificate of eligibility required.
Earth Resources Foundation Scholarship	1000	Proficiency in Geology.
A.P. Elkin Fund	varies	Students of Aboriginal descent.
Farrand Scholarship	2500	Full-time first year BSc student who in the immediately preceding year completed the HSC, or an equivalent examination. Awarded on the basis of academic merit.
Freemasons' (2)	300 p.a.	Sons of freemasons of five years' standing. Certificate of eligibility required.
Joint Coal Board	700-1200 (closes mid-January)	In Mining Engineering or Geology. Application to; The Secretary, Joint Coal Board, GPO Box 3842, Sydney 2001. Graduates to work in coal mining or related fields
Lewy Miall Pattinson	300-1000	Proceeding to honours, higher degree or diploma in Pharmacy *or* Science graduates for research in Pharmaceutical Science.

Prize or scholarship	Value $	Qualifications
Mining and Metallurgical	200 p.a.	In Geology, Chemical orMechanical Engineering. Year 1 students not eligible.
James Robinson Orange Memorial Prize	700	Children or grandchildren of members of the Loyal Orange Institution. Certificate of eligibility required.
Procter and Gamble	2500	Awarded on academic merit and leadership qualities.
Roland H. Thorpe Prize	200	MostproficientstudentinPharmacology3inFaculty of Science (provided that student's work is of sufficient merit).
Universities Credit Union Scholarship	500	Undergraduates who are members (of at least one year's standing) of Universities Credit Union.
Universities Science Scholarships	500	Full-time first year BSc students who in the immediately preceding year completed the HSC, or an equivalent examination. Awarded on the basis of academic merit.

Prize compositions. Details of these may be obtained from the Scholarships Officer with whom applications generally close in the third week of second semester.

Bursaries. Bursaries are awarded on the combined grounds of financial need and academic merit and application may be made at any time to the Financial Assistance Office (open Monday to Thursday from 9.30 am to 2.30 pm).

Applications are invited for the following:

Student membership of the Faculty

The Constitution of the Faculty of Science provides that, in addition to the *ex officio* and academic staff members of the Faculty, there shall be the following categories of membership:

1. not more than three persons distinguished in the field of Science and its teaching, appointed by the Faculty on the nomination of the Dean;
2. not more than eight students, undergraduate or postgraduate, enrolled as candidates for a degree or diploma in the Faculty of Science elected in the manner prescribed by resolution of the Senate; and
3. not more than five persons, who have teaching, research or offer appropriate associations with the work of the Faculty, appointed by the Faculty on the nomination of the Dean.

Three of the eight students are elected annually by the undergraduate students in the faculty, two are elected by the postgraduate students and one each is nominated by each of the Sydney University Science Association, the Sydney University Pharmacy Association and the Sydney University Postgraduate Representative Association.

The Senate resolutions for the student membership of the Faculty of Science are set out in full in the *Statutes and Regulations 1994-95.*

Students may request permission to attend Faculty meetings as observers. Details are available from the Faculty office.

Map Library

The Map Library within the Department of Geography in the Institute Building is open to all faculties and departments in the University. The collection offers world coverage with 45 complete topographic series produced by agencies within the various countries, together with geological, regional, thematic and specialist maps. There are also a number of maps of historic interest. Atlases are held in the Geography Library close by.'

Among the local holdings of the library are the Australian topographic series of 1:100 000,1:250 000, as well as maps produced by the Departments of Lands and Mineral Resources, the Forestry Commission, conservation and planning establishments, census departments, and most other map producing agencies throughout Australia.

The Map Library, which contains over 80 000 maps, is open from 8.30 am to 4.30 pm on weekdays. Its comprehensive collection of wall maps is available for lecture use throughout the University. In other respects the library is for reference only, map identity being obtained from a visual index or catalogue. The map custodian is the chief cartographer of the Department of Geography.

Marine Studies Centre

The Marine Studies Centre integrates and coordinates teaching, supervision of postgraduate students and researchin all aspects of marine sciences. Membership of the Centre is open to academic staff and research students workingin marine studies. The Centre is run by the Director and the Board which oversees coursework and research initiatives. Operation of the One Tree Island Research Station on the Great Barrier Reef is a responsibility of the Centre. The Centre also facilitates contact from the public about, and advises the University on, all matters of research and teaching in marine sciences and related environmental and resource issues.

Further information is available from the Director, Marine Studies Centre, tel. (02) 351 2699. .

Mathematics Learning Centre

Lecturer-in-charge Jacqueline M. Nicholas

The Mathematics Learning Centre offers help to students who enter the University with insufficient preparation in mathematics to enable them to cope either with the normal first year mathematics courses or with the mathematical requirements of other subjects.

Many university courses assume that students have a certain level of knowledge of mathematics. These include junior courses in chemistry, computer science, economics and physics and many intermediate senior courses,among them biology, physiology, psychology and some options in marine sciences. You should check your faculty handbook carefully to see what is assumed in the courses you have chosen. If you know that you lack the assumed knowledge, or if you are doubtful whether you are well enough prepared for a course, you should contact the Mathematics Learning Centre.

At the centre we can advise you about your choice of courses, and help you decide which topics you need to do extra work on. We provide resources for individual study, with guidance from tutors, and we also arrange small supplementary tutorials for students who are having difficulties. Introductory and bridging courses are organised during the summer.

Location The centre is on the 4th floor of the Carslaw Building (go to the 4th floor from the stairway opposite the Stephen Roberts Theatre). Any student seeking assistance should call at the centre, or phone 351 4061.

Faculty and departmental societies

Sydney University Science Association

As a student in the Faculty of Science you are a member of the Sydney University Science Association (SUScA), the faculty society. Part of the fee you pay to the SRC is allocated to your faculty society; the Science Association uses this money to promote activities of both an educational and a social nature.

The Association holds a number of activities throughout the year, including barbecues and the Annual Science Ball. The Science Association appoints sports directors who help organise interfacuity sport.

The association runs a stall during orienta tion week, where T-shirts are sold and you can find out more about what the association does. *The Science Bulletin* (official publication of SUScA) which heralds information concerning the activities of SUScA and Science departmental societies, is produced weekly and can be found on official departmental noticeboards. The postal address is Box 270, Wentworth Building, University of Sydney, 2006.

The affairs of the association are governed by a council consisting of office bearers, delegate members from member societies, student members of-faculty and nine members elected at the annual general meeting/at least three of whom are first year students. You are encouraged to attend the AGM (held in First Semester) and to take an active part in the association and on council. Council meets regularly during term and all members are invited to attend the meetings. These areadvertised in the *Daily Bull.* Your attendance will ensure that SUScA effectively meets the needs of science students on campus.

Member societies

A number of the departments within the Faculty of Science have departmental societies, for example the Alchemist's Society, Biochemical Society, Biological Society, Geographical Society, Geological Students' Society, Mathematical Society, Microbiology Society, Physics Society, and Psychological Society. The societies receive grants from the Science Association. They organise talks, films, field trips and other activities relating to their particular discipline, as well as parties, wine and cheese evenings and other social activities. Most departmental societies have a stall during the orientation period.

Employment for graduates in science

The field of employment for science graduates is extraordinarily wide, ranging from the dedicated research scientist in a university or research laboratory to the managing director of a large corporation, the school teacher, the technical representative, the laboratory bench worker, the production superintendent, the consultant geologist, the bird banding biologist, the actuary, the computer sales representative, the beachcomber.. .the list is endless. Many science graduates choose to undertake further study to prepare themselves for employment. There is a wide range of graduate diplomas and coursework masters degrees available. Some of these are: biotechnology, food technology, computers and control, electronics, nutrition and dietetics, and the better known ones such as educationandlibrarianship.

Some science graduates complete a Bachelor of Engineering degree after an additional two years' study. This qualifies them as professional engineers, with a wide range of additional job opportunities in aeronautical, chemical, civil, electrical, mechanical and mining engineering. If you wish to consider this option, it is important to make sure that you choose the appropriate prerequisite subjects in your science degree.

It is prudent to plan your course with a career in mind, or a couple of careers if possible. For example, even though you might be sure you want to teach mathematics, you might include some computer science in your course so that if you did not like teaching you would have another choice of career. Alternatively, you might have your heart set on being a biologist, but as an insurance policy in case you could not get a job as a biologist, you might consider majoring in biochemistry, microbiology or chemistry to widen the scope. This is not to say you should give up too easily if you want to be a biologist. In areas where jobs are not too plentiful (and biology usually falls into this category), you have to start right at the beginning of your course to prepare to secure that job on graduation. Some suggestions are to learn scuba-diving, join the bush-walking or speleological clubs,

work in the vacation for one of the national parks-for nothing if necessary-and make as many personal contacts as you can. Such evidence of keenness and initiative impresses an employer. As you will have understood, it is not only your academic ability an employer looks at but also your personality, evidence of a sense of responsibility and activities beyond the set curriculum.

Similarly, if you want a job related to chemistry, physics, geology, computer science, biochemistry, etc, do your best to obtain a vacation job that will enable you to claim relevant experience when applying for your first job. These vacation jobs are hard to get, admittedly, but the extra leg-work and initiative involved in finding one will pay off in the long run.

Careers and Appointments Service

The Careers and Appointments Service (CAS) can help you throughout your course. Visit it as often as you like. Some of the areas in which CAS might be of assistance to you are: to help you plan a science course that fits in with your personal aptitudes and interests and that keeps as many career options open for you as possible; to answer any queries you may have about careers (CAS has a careers library that you can browse in whenever you feel like it); to let you know about job prospects for any subject you wish to major in; to help you find employment on graduation; and last but not least, CAS's Student Employment Section is able to offer you vacation employment and part-time jobs throughout the year.

You will need to make an appointment to talk with one of the advisers about careers, but you do not need one to use the careers library or the Student Employment Section.

CAS is in the Mackie Building, Arundel Street, Forest Lodge, cross the Parr amatta Road footbridge at the Holme Building, turnleft, and it is the first building you come to.

A brief history of the Faculty

On 17 April 1882 there was a special meeting of the University Senate to receive a report from the By-laws and Curriculum Committee. The adoption of this report was moved by Mr Rolleston; it recommended:

1. There shall be four Faculties in the University-viz. Arts, Science, Medicine and Law.
2. All undergraduates shall attend first year Arts and after satisfactory examination at the end of first year 'may elect which of the following Faculties, whether Arts, Science or Medicine, they will graduate in, and after the Second Year examination' they may elect to graduate in Law.

After deciding upon the regulations for the Faculty of Arts the meeting was adjourned to the following day. It was then (18 April 1882) that regulations for the Faculty of Science were formulated. Two degrees, BSc and DSc, were established. The course of study in the bachelor's degree was as follows:

First Year Arts: Latin; one of Greek, French or German; mathematics; elementary chemistry; elements of natural philosophy.

Second Year: chemistry; physics; natural history; mathematics; French or German.

Third Year: At least three of: chemistry; physics; mathematics; mineralogy; geology and palaeontology; zoology and botany.

This, then, was the formal beginning of the Faculty. It was not the beginning of the teaching of science in the University. The first professors, all based in the Faculty of Arts, arrived in 1852; they were the Rev. Dr John Woolley (Classics), M. B. Pell (Mathematics and Natural Philosophy) and John Smith (Chemistry and Experimental Philosophy (i.e. Physics)). In 1853 there were suggestions that chairs in geology and natural history be established; however, no appointments were made. There was evidently some pressure for academic studies in geology and mineralogy and in 1866 A. M. Thomson was appointed reader in geology and mineralogy and demonstrator in practical chemistry. In 1870 he became professor of geology.

In 1880 two events occurred that were to have a profound influence upon the development of the University: the Public Instruction Act, framed by Sir Henry Parkes, was passed by the N.S.W. Parliament; and John Henry Challis died. The Public Instruction Act meant that a much wider group of children received a secondary education and formed a reservoir for increased university enrolments. And upon the death of Challis, a prosperous businessman who had earlier endowed the remarkable Royal Window in the Great Hall, it was revealed that he had left his fortune to the University. This money, a colossal sum for the then financially struggling institution, was to accrue for five years after the death of Mrs Challis, and when finally received in 1889-90 amounted to more than £250 000. At that time the annual governmental funding was around £5-10 000, and by 1902 had risen to only £14 000. The knowledge of these riches-to-come gave the Senate a sense of financial security for the first time; hitherto, apart from fees charged, the University had been completely dependent upon the Government of New South Wales. There was an air of optimism; the University could expand instead of merely survive.

On26 July 1882 the draftofaBill went to Parliament entitled 'A Bill for attending the Faculties and Schools in the University of Sydney and for other purposes in relation thereto'. The Senate was empowered to establish the Faculty of Science, the government providing themoney required until the Challis bequest should be received. In 1882 the chair of geology was replaced by a chair in natural history, and J. S. Stephens was appointed to it. He also doubled as professor of classics from 1884, when the Rev. Dr Charles Badham died, until a new appointment was made. The chair of chemistry and experimental philosophy was divided. Smith retaining chemistry, the new chair of physics being filled by R. Threlfall. He insisted upon the introduction of practical work and designed and supervised the construction of a physical laboratory. The names of the first graduates in science appeared in the *Calendar* for 1885. They were Frank Leverrier and Clarence E. Wood. By 1890 there were nine graduates, including the first woman, Fanny E. Hunt (1888).

In 1890 the obligatory year of Arts for entry to the Faculty of Science was dropped. Entry became by means of an Arts degree, a pass in Arts I or a pass in the Senior Public Examination (equivalent to today's HSC) or equivalent examination in the following subjects: Latin; one of Greek, French or German; and three of arithmetic, algebra, geometry, trigonometry, elementary surveying and astronomy, mechanics, and applied mechanics. There was now a three-year course in science (the fourth year for honours came in 1922) and all first year students took biology, chemistry, mathematics, physics and physiography.

In 1932, when the Faculty was 50-years-old, there were six chairs: physics, chemistry, zoology, geology and physical geography, botany, and chemistry (pure and applied). There were 353 undergraduates. In 1982 (the centenary year) there were 31 chairs; many of these were in new disciplines, and some disciplines had several professors. The number of students had grown to 2500.

At the end of the Second World War, the Commonwealth Reconstruction Training Scheme provided entry to the University for many ex-servicemen and ex-servicewomen. The increased numbers of students required additional facilities; the staff was enlarged and several temporary buildings (some of which are still in use) were put up. The next period of expansion came in 1951 when the then Prime Minister, R.G. Menzies, announced the entry of the Commonwealth Government into University financing. This led to the expansion of the University into the Darlington area and the erection of many new buildings: Carslaw, Chemistry, Geology and Geophysics, and Biochemistry, to name a few.

In 1954 a donation from Adolph Basser enabled the Uni versi ry to buy its first computer; in 1956 an electron microscope was purchased. These items of major equipment opened up many new fields of research and teaching.

Undergraduates have come to play an increasing part in the activities and operation of the Faculty. In 1904 the Science Society was established, which eventually became the Sydney University Science Association, and in 1971 the first students were elected to the Faculty of Science.

In 1985 the Faculty celebrated the centenary of its first graduates. A series of lectures, exhibitions, films and social events was held. A history book *Ever Reaping Something New* was published. A film about the Faculty entitled *A Century of Science was* also produced and broadcast nationally by the ABC.

7 Postgraduate study

Higher degrees

The higher degrees in the Faculty of Science are:

MSc	Master of Science
MPharm	Master of Pharmacy
MPsychol	Master of Psychology
MNutrDief	Master of Nutrition and Dietetics
MNutrSc	Master of Nutritional Science
PhD	Doctor of Philosophy
DSc	Doctor of Science

The regulations governing the award of these degrees are printed in the University *Calendar*. Prospective candidates should consult with the head of the department most closely concerned as early as possible

Doctor of Philosophy

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required (mainly in the form of seminars) but in no case is it a major component.

Applicants should normally hold a master's degree or a bachelor's degree withfirst or second class honours of the University of Sydney, or an equivalent qualification from another university or institution.

The degree may be taken on either a full-time or part-time basis.

In the case of full-time candidates, the minimum period of candidature is two years for candidates holding a master's degree or equivalent, or three years in the case of candidates holding a bachelor's degree with first class or second class honours; the maximum period of candidature is normally five years.

Part-time candidature may be approved for applicants who can demonstrate that they are engaged in an occupation or other activity which leaves them substantially free to pursue their candidature for the degree. Normally the minimum period of candidature will be determined on the recommendation of the Faculty but in any case will be not less than three years: the maximum period of candidature is normally sevenyears.

MSc and MPharm

Graduates of the University of Sydney with first or second class honours and candidates in the final year of an approved honours course for the BSc or BPharm degrees or who have an equivalent qualification from another institution or an equivalent standard of knowledge, may apply for admission to candidature for the MSc degree. Once admitted, candidates proceed full-time or part-time, by supervised research and thesis, or in some cases by coursework and essay.

A graduate who holds the degree of BPharm of this University with first or second class honours, or, with approval, an equivalent qualification from another institution, may apply for admission to candidature for the MPharm degree. This degree is completed by research and thesis.

An application should be lodged with the Faculty. It must be supported by the head of the department concerned and approved by the Faculty. If qualifications have been obtained in another university or institution then an application must also be approved by the Academic Board. If an applicant has the prerequisite qualifications, admission to candidature may be approved provided the necessary staff and facilities are available, including adequate accommodation and any special equipment. Some candidates must satisfy a preliminary examination before being admitted to full candidature.

Full-time candidates
Minimum period of candidature: 1 year
Maximum period of candidature: 2 years

Part-time candidates
Minimum period of candidature: 1 year
Maximum period of candidature: 4 years

MPsychol

The degree of Master of Psychology provides professional training in clinical psychology and involves supervised field experience for two days a week during semester up to three days a week during vacations. Formal classes are held in assessment of problem behaviour, behaviour change, clinical research techniques, neuropsychology, and related topics. A research thesis is also required.

Candidates for the degree must normally hold the degree of Bachelor of Arts or Science with honours in Psychology and have completed work in abnormal psychology acceptable to the Faculty.

The course for the MPsychol degree can be completed in two years of full-time study or four years of part-time study.

Some details of the course arrangements and requirements are as follows:

1. Candidates for the degree are required to complete satisfactorily—
   (a) a coursework component according to the syllabus approved by the Faculty of Science;
   (b) a practicum component involving both training in therapeutic and assessment techniques and field placements;
   (c) a research project and submit a dissertation on that project.
2. (a) The requirements for the degree shall be completed in two parts; and Part I must be satisfactorily completed before Part **n.**
   (b) Full-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I of the course within one year of first

enrolment and to complete Part II of the course within two years of first enrolment,

(c) Part-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I of the course within two years of first enrolment and to complete Part II of the course within four years of first enrolment.

The following syllabus has been approved by the Faculty of Science:

1. *Course component*
   The following topics are covered: abnormal behaviour; assessment; behaviour change; behavioural medicine; child abnormal psychology; intellectual, physical and sensory handicap; neuropsychology; professional issues; psychometrics; psychopharmacology; psychophysiology; research methods.
   Assessment: four written papers to be taken by the end of Par 11 together with essay and seminar papers over both parts of the course.
2. *Practicum component*
   Students are required to undertake training in both therapeutic and assessment techniques and to undertake field placements.
   Assessment: by mastery tests, supervisors' reports, written or oral case presentations.

MNutrDiet and MNutrSc

The MNutrDiet is a course designed to survey all aspects of human nutrition, with special emphasis on the needsof dietitians who will be working in Australia. It provides the basic training for hospital and community dietitians and nutritionists and is one of the recognised professional courses for dietitians in Australia.

The MNutrSc provides the same survey of all aspects of human nutrition in the first year but is designed for those persons who wish to undertake research in this area. The second year is devoted to a research project, with regular seminars.

Admission

An applicant for admission to candidature of either degree course mustbe a graduate and have completed full second year University courses in Biochemistry and Human Physiology[1] or equivalent courses. Applications for admission should be lodged with the Registrar by 15 November of the year prior to the one in which candidature is sought.

Timing

Both courses occupy two years. The first year is common to both and involves academic study in prescribed courses. In the second year the courses proceed as follows:

MNutrDiet. One semesterisdevotedtoashortresearch project, which is presented for examination in the form of a long essay. The other semester is for clinical training in dietetics in recognised teaching hospitals and in community dietetics.

MNutrSc, A candidate carries out an original investigation on a topic which will result in the writing of a short thesis.

Lecturers

The courses are taught and coordinated by the Boden Professor of Human Nutrition and the staff of the Human Nutrition Unit with the cooperation of the Nutrition and Dietetics Department of the Royal Prince Alfred Hospital and the Dietetic Department of the Children's Hospital Camperdown. There are specialist lecturers from several departments at the University of Sydney (Medicine, Public Health, Geography, etc.), from the School of Food Technology at the University of New South Wales, and other specialist institutions.

The courses are supervised by a Board of Studies in Nutrition and Dietetics, whose chairperson is the Dean of the Faculty of Science.

Courses of Study

First Year

1. Nutritional Science
2. Nutritional Biochemistry
3. Food Science and Technology
4. Food Intake Measurements
5. Community Nutrition
6. Public Health Nutrition
7. Medicine
8. Clinical Nutrition and Therapeutic Dietetics
9. Food Service Management and Production
10. Principles of Communication and Education
11. Sociology and Anthropology of Food Habits
12. Principles of Professional Dietetic Practice (MNutrDiet only)

Second Year

(a) Dietetic Practical Placement in approved hospital and community health centres (one 20-week semester).

(b) Research Project. One semester on a supervised research project approved by the Head of the Human Nutrition Unit.

Students attend the University on a regular basis to undertake the following senior courses:

1. Management
2. Theory of Counselling
3. Dietetic Counselling
4. Advanced Clinical Nutrition
5. Advanced Community Nutrition

Assessment

First Year of MNutrDiet & MNutrSc: four 3-hour exams (Nutritional Science I and II, Clinical Nutrition and Public Health Nutrition) and assignments on food intake measurement, food habits and community nutrition.

Second Year of MNutrDiet: continuous assessment throughout the Dietetics training semester and one

[1] orinstance in a Sydney BSc degree Biochemistry 2 and Physiology 2 Auxiliary *or* in the Sydney BMedSec degree Biochemistry 2 (Medical Science) and Human Life Sciences 2.

final 3-hour exam. Research semester is assessed by presentation of a long essay and formal oral presentation.

Second Year ofMNutrSc: Assessment is by progress in the two semester research projects and by the short thesis based on the candidate's research.

Graduate diplomas

Graduate Diploma in Science

The Graduate Diploma in Science serves as an entry qualificationfor the degrees of Master of Science, Master of Pharmacy or Doctor of Philosophy. It consists of equivalentwork to thatcarriedoutby candidates enrolled in the fourth year honours courses, and is available to candidates who are not eligible to enrol in those courses. Entry to the Graduate Diploma is subject to approval by the relevant head of department and confirmation that requirements for the award of the degree of Bachelor of Science, Bachelor of Pharmacy, Bachelor of Medical Science, or an equivalent degree have been met.

Graduate Diploma (Computational Science)

Graduate Diploma (Environmental Science)

Graduate Diploma (Optical Fibre Technology)

Resolutions of the Senate governing the Graduate Diploma in Science and the other graduate diplomas above may be found in the *Statutes and Regulations 1994-95.*

Diploma in Hospital Pharmacy

Dr Armour (coordinator)
Classes and Assessment details from Department
Admission consult the coordinator

Hospital experience
Students spend approximately two-thirds of the course time in hospitals where comprehensive programs of clinical and other hospital pharmacy activities are conducted. Students work in four different hospitals throughout the year.

Courses of study
*Therapeutics** This course consists of approximately 100 hours of lectures and 50 hours of tutorials. Lectures cover pathophysiology, clinical manifestations and treatments of diseases with emphasis on current drug therapy. Tutorials are broadly based with emphasis placed on current hospital pharmacy practice.

Clinical Epidemiology This is a course of lectures and tutorial/discussionsessions (approximately one hour per week) in which clinical study designs are examined. Current clinical scientific and medical literature is critically evaluated.

*Therapeutic Drug Monitoring** This course, in approximately 15 hours distributed over the year, presents the clinical pharmacokinetics of relevant drugs.

Clinical Biochemistry This course consists of nine lectures covering the procedures used for determination of biochemical and microbiological values in patients and the interpretation of these tests with respect to the clinical evaluation of the patient and the assessment of drug therapy.

Case History Presentation This course involves development of skills required to access current information on new technology and/or drugs and presentation of this information in a formal style for assessment.

Scientific Presentation This is a course of ten hours which deals with how to present orally as well as developing written skills.

Computing. An introduction to the Macintosh and IBM word processing and statistics packages is provided.

Research project
Each student carries out a hospital pharmacy-based research project selected by the director of pharmaceutical services of the participating hospital in consultation with the staff of the Department of Pharmacy. The project extends over most of the year and includes a literature survey, development of a protocol, collection and treatment of data and presentation of results in the form of written and verbal reports.

* These courses are extensions of undergraduate courses and presume adequate knowledge of the undergraduate course.

Masters Qualifying Procedure

The Masters Qualifying Procedure serves as an entry qualification/probation period for the degrees of Master of Science, Master of Pharmacy, Master of Nutrition and Dietetics, Master of Nutritional Science and Doctor of Philosophy. It is designed to cater for candidates who have satisfied the general requirements for entry to the degree program but who are required to undertake further work to satisfy the department concerned that entrance to the degree program is appropriate.

Scholarships and prizes: postgraduate

This handbook contains simplified details of some of the prizes and scholarships offered by the University. For full details you are advised to consult the Scholarships Office. The scholarships and prizes may be scheduled as follows:

Grants-in-aid These are offered by application (closing date: 31 May each year) to postgraduate students seeking assistance with travel or maintenance.

Postgraduate scholarships tenable at the University of Sydney Prospective postgraduate students should consult the Scholarships Office in August/September each year about Australian Postgraduate Research Awards (closing date: 31 October) and Australian Postgraduate Course Awards (closing date: 31 October).

Postgraduate travelling scholarships Each year the University offers five or six travelling scholarships with a closing da te in November. Generally, applicants need to have a first class honours degree approaching medal standard to be successful.

Applications for the major travelling scholarships offered by external bodies generally close in August or September.

All postgraduate scholarships are advertised in the *Administrative Bulletin* which is available in departments or from the Scholarships Office in the Holme Building.

Scholarship	Value $	Closing date for applications	Qualifications
1. Tenable at the University of Sydney			
Australian and University Postgraduate Research Awards	14 474-18 679	31 October	Graduates with Hons I. For research in any field
Australian Postgraduate Course awards	11687	31 October	Graduates with honours degrees or very good pass degrees. For master's degrees undertaken by coursework
R. and M. Bentwich Scholarship			Graduate who holds a postgraduate research scholarship and who requires a supplementary grant
Earth Resources Foundation Scholarship	10 500		Research in geology and geophysics
Farrand Postdoctoral Research Fellowship	27139-30133		Research in area of science
Henry Bertie and Florence Mabel Gritton Postgraduate Research Scholarships —			For research in chemistry in relation to industry and agriculture
Senior	27139-30133	as advertised	
Junior	15 087-16 598	as advertised	
George Harris Scholarships (2)	1200 each		One for a research student in chemistry and one for a research student in geology and geophysics
Linnean Macleay Fellowships	800-3200		Graduates in science or agriculture who are members of the Linnean Society of N.S.W.
Richard Claude Mankin Scholarship		as advertised	For research into water conservation
Postdoctoral	27139-30133		
Postgraduate	10 500		
Professor Harry Messel Research Fellowship in Physics		as advertised .	Research in physics
Postdoctoral	27139-30133		
Postgraduate	8882		
A.E. & F.A.Q. Stephens Research Scholarship	10 500	as advertised	Graduates with research experience. For research in any field
Elizabeth Wunsch Research Scholarship in Pharmacy	7100		Research in pharmacy
2. Travelling Scholarships Awarded by the University of Sydney			
Barker Graduate Scholarship	9000*	as advertised	For postgraduate research in mathematics
Harriett Beard Scholarship	9000*	as advertised	For postgraduate research in the physical sciences, engineering, veterinary science and dentistry

*Additional benefits include cost of travel and payment: of fees.

Scholarship	Value $	Closing date for applications	Qualifications
Edgeworth David Travelling Scholarship		as advertised	For postgraduate research in geology
Charles Gilbert Heydon Travelling Fellowship	10 500	as advertised	For postgraduate research in biological sciences
Herbert Johnson Travel Grants	under	31 May review	Travel grant for graduates holding travelling scholarships
James King of Irrawang Travelling Scholarship	1000	31 May	Travel grants for graduates in any faculty
G.H.S. & I.R. Lightoller Scholarship	1000	as advertised	Travel grants for graduates in Arts, Medicine, Science, Vet erinary Science, Agriculture and Engineering
University of Sydney Postgraduate Research Travelling Scholarships (2)	9000*	31 October	Graduates from any faculty
J.B. Watt Travelling Scholarship	9000*	as advertised	Graduate with Hons I in any faculty
Eleanor Sophia Wood Travelling Fellowships	varies	31 March	For overseas study or research to persons who have been engaged full-time for at least three years in teaching or postgraduate research in the University of Sydney
Awarded by external bodies			
Caltex	24 000	30 September	Female graduates completing degree or diploma in year of application
Commonwealth Scholarship and Fellowship Plan Awards	living* allowance	September	Tenable in British Commonwealth countries. For research in any field
Gowrie Postgraduate Research Scholarship (2)	4000*	31 October	Descendants of ex-servicemen. For research in any field
Nuffield Foundation Dominion Travelling Fellowship		February	For research in any field
Rhodes Scholarship	£3500+	1 October return air-fare	Age limit 25. For tenure at the University of Oxford
Rotary Foundation Fellowships.			For research in any field
Rutherford Scholarship	£3850	14 December (under review)	For experimental research in any branch of the natural sciences
Shell Postgraduate Scholarship	£3600*	25 September	Graduate in arts, science and engineering
H. Tasman Lovell Memorial Medallion			For best thesis for PhD degree in Department of Psychology
Ormsby Hamilton Radio Prize	600	awarded every two years	For an essay in any aspect of radio science

*Additional benefits include cost of travel and paymentt of fees.

8 Timetables

All students who

(a) are taking one or more first year courses
or

(b) are enrolled in any intermediate courses for the Bachelor of Medical Science degree
or

(c) are enrolled in any second year Science course except Geography 2, History & Philosophy of Science 2 and Psychology 2
and are enrolled in any degree except Bachelor of Engineering, Bachelor of Pharmacy or Bachelor of Science in Agriculture

will be required to attend a faculty location in order to be placed in lecture, tutorial or practical classes. Students in the Faculty of Science will be required to attend Lecture Room 250 in the Carslaw Building at one of the following times:

Wednesday	22 February	9.30 am-12.30 pm
		1.30 pm-4.30 pm
Thursday	23 February	9.30 am-12.30 pm
		1.30 pm-4.30 pm
Friday	24 February	9.30 am-12.30 pm
		1.30 pm-4.00 pm

Students in other faculties should consult the relevant faculty concerning locations and times.

Any student enrolled in an Engineering Science course should check details of the timetable for that course with the Faculty of Engineering office.

Table 1 contains the general timetable of Junior Courses for students proceeding towards the degree of Bachelor of Science in the Faculty of Science. Science/Law students should also see Table 4. The timetable of first year Science course lectures and practical classes for students enrolled in other faculties are contained in the handbooks of those faculties.

Tables 2 and 3 are for Science students enrolling for Intermediate and Senior courses.

Table 4 is for Science/Law students.

Tables 5 **and** 6 are for students enrolled in the Bachelor of Medical Science course.

Pharmacy students will receive their timetable at the enrolment centre.

Table 1
General timetable — Junior courses

An individual timetable for each student will be issued during the orientation period in Carslaw Lecture Room 3A. (Please refer to the information above.) Science/Law students should also consult table 4.

Course	Classes	**Series**	**Mon**	**Tue**	**Wed**	**Thu**	Fri	**Notes**
Biology 1	Lectures	**1** **2**	9 3	 2	9	 2	9	One lecture series to be allocated.
	Practical		(2-5)	(10-1) (2-5)	(10-1) (2-5)	(10-1) (2-5)	(10-1)	One 3-hour session per week will be allocated.
Chemistry 1	Lectures	Advanced &TSP 1 **2** 3	 9 **2**	9 9 	12 9 **12** **2**	9 9 	 9 **2**	One lecture series to be allocated.
	Practical			**(10-1)** (2-5)	(2-5)	**(10-1)** (2-5)		One 3-hour session per week will be allocated.
Computer Science 1	Lectures	**1** **2** 3	10 12 **2**		**10** **12** 2		**10** **12** **2**	Consult the department handbook and noticeboards. Lectures, tutorials and workshops will be allocated. Consult department for Advanced course.
Mathematics 1 (Life Sciences)	Lectures Tutorials	1 2	8 11	8 **11**		8 **11**	8 **11**	Lectures will be allocated. Two 1-hour tutorials per week will be allocated.
Geography 1	Lectures Practical	1 2	10 3 (11-1) (1-3)	 **(9-11)** **(11-1)** (1-3)	**10** 3 (11-1) (1-3)	 (9-11) **(11-1)** (1-3)	10 3 **(11-1)** (1-3)	One lecture series to be allocated. One 2-hour session per week will be allocated.
Geology 1	Lectures Practical		10		10 (2-5)	 (2-5)	10 (2-5)	 One 3-hour session per week will be allocated.
Mathematics 1 & Mathematics 1 (Advanced)	Lectures Tutorials	**1** 2	8 11	8 11	8 11	8 11	8 11	Lectures will be allocated. Two 1-hour tutorials per week will be allocated.
Physics 1 Advanced &TSP	Lectures Practical		 (10-1) (2-5)	**2** (10-1)	3 **(10-1)**	2 (10-1)	 (10-1) (2-5)	 One 3-hour session per week to be allocated.
Physics 1	Lectures Practical	1 2 3	 10 (10-1) (2-5)	9 2 (10-1) (2-5)	12 10 3 (10-1) (2-5)	9 2 (10-1) (2-5)	 10 (10-1) (2-5)	One series to be allocated. One 3-hour session per week to be allocated.
Psychology 1	Lectures			10 12 3		10 **12** 3	1 12 3	One lecture on each of the days and a 2-hour tutorial to be allocated.

Table 2

Timetable for Intermediate courses

An individual timetable for students enrolled in most of the courses listed in this table will be issued during the orientation period in Carslaw Lecture Room 3A.

Unless otherwise indicated timetables for advanced courses are the same as those for the equivalent ordinary courses.

Students enrolled in Engineering Science courses must check details of the timetable and their class allocation with the Faculty of Engineering office.

Science/Law students should also consult table 4.

The codes SI and S2 in the course column for 8 unit courses indicate the Semester during which the particular class will be held—SI=Semester 1 and S2=Semester 2. The code (A) indicates that the classes will be conducted at times shown throughout the year.

Unless otherwise indicated in the notes all classes for courses other than 8 unit courses are held throughout the year.

Alternative times are indicated by an entry in the 'Alt.' column. An asterisk (*) in this column indicates that there is some degree of choice among the times that follow. Rules for selecting from the times are given in the l\To tes' column. In most cases the actual selection will be advised when students receive a time table in the week prior to the start of lectures.

Course	Units	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Agricultural Chemistry 2	16	Lectures Practical .		*	10	(12-6)	10 (11-5)		10	Five hours practical required on one day.
Biochemistry 2	16	Lectures Practical		*	10	(11-5)	10 (11-5)	(1-6)	10 (1-6)	Five hours practical required on one day.
Biochemistry 2 Auxiliary(A)	8	Lectures			10		10		10	
Biology 2 (Animals)	16	Lectures Practical		*	3	10 (2-5)	11 (2-5)	10	(2-5)	Choose one 3-hour period. One additional hour of tutorial work by arrangement.
Biology 2 (Animals) Theory Auxiliary (A)	8	Lectures			3	10	11	10		One additional hour of tutorial work by arrangement.
Biology 2 (Genetics, Cellular & Developmental) Auxiliary (A)	8	Lectures Tutorial			11		12		11	One hour per week to be arranged.
Biology 2 (Molecular & General Genetics) Auxiliary (SI)	8	Lectures Practical Tutorial		*	11		12 (2-6)	(1-5)	11	Choose one 4-hour session. One hour per week to be arranged.
Biology 2 (Plant Anatomy & Physiology) Auxiliary (SI)	8	Lectures Audiovisual Practical		.		9 (1-6)		9 (1-6)		Four hours audiovisual plus a two hour tutorial by arrangement in certain weeks. At other times five hours of practical plus a one hour tutorial required.
Biology 2 (Plant Ecology & Diversity) Auxiliary (S2)	8	Lectures Audiovisual Practical		*		9 (1-6)		9 (1-6)		Four hours audiovisual plus a two hour tutorial by arrangement in certain weeks. At other times five hours of practical plus a one hour tutorial required.

Table 2 *(continued)*

Course	Units	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Biology 2 (Cellular & Developmental) Auxiliary (S2)	8 '.	Lectures Practical Tutorial		*	11		12 (2-6)	(1-5)	11	One 4-hour session. One hour per week to be arranged.
Chemical Engineering Science	16	Lectures Chemical Engl Lectures Chemical Eng2 Tutorials Chemical Engl Tutorials Chemical Eng2 Practical Chemical Eng2S2			10 (11-1) (3-5)	 11 	 (11) (12) (1-6)	 11 	10	This course is equivalent to U1.610 Chemical Engineering 1 and U2.610 Chemical Engineering 2. One 2-hour tutorial will be allocated each week. One 1-hour tutorial will be allocated each week.
Chemical Engineering Science Auxiliary(A)	8	Lectures Chemical Engl Tutorials			10 (11-1) (3-5)				10	This course is equivalent to U1.610 Chemical Engineering 1. One 2-hour tutorial will be allocated each week.
Chemistry 2	16	Lectures Practical		*	8 or (1-5)	8 or 12 (1-5)	 (1-5)	8 or 12 (1-5)	8 or 12 (1-5)	Two sessions per week one 2-hour, one 3-hour to be allocated. The laboratories (Inorganic, Organic, Physical) will not normally be open every day.
Chemistry 2 Long	20	Lectures Practical		*	8& 12 (1-5)	8 or 12 (1-5)	 (1-5)	8 or 12 (1-5)	12 (1-5)	Monday 8am lecture for weeks 5-10 Sem 1 only. Two 3-hour sessions per week to be allocated. The laboratories (Inorganic, Organic, Physical) will not normally be open every day.
Chemistry 2 Auxiliary (A)	8	Lectures Practical, Physical Practical, Organic Tutorial		* *	8 or 12 (1-5)	8 or 12 (1-5)	 (1-5) (1-5)		8 or 12 (1-5) (1-5)	Three hours per week during weeks 1-6 of Semester 1 for Physical, to be allocated. A 3-hour session per week during weeks 5-10 of Semester 2 for Organic. Choose one afternoon. Nine 1-hour compulsory tutorials in Physical, four in Semester 1 and five in Semester. 2.
Civil Engineering Science	16	Lectures	Materials Statics			12	12 10	9	12	This course is equivalent to the Engineering faculty courses: U2.210 (Introduction to Materials), U1.220(Statics), U2.290 (Structural Design), U2.221 (Structural Mechanics) Semester 2 only. Semester 2 only.

Table 2 *(continued)*

Course	Units	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Civil Engineering Science *(continued)*			Structures			12	11	10		Semester 1 only.
			Design		10		11			Semester 2 only.
		Practicals	Materials		(2-5)		(2-5)	(2-5)	(2-5).	Each student is required to attend four 3-hour practical classes during Semester 2 Students will be rostered to these four classes on the same day of the week each time.
			Design					2-5		Semester 2 only.
		Tutorials	Statics		(2-4)	(2-4)	(2-4)	(2-4)		Semester 2 only. One 2-hour tutorial each week will be allocated.
			Structures				(2-5)		(2-5)	Semester 1 only. One 3-hour tutorial each week will be allocated.
Computer Science 2	16	Lectures			10,12	10,12		10,12	10,12	One lecture to be taken on each of the four days. Consult department.
Entomology 2 Introductory (S2)	8	Lectures				9		9		Consult Biology enrolment advisers.
		Practical					(2-6)			
Enviromental Geology 2 Auxiliary (A)	8	Lectures			2		10		10	Consult department.
Geography 2	16	Lectures	Environ.		10	10		10		
			Geomorph.		12	12		12		
			Human			4	4	4		
		Practical assignment	*							Practical assignment and weekly tutorial at times to be arranged.
		Tutorial								Attendance at one tutorial is compulsory. See department.
Geology 2	16	Lectures			11	11		11	11	Consult department.
		Practical		*		(2,4)	(2-4)	(2-4)	(2-4)	Two afternoons by arrangement.
History & Philosophy of Science 2 Introductory (A)	8	Lectures	1		12		12			Each student attends one series of lectures and a 2-hour tutorial by arrangement. Consult department.
			2		5.15		5.15			
Marine Sciences 2 Introductory (A)	8	Lectures			9		9		9	
		Tutorials								One hour tutorial by arrangement.
Applied Mathematics 2 & 2 (Advanced)	16	Lectures	Ser1		9		9		9	Each student attends two series. Consult School for details.
			Ser2		8		8		8	
			Ser3		10		10		10	
			Ser4		4	4		4		
		Tutorials								By arrangement.
Mathematical Methods 2 (A)	8	Lectures	Series 1		9		9		9	One series to be allocated.
			Series 2		8 ,		8		8	
		Tutorials								By arrangement.
Mathematical Statistics 2	16	Lectures			11	11	11	11	11	
		Practical								One 2—hour session per week by arrangement.
		Tutorial								One tutorial per week by arrangement.
Mathematics 2 Combined	24	Lectures	Ser1		9		9		9	One of these series to be allocated.
		Methods	Ser2		8		8		8	
		Algebra			2	9		9		

Table 2 *(continued)*

Course	Units	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Mathematics 2 Combined *(continued)*		Applied Tutorials	Ser1 Ser2		10 4	4	10	4	10	Consult department about choice of series. .Three hours by arrangement.
Pure Mathematics 2	16	Lectures Methods Analysis Algebra Tutorials	Ser1 Ser2		9 8 9 2 : 	9	9 8 9	9	9 8 9	Choose one of series 1,2 and 3. Consult department. By arrangement.
Mechanical and Aeronautical Engineering Science 2	16	 Lectures MEng2 Practical M Eng2 Lecture M DeslA Practical M DeslA	 SI S2 SI S2		 11 0:6)	 11 11	 (2-5) (2-5) (2-5)	 11 11 (2-5) (2-5)	 10	This course is equivalent to U2.410(Mechanical Engineering 2), and either U2.441(Mecanical Design 1A)orbothU2.440 (Mechanical Design 1 Part Course) and U2.501(Basic Electrical Engineering 2). One 3-hour practical each week will be allocated. Semester 2 only. Semester 2 only. One 3-hour practical each week will be allocated.
Microbiology 2	16	Lectures Practical			2 (3-5)	11 Semi: (3-5) Sem2: (2-4)	 (2-5)	11 (2-5)		 Students attend either Monday and Wednesday or Tuesday and Thursday. Consult the department in Orientation week.
Microbiology 2 (Theory & Techniques) Auxiliary (SI)	; 8	Lectures Practical			2 (3-5)	11 Semi: (3-5) Sem2: (2-4)	 (2-5)	.11 (2-5)		 Students attend either Monday and Wednesday or Tuesday and Thursday. Classes will be allocated.
Microbiology 2 (Theory) Auxiliary (A)	:▪" 8	Lectures			2	11		11		
Pharmacology 2 Introductory(A)	8	Lectures Practical		 .*		10 (11-5)		10 (11-5)		 Nine 6-hour periods during the year to be arranged.
Physics 2	; 16 -	Lectures Practical Microlab		 * *	 (2-4) (3-5)	10,3 (2-4)	12 ; (2-6) (2-4)	10 (2-6)	 (2-6)	Tuesday 3 for part of the year only. One 4-hour period to be assigned. One 2-hour period to be -.' assigned.
Physiology 2 Auxiliary (A)	,8	Lectures Tutorial		 »	8	 (9)	8	 (11)	8	 One hour to be assigned
Psychology 2	16	Lectures Tutorials	Ser1 Ser2		1 5.15	12 5.15	1 5.15	12 5.15		One series to be chosen To be arranged.
Soil Science 2 :	16	Lectures SI S2 Tut/dem			9	' 10 10	9 11	10,2	9 12 or 2	 Semester 1 only.

Table 2 ***(continued)***

Course	Units	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Soil Science 2 *(continued)*		Practical SI S2		*	(2-5)	(2-5)			(2-5)	
Soil Science 2 Auxiliary (SI)	8	Lectures Tut/dem Practical		*	9 (2-5)	10 (2-5)	9		9 12 or 2	
Statistical Methods 2 (SI)	8	Lectures Tutorial Computer practical					11	11,1	1	Two one-hour tutorials per week. One hour per week.
Statistical Methods 2 Advanced (S2)	8	Lectures Tutorial Computer practical					11	11,1	1	Two one-hour tutorials per week. Two one-hour practicals per week.

Table 3

Timetable for Senior courses

Unless otherwise indicated the timetables for advanced courses are the same as those for the ordinary courses.

Science/Law students should also consult table 4.

Unless otherwise indicated in the notes classes for all courses are held throughout the year.

Alternative times are indicated by an entry in the 'Alt' column. An asterisk (*) in this column indicates that there is some degree of choice among the times that follow. Rules for selecting from the times are given in the 'Notes' column.

Course	Classes	**Option** or Series	**Alt**	**Mon**	**Tue**	**Wed**	**Thu**	Fri	Notes
Agricultural Chemistry 3	Lectures			9	9*	9		9	*Semester 1 only.
	Practical		*	(10-5)	(2-5)	(2-5)	(2-5)	(2-5)	Eght hours practical per week in Sem 1. Nine hours practical per week in Sem 2.
Biochemistry 3	Lectures			9	9	9		9	
	Practical	1 2	*	(10-5)	(10-5)	(10-5)	(10-5)		Eght hours practical work on average. Classes start at 10am Monday (Option 1) or Wednesday (Option 2) and carry on into the following day.
Biology 3 (Timetable 1) (Cell Biology & Physiology Options)	Lectures	110,111 112,210		10	10		10	10	
	Practical	211,212				10-2		2-6	
Biology 3 (Timetable 2) (Diversity, Ecology, Entomology & Evolution Options)	Lectures	120,121, 122,123,		11	11		11	11	
	Practical	124,125, 220,221, 222,223				2-6	2-6		
Biology 3 (Timetable 3) (Genetics & Molecular Options)	Lectures	130 230		12 12	12		9,12 12	1 12	Semester 1 only. Semester 2 only
	Practical			2-6	2-6				
Cell Pathology 3	Lectures					1			Intending students should consult the Department of Pathology.
	Practical					(2-5)	(9-5)		
Chemistry 3	Lectures	Compulsory			10	10	10 10		Semester 1 only Semester 2 only
		Various options		10, 11,12	10,11, 12	10,11,	9,10, 11,12	10,11 12	Refer to the School of Chemistry for information on options.
	Practical		*		(12-5)	(12-5)	(12-5)	(12-5)	Eght hours per week. Choose any eight.
	Tutorial			(2-5)					Eght two-hour tutorials in weeks 7-14 of Semester 1.
Chemistry 3 Additional	Lectures	Compulsory		10	10				Semester 1 only Semester 2 only
		Various options		10, 11,12	11,12	10,11	9,10, 11,12	10,11	Refer to the School of Chemistry for information on options.
	Practical		*		(12-5)	(12-5)	(12-5)	(12-5)	Eght hours per week. Choose any eight.
	Tutorial			(2-5)					Eght two-hour tutorials in weeks 7-14 of Semester 1.
Computer Science 3	Lectures	a b c d e f g h			12 2 10 11 9 (4)	9 3 10,2 4	 4 10 2 9		Consult department for details.
	Practical								Consult department.

Table 3 *(continued)*

Course	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Computer Science 3 Additional									Consult department for details.
Geography 3 Geo. Geography 3 Human Geography 3 Environ.	Lectures Practical / tutorials			9	9,10, 12,1, 4	9,10, 12,1, 4	10, 12,1, 4		Timetable depends on option selected. Consult the department. Practical assignment and tutorial to be arranged. Attendance at one tutorial compulsory.
Geology 3	Lectures Practical			9 (2-5)		9 (2-5)		9 (2-5)	
Geology 3 (Additional)									A total of 12 hours contact teaching per week. Consult department.
Geophysics 3									A total of 12 hours contact teaching per week. Consult department.
History and Philosophy of Science 3	Lecture Seminar	Physical Biological Social			10 (5.15-7.15)	2	2 10 (5.15-7.15)		Semester 1 Semester 1 Semesters 1 and 2. Semesters 1 and 2. Two 1-hour tutorials in Semester 1. Two 2-hour options or equivalent in Semester 2, by arrangement. Consult department.
Marine Sciences 3									Timetable depends on options chosen. Refer to pamphlet available from Dept of Geology and Geophysics.
Applied Mathematics 3 & Applied Mathematics 3 Advanced	Lectures Tutorials	a b c d		4 10 12	 11		11 2	 2 3	Students attend 3 options per semester. Consult the School for details. By arrangement.
Mathematical Statistics 3 & Mathematical Statistics 3 Advanced	Lectures Tutorials Practical			9,11	10	11	10,11	 (9-12)	Advanced students will have an extra two probability theory lectures per week in Semester 2. Two 1-hour tutorials per week to be arranged.
Pure Mathematics 3 &Pure Mathematics 3 Advanced	Lectures	a b c d e Evening		 2 3 12 5.15 6.15	3 9 5.15 6.15	 12 5.15 6.15	 12 3 9	12	Students will take three or four options per semester. Consult the School for details.
Microbiology 3	Lectures Practical			10	10	10 (11-1), (2-5)	 (2-5)	10	
Pharmacology 3	Lectures Semi Sem2 Practical Tutorial			 12	 8 11	 11 11	 9 9 (10-5)	 11	 Consult department before enrolling. By arrangement.

Table 3 *(continued)*

Course	Classes	Option or Series	Alt	Mon	Tue	Wed	Thu	Fri	Notes
Physics 3	Lectures	Sem 1 Sem 2 Core Sem 2 Options	 *	9,11 (9)(11)	 (10)	11 11 	 (10)	9 (9X11)	Semester 1 5 lectures per week in Sem 2
	Experi-mental		*		(9-5)	(9-5)	(9-5)	(9-5)	Attend 6 hours per week in Semester 1 & 7 hours per week in Semester 2 on Tuesday and Wednesday or Thursday and Friday.
	Compu-tational							10-12	Semester 1 only
Psychology 3	Lectures	Day		10,4	3,4	3,4	10,2, - 3,4	2	Four lectures per week in accordance with the chosen options.
		Evening		5.15	5.15, 6.15	5.15, 6.15	5.15	5.15	Some options will not be available at the times listed here.
	Tutorials								Also four to six tutorial hours per week. Consult the department.
Soil Science 3	Lectures			12		12	11		
	Practical	V.							Eight hours per week by arrangement.
	Tutorial								One tutorial per week by arrangement.

Table 4

Timetable for Law courses

The courses in this table are available only to students enrolled concurrently for the degrees of Bachelor of Science and Bachelor of Laws.

Junior year candidates take Legal Institutions.

Intermediate year candidates normally enrol in Constitutional Law, Torts and Criminal Law.

Senior year candidates normally enrol in Administrative Law, Contracts and, if not completed, Criminal Law.

Course	Units	Classes	Mon	Tue	Wed	Thu	Fri
Legal Institutions	**12**	Lectures	9		9		9
Constitutional Law .	**6**	Lectures	12				12
Criminal Law	6 ■	Lectures	9 or 10				9 or 10
Torts	**6**	Lectures	11				11
Administrative Law	**6**	Lectures	**12**				12
Contracts	**6**	Lectures	11				**11**

Table 5

Timetable for Bachelor of Medical Science courses

The courses in this table are available only to students enrolled for the first year in the degree of Bachelor of Medical Science.

An individual timetable for students enrolled in these courses will be issued during the orientation period in Carslaw Lecture Room 3A at the times listed at the beginning of the timetable section.

Course	Classes	**Mon**	**Tue**	**Wed**	**Thu**	Fri	**Notes**
Human Life Sciences 2	Lectures	9,12	9	9	9	9	
	Practical	(2-5)"	(12-6)*	(12-6)*		(2-5)**	*Srudents will be allocated to either the Tuesday or Wednesday group. Tutorials on lectures and/or practical work will be held during the first hour of the period and at other times to be arranged. **In some weeks a lecture or tutorial related to the practical class will be presented in the first hour of this period.
Pharmacology 2 Introductory	Lectures		10		10		
	Practical		(11-5)		(11-5)		Students will be allocated to either the Tuesday or Thursday group, and will do nine 6-hour pracricals during the year.
Biochemistry 2 (Medical Science) Auxiliary	Lectures	10		10		**10**	
Biochemistry 2 (Medical Science) Practical	Practical		(11-5)	(11-5)	(1-6)		To be allocated.
Biology 2 (Molecular and General Genetics) Auxiliary	Lectures	11		12		11	
	Practical			(2-6)	(1-5)		To be allocated.
	Tutorial						One hour per week to be arranged.
History and Philosophy of Science 2 Introductory	Lectures	5.15		5.15			
	Tutorial						One hour per week to be arranged.

Table 6

Timetable for Bachelor of Medical Science courses

The courses in this table are available only to students enrolled for the second year of the degree of Bachelor of Medical Science.

Course	Classes	Mon	Tue	Wed	Thu	Fri	Notes
Human Life) Sciences 3 (Cellular and Molecular)	Lecture	11					Semester 1 core course.
	Problem groups	12			9		Group 1.
			9			9	Group 2.
	Tutorial						One tutorial per week by arrangement.
Microbiology and Immunology 3	Lectures	10	10	10		8	Semester 1 core course.
	Practical		(11-2)			(10-1)	
Anatomy 3 (Topographical)	Lectures	10	2	8			Semester 2 only.
	Dissection		(11-1)				
	Practical	(2-5)	(3-5)		(2-5)	(9-11)	The Monday session is repeated on Thursday; students attend one or the other.
Biochemistry 3 (Molecular Biology and Metabolism)	Lectures	9	9	9		9	Semester 1 only
	Practical			(11-5)	(10-5)		Eight hours practical work on average.
Biochemistry 3 (Physical and Macromolecular)	Lectures	9	9	9		9	Semester 2 only.
	Practical	(10-5)	(10-5)	(10-5)	(10-5)		Eight hours practical work on average. Classes start at 10am Monday (Option 1) or 10am Wednesday (Option 2) and carry on into the following day.
Biology 3 (Molecular Generics and Recombinant DNA Technology)	Lectures	12			9,12	2	Semester 1 only.
	Practical	(2-6)	(2-6)				
Biology 3 (Human, Developmental and Evolutionary Genetics)	Lectures	12	12		9	12	Semester 2 only.
	Practical	(2-6)	(2-6)				
Cell Pathology 3	Lectures			1			Whole year course. Intending students should consult the Department of Pathology.
	Practical			(2-5)	(9-5)		
Histology 3 (Techniques)	Lectures			11,12	9,10		Semester 1 only.
	Practical			(2-5)	(11-5)		
Histplogy3 (Developmental Biology)	Lectures			11,12	9,10		Semester 2 only.
	Practical			(2-5)	(11-5)		
History of the Life Sciences	Lectures				5.15, 6.15		Semester 1 only. Timetable for seminars and other lectures by arrangement.
Immunology 3	Lectures	12	8	9			Semester 2 only.
	Practical	(2-6)			(9-1)		
	Tutorial						One tutorial per week by arrangement.
Infectious Diseases 3 (Infection and Diagnosis)	Lectures	9	9	8 .	8		Semester 2 only. Intending students should consult the Department of Infectious Diseases.
	Practical			(2.6)	(2.6)		
Microbiology 3 (Molecular Biology of Pathogens)	Lectures	10	10	10		10	Semester 2 only.
	Practical		(1-5)			(1-5)	
Neuroscience 3	Lectures	12		8,9	9	2	Semester 1 only.
	Seminars					3-5	
	Practical	2-5		2-4			

Table 6 *(continued)*

Course	Classes	**Mon**	**Tue**	**Wed**	**Thu**	Fri	Notes
Neurosrience 3 (Advanced)	Lectures		10		8	8	Semester 2 only. Timetable for practical work will be by arrangement.
	Seminars			2-4	2-4		
Pharmacology 3 (Molecular Pharmacology and Toxicology)	Lectures	12	8	11	9		Semester 1 only.
	Practical				10-5		
	Tutorial						One tutorial per week by arrangement.
Pharmacology 3 (Neuro- and Cardiovascular)	Lectures		11	11	9	11	Semester 2 only.
	Practical				10-5		One tutorial per week by arrangement. Practical work may be at other times — students should consult the department.
Physiology 3 (Heart and Circulation)	Lectures	11		10		12,2	Semester 2 only.
	Seminars					3-5	
	Practical	(12-6)		(12-6)			Students will be allocated to either the Monday or Wednesday practical group.

Appendix: Explanation of symbols for courses of study

Symbols may have been used in the courses of study chapter in the handbook as a succinct way of presenting teaching and assessment information. Because of the varied nature of the work described and occasional difficulties in interpretation and typesetting, such details are not construed as a firm undertaking. Students are advised to check details with the departments concerned. The significance of symbols used is as follows:

Hypothetical examples of symbols used

Title of course	**Double Dutch 1**
Actual lecturers	Assoc. Prof. Holland Dr Nederlands
Allied studies	*AKn* HSC German
Class contact & course duration	*Classes* Yr: (3 lec & 1 tut)/wk
Exams, essays, etc.	*Assessment* one 3hr exam, two 2000w essays/sem, 4 tut papers/sem
Title of course	**8766 Star Wars 5**
Actual lecturers	Dr Lazer Ms Gunn
Allied studies	*Prereq* 7653 *Coreq* Intro. Media Manipulation
Class contact & course duration	*Classes* Sem 1: (2 lec & 3 tut/prac)/wk; Sem 2: (2 lec & 2 tut/prac)/wk
Exams, essays, etc.	*Assessment* one 3hr exam/sem, classwork

Allied studies

AKn	assumed knowledge
Prereq	prerequisite (you must have passed the indicated prerequisite before you start the course)
Coreq	corequisite (you must enrol in this course at the same time unless you have already passed it)

Type of class contact/assessment

class	class contact of any form
lab	laboratory
lec	lecture
prac	practical
tut	tutorial
exam	examination
tut paper	tutorial paper

Duration

hr	hour
Sem 1	Semester 1
Sem 2	Semester 2
Yr	throughout the year

Frequency

/wk	per week
/fn	per fortnight
/sem	per semester
/yr	per year

Examples

Classes

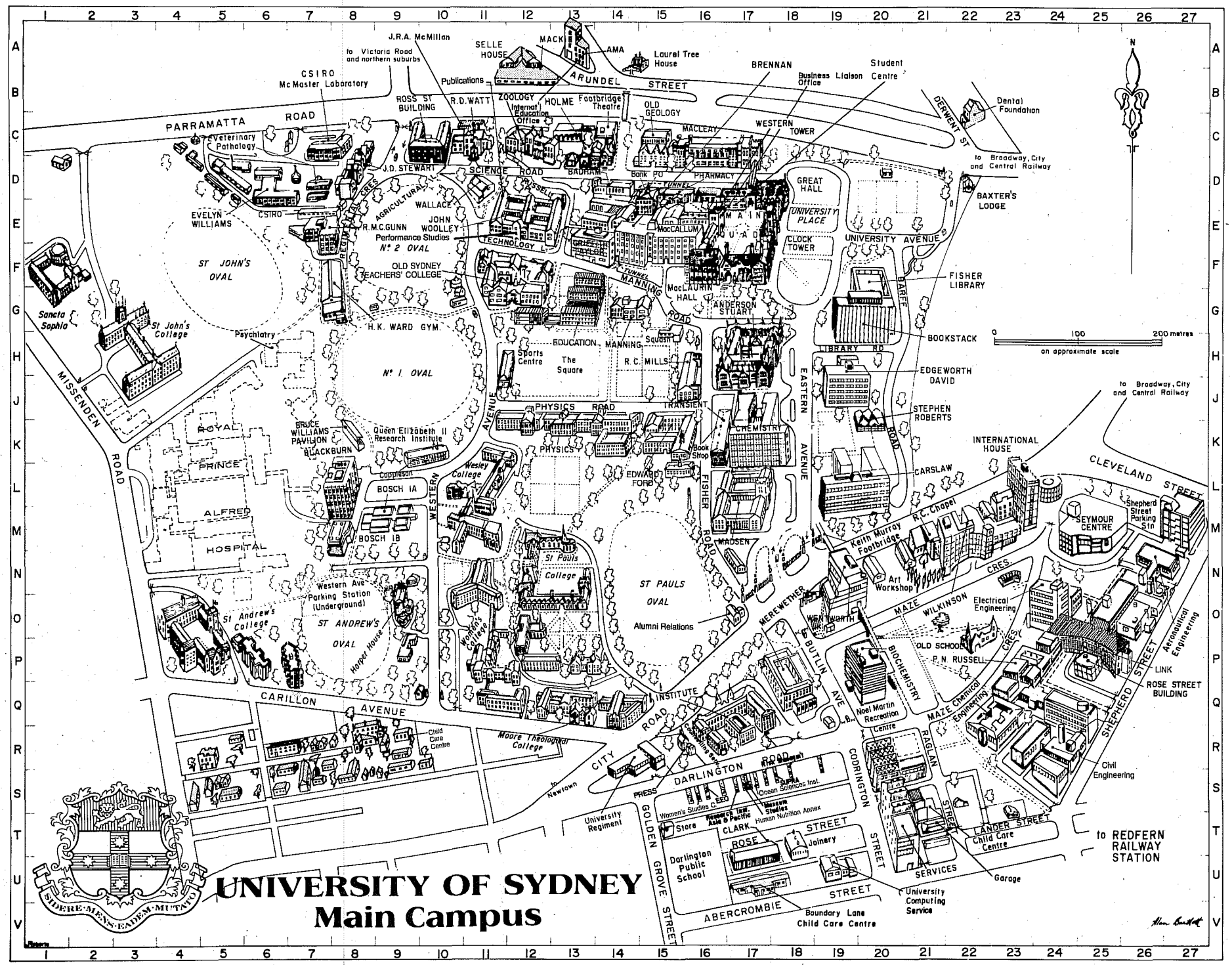
Sem 1:1 class/wk	one class work session each week during Semester 1
Yr: (2 lec & 3 tut/prac)/wk	two lectures and three tutorials or practicals weekly, throughout the year
Sem 2: 3 lec/wk & 1 tut/fn	three lectures per week and one tutorial per fortnight, during Semester 2

Assessment

one 3hr exam	one 3-hour exam
two 3hr exams/sem	two 3-hour exams per semester
one 2000w essay	one 2000-word essay
one 3000w essay, two 2000w essays/sem, 4 tut papers	one 3000-word essay for the course, two 2000-word essays per semester and four tutorial papers for the course
(one 3000w & two 2000w essays)/sem	one 3000- and two 2000-word essays per semester

Buildings, departments and operations (main campus)

13G Accommodation Service A35
16S Accounting H51
16E Admin. Policy & Strategic Planning Division A14
17D Admin. Support Services Division A14
17D Admissions A14
26N Aeronautical Engineering J07
U C Agricultural Annexe A07
ioc Agricultural Chemistry & Soil Science A03
11C Agricultural Economics A04
11C Agricultural Glasshouses A06
l i e Agriculture Faculty Office A05
23N Alma Street Glasshouse G07
170 Alumni Relations F18
17H Anderson Stuart Building F13
17H Anatomy & Histology F13
7E Animal Science Bl9
16F Anthropology A14
16S ANZAAS H44
16F Archaeology, Classics & Ancient History A14
22M Architectural & Design Science G04
22M Architecture, Dept & Faculty Office G04
20G Archives F04
20N Art Workshop G03
16E Arts Faculty Office A14
14F Asian Studies A18
170 Attendant's Lodge F18
14D Badham Building & Library A16
Banks
19N Advance G01
13C Commonwealth A09
19N Commonwealth G01
15D National Australia A15
19N National Australia G01
22D Baxter's Lodge F02
8L Behav. Sciences in Medicine D06
20P Biochemistry G08
12C Biological Sciences, Zoology A08
16C Biological Science, Botany A12
8L Blackburn Building D06
16K Bookshop F12
8L Bookshop, Medical D06
19N Bookshop SRC Secondhand G01
8M Bosch Building D05
9M Bosch Lectu re Theatres D04
16C Botany A12
14F Brennan, C, Building A18
17H Burkitt Library F13
17E Business Liaison Office A14
12A Careers & Appts Service KOI
6C Caretaker's Cottage (Vet. area) B03
19L Carslaw Building F07
16D Cashier A14
15E Celtic Studies A17
21S Central Stores G12
19L Centre for Teach & Learning F07
17D Chancellor's Committee Shop A14
10G Chaplains, University D1l
23Q Chemical Engineering J01
21S Chemical Store Gil
17K Chemistry Fll
Child Care
17U Boundary Lane
9R Carillon Avenue
14A Laurel Tree House (Glebe) K05
21S Union (Darlington) G10
24R Civil Engineering J05
17T Clark Building H12
17E Clock Tower A14
17L Computer Science, Basser Dept F09
12A Continuing,Education KOI
9K Coppleson Postgrad. Med. Inst. D02
13G Counselling Service, University A35
14C Credit Union A09
12E Crop Sciences A20
U C Agricultural Entomology A04
U C Agricultural Genetics & Plant Breeding A04
12E Agronomy A20
IOC Biometry A03
12E Horticulture A20
U C Plant Pathology A04
7C CSIRO McMaster Laboratory B02
7E —, Annexe B14
22B Dental H. Educ. & Res. Fndn K03
16K Dentistry Faculty Office A27
18Q Econometrics H04
18Q Economic History H04
18P Economics H04
18P Economics Faculty Office H04
19J Edgeworth David Building F05
13G Education A35
15K Edward Ford Building A27
24P Electrical Engineering J03
17L Electron Microscope Unit F09
23Q Engineering Faculty Office J02
24S Engineering Workshop J06
12E English A20
16S Equal Employment Opportunity H47
6D Evelyn Williams Building BIO
8L Experimental Medicine D06
17D External Relations Division A14
17D Financial Services Division A14
16H Fine Arts A26
20F Fisher Library F03
14C Footbridge Theatre A09
14E Found Property A19
14F French Studies A18
21T Garage, University G13
17Q Geography H03
19J Geology & Geophysics F05
14F Germanic Studies A18
18Q Govt & Public Admin H04
8K Grandstand No. 1 Oval D01
18D Great Hall A14
17E Greek—Ancient A14
13F Greek—Modern A19
13 F Griffith Taylor Building A19
7E Gunn, R.M.C., Building B19
Health Service, University
13C Holme Building A09
19N Wentworth Building G01
15F History A17
17K History & Philosophy of Science Fll
13C Holme Building A09
SD Horse Stables B09
20P Human Nutrition Unit G08
17Q Industrial Relations H03
8L Infectious Diseases D06
19U Information Services HOB
17Q Institute Building H03
17Q Internal Auditor H03
13D International Education Office K07
23L International House G06
4D Isolation Block—large animal bull pen B05
16H Italian Studies A26
18T joinery G12
12F Koori Centre A22
13F Language Centre A19
17E Latin A14
13G Learning Assistance Centre A35
16K Linguistics F12
2SO Link Building J13
12A Mackie Building KOI
16F MacLaurin HallA14
16C Macleay Building A12
16C Macleay Museum A12
7C McMaster Laboratory CSIRO B02
11C McMillan, J.R.A., Building A05
17L Madsen Building F09
15C Mail Room (Internal) A1l
17E Main Building A14
14G Manning House A23
13A Margaret Telfer Building K07
16K Mathematics Learning Centre F12
19L Mathematics & Statistics F07
26N Median. & Aero. Eng Bdg J07
250 Mechanical Engineering J07
15K Medicine Faculty Office A27
8L Med., Paradinical & Clinical D06
17H Medidne, Preclinical F13
18P Merewether Building H04
20P Microbiology G08
16H Mills, R.C., Building A26
14Q Moore Theological College 1
15F Mungo MacCallum Building A17
17S Museum Studies H36
24M Music J09
16F Nicholson Museum A14
10K Obstetrics & Gynaecology D02
17S Ocean Sciences Institute H34
ISC Old Geology Building A1l
220 Old SchoolBuilding G15
12F Old Teachers' College Building A22
8L Pathology & Path Museum D06
12E Performance Studies A20
13A Personnel Services K07
8L Pharmacology D06
15D Pharmacy A15
17F Philosophy A14
16K Phonetics Laboratory F12
21T Photography G12
13K Physics A28
17H Physiology F13
10K Postgraduate C'ttee in Medicine D02
15D Post Office A15
16R Press Building H02
21T Printing Service G12
16E Professorial Board Room A14
13A Properties Office K07
6H Psychiatry D06
1SF Psychology A17
11D Publications A20
15K Public Health A27
17E Quadrangle A14
10K Queen Elizabeth II Res. Inst. D02
16D Records A14
15R Regiment, University HOI
13F Religion, School of Studies in A19
17S Research Institute for Asia & the Pacific H40
18S Risk Management H31
25P Rose Street Building J04
IOC Ross Street Building A03
7D Round House BU
23P Russell, Peter Nicol, Building J02
16K SAUT F12
5P St Andrew's College 2
3H St John's College 3
21M St Michael's College
12N St Paul's College 4
IF Sancta Sophia College 5
4C Sand roll shed B04
19 L Science Faculty Office F07
14E Security A19
12A Selle House K02
18E Semitic Studies A14
18E Senate Room A14
21T Services Building G12
25M Seymour Theatre Centre J09
5D Sheep Building & Pens B07
17H Shellshear Museum F13
21S Shepherd Centre G10
27M Shepherd St Parking Station J10
16H Sorial Work A26
Sports
20R Noel Martin Recreation Centre, Darlington G09
12H Sports Centre Western Ave A30
7F Sports Union DOS
7F Ward, H.K., Gymnasium D08
20J Stephen Roberts Theatre F06
8D Stewart, J.D., Building B01
17L Student Centre F09
19N SRC G01
21T Supply Department G12
7Q8S SUPRA H28
8L Surgery D06
20R Swimming Pool G09
20D Tennis pav. & women's courts FOI
14E Traffic Office A19
16K Transient Building F12.
19N Union, University of Sydney G01
15F University of Sydney Club A17
22M Urban & Regional Planning G04
8D Vet. Anatomy B01
6D Vet. Clinic, hospital, surgery BIO
6D Vet. Clinical Sdences BIO
7D Vet. Operating theatre & animal house B13
7D Vet. Pathology B12
7E Vet. Physiology B19
8D Vet. Science, Faculty Office B01
16E Vice-Chancellor A14
11D Wallace Theatre A21
17D War Memorial Gallery A14
250 Warren Centre for Adv. Engin. J07
11C Watt, R.D., Building A04
17L Welfare Assodation F09
19N Wentworth Building G01
11L Wesley College 6
8N Western Avenue Underground Parking Station D07
16E Western Tower A14
22M Wilkinson Building G04
17H Wilson (Anatomy) Museum F13
H O Women's College 7
12H Women's Sports Association
16S Women's Studies Centre H53
12E Woolley Building A20
17D Yeoman Bedell A14
12C Zoology A08


UNIVERSITY OF SYDNEY
Main Campus
SIDERE·MENS·EADEM·MUTATO
PARRAMATTA ROAD
ARUNDEL STREET
SCIENCE ROAD
CARILLON AVENUE
MISSENDEN ROAD
CLEVELAND STREET
DARLINGTON ROAD
ABERCROMBIE STREET
GOLDEN GROVE STREET
UNIVERSITY AVENUE
MAIN QUAD
ST JOHN'S OVAL
No 1 OVAL
No 2 OVAL
ST ANDREW'S OVAL
ST PAULS OVAL
ROYAL PRINCE ALFRED HOSPITAL
BOSCH IA
BOSCH IB
BRUCE WILLIAMS PAVILION
BLACKBURN
H.K. WARD GYM
Sports Centre
The Square
R.C. MILLS
MANNING
EDUCATION
PHYSICS
CHEMISTRY
MADSEN
EDWARD FORD
FISHER LIBRARY
BOOKSTACK
EDGEWORTH DAVID
STEPHEN ROBERTS
CARSLAW
INTERNATIONAL HOUSE
SEYMOUR CENTRE
Shepherd Street Parking Stn
R.C. Chapel
Keith Murray Footbridge
Art Workshop
Electrical Engineering
Aeronautical Engineering
ROSE STREET BUILDING
Civil Engineering
Noel Martin Recreation Centre
BIOCHEMISTRY
MAZE Chemical Engineering
OLD SCHOOL
P.N. RUSSELL
WILKINSON
MAZE
MEREWETHER
BUTLIN
WENTWORTH
CODRINGTON
RAGLAN
LANDER STREET
Child Care Centre
SERVICES
Garage
University Computing Service
Boundary Lane Child Care Centre
Darlington Public School
CLARK
ROSE
Joinery
Store
Women's Studies C.
Ocean Sciences Inst.
Human Nutrition Annex
Moore Theological College
Child Care Centre
University Regiment
to Newtown
to REDFERN RAILWAY STATION
to Broadway, City and Central Railway
Dental Foundation
BAXTER'S LODGE
GREAT HALL
UNIVERSITY PLACE
CLOCK TOWER
MacCALLUM
MacLAURIN HALL
ANDERSON STUART
MANNING
LIBRARY RD
BARFF
EASTERN AVENUE
WESTERN AVENUE
FISHER ROAD
INSTITUTE BUILDING
Footbridge Theatre
ZOOLOGY
HOLME
R.D. WATT
ROSS ST BUILDING
MACLEAY
OLD GEOLOGY
WESTERN TOWER
Student Centre
Business Liaison Office
Laurel Tree House
AMA
MACK
SELLE HOUSE
Publications
CSIRO Mc Master Laboratory
to Victoria Road and northern suburbs
J.R.A. McMillan
Veterinary Pathology
CSIRO
EVELYN WILLIAMS
R.M.C. GUNN
JOHN WOOLLEY
J.D. STEWART
WALLACE
AGRICULTURAL
RECEIVING
Sancta Sophia
St John's College
Psychiatry
Queen Elizabeth II Research Institute
Wesley College
St Pauls College
St Andrew's College
Women's College
Harper House
Western Ave Parking Station (Underground)
Alumni Relations
Coppleson
Book Shop
TRANSIENT
Squash
0 100 200 metres
an approximate scale
N