VICTORIAN COLLEGE OF PHARMACY HANDBOOK 1993

Monash University
Coat of Arms The Coat of Arms of the university is described as follows:

‘Azure a Chevron Argent between in chief an open book proper bound clasped and edged Or and a Sword environed by a Laurel Wreath Gold and in base a representation of the Southern Cross also Argent.’

The devices on the shield arise as follows: the open book is commonly found on the shields of universities and learned societies and symbolises the pursuit of knowledge, the stars of the Southern Cross are of course appropriate for our geographical position, and the wreath and sword are a quotation from the shield of Sir John Monash. The motto ‘Ancora Imparo’ is said to have been a saying of Michaelangelo and means ‘I am still learning’.

Monash University faculty and college handbooks The university publishes these handbooks for each of its faculties in December of the previous year. They list in full the names of the faculty’s officers and staff, provide outlines of studies and details of subjects. Inquiries concerning the Pharmacy handbook should be directed to the Pharmacy College.

Student information handbook Published in December of the previous year, the Student information handbook contains information about the university’s officers and staff other than in the faculties, services and resources available to students, regulations, enrolment information, and principal dates for the year at hand.

Calendar A full listing of the university’s officers and staff, and the most recent version of all the Acts, statutes, regulations and schedules pertaining to the university may be found in the loose-leaf bound Calendar, copies of which are available at each department and through the student associations and the university’s careers advisers. This is published in January and updated as required throughout the year.

Caution This handbook provides, in good faith, a guide to courses available in 1993, and the information contained within it is accurate as at 23 October 1992. The handbooks cannot hope to cover all of the various options available adequately, although they attempt to be as accurate as possible. Students should always check with the relevant faculty officers in planning their courses. The handbooks also include descriptions of courses which may be altered later or include courses which may in fact not be offered due to insufficient enrolments or changes in teaching personnel.

The fact that details of a course are included in the handbooks can in no way be taken as creating an obligation on the part of the university or faculty to teach it in any given year, or to teach it in the manner described. The university reserves the right to discontinue or vary courses at any time without notice.
CONTENTS

Principal Dates 1993 ..................................................................................................................... 4
Mission and Objectives ................................................................................................................ 5
Officers and Staff .......................................................................................................................... 8
Victorian College of Pharmacy .................................................................................................. 13
Entry Requirements .................................................................................................................... 17
Aims and Objectives of Bachelor of Pharmacy Course .......................................................... 18
Curriculum ................................................................................................................................ 20
Council's Policy concerning Courses of Study ..................................................................... 20
Fees, HECS ................................................................................................................................ 22
Allowances ................................................................................................................................ 22
Special Assistance for Students, RACI Membership .............................................................. 23
Details of Subjects
  First Year .................................................................................................................................. 24
  Second Year ............................................................................................................................... 43
  Third Year ................................................................................................................................ 62
Practical Training and Final Examination .............................................................................. 73
Graduate Faculty ......................................................................................................................... 77
  Research .................................................................................................................................. 77
  Graduate Diploma in Hospital Pharmacy ............................................................................... 78
  Master of Pharmacy .................................................................................................................. 81
  Doctor of Philosophy ................................................................................................................. 82
Victorian Pharmacy Students Association ............................................................................... 84
Student Counselling ................................................................................................................... 84
C L Butchers Memorial Library ................................................................................................. 84
Library Rules ............................................................................................................................... 85
Sponsorships ................................................................................................................................. 86
Exhibitions and Awards ............................................................................................................... 88
College Rules ............................................................................................................................... 89
Examinations ................................................................................................................................. 91
Examination Rules ....................................................................................................................... 92
PRINCIPAL DATES 1993

January 4 College re-opens after Christmas
February 1 Australia Day holiday — College closed
25 First semester begins (first year students only)
March 1 First semester begins (second and third year students)
8 Labour Day — College open, lectures continue
10 Opening Address and Prize-giving
April 9 Good Friday — College closed
19 Lectures resume after Easter recess
May 11 Conferring of Degrees
17 Non-teaching period (first year students only)
20 Progress Examinations begin
24 Lectures resume after non-teaching period (first year students only)
24 Pharmacy III Examination begins
24 Final Examination begins
June 14 Queen’s Birthday — College open, lectures continue
18 First semester ends
23 Pharmacy II Biochemistry Examination
24 Pharmacy III Forensic Pharmacy Examination
28 Pharmacy II Mid-Year Examinations begin
30 Pharmacy II Mid-Year Examinations end
July 19 Second semester begins
30 Last date of entry for Pharmacy I, II and III Examinations
September 21 Applications for admission to Bachelor of Pharmacy course
1994 close with VTAC
23 Show Day — College open
27 Non-teaching period
October 1 Last day of entry for Final Examination
4 Lectures resume after non-teaching period
15 Second semester ends
25 Pharmacy I, II and III Examinations begin
25 Final Examination begins
November 2 Cup Day — College open
8 Pharmacy I, II and III Examinations end
8 Last day for return of locker keys and removal of apparatus
30 Applications for admission to Graduate Diploma in Hospital Pharmacy course close
December 6 Supplementary examinations begin
MISSION AND OBJECTIVES

1 Mission statement
The mission of the College is:
To foster the advancement of knowledge and understanding of the pharmaceutic al sciences, and to achieve standards of excellence in teaching and research in those areas.
To ensure that the quality and number of College graduates satisfy community needs.
To provide an environment for its students that will encourage them to develop an attitude to learning that will continue throughout their professional career.
In conjunction with the Pharmaceutical Society of Australia (Victorian Branch) Ltd, to provide continuing education programmes directed towards enabling pharmacists in all areas of professional practice to keep abreast of the developments in pharmaceutical science to meet the needs of the community.
To interact and co-operate effectively with other educational institutions, governments and their instrumentalities, industry, professional associations, and other sections of the community for the benefit of the community.

2 Objectives
To ensure the achievement of its mission the Victorian College of Pharmacy will strive to achieve the following objectives.

2.1 Excellence in teaching
To provide the stimulus and facilities for the development of teaching skills, and the appropriate resources for assessment and development of staff to achieve those standards.
To maintain a high level of professional practice through the provision of continuing education programmes designed to meet the particular needs of the generalist and specialist branches of the profession.

2.2 Excellence in research
To encourage the participation of graduates in pharmacy and science in the post-graduate research degrees offered by the College, in order to ensure the on-going provision of highly skilled, well educated research and development scientists.
To maintain and expand the research function of the College through collaboration with established industrial research groups, and to foster the development of Australian based research in the pharmaceutical and medical sciences.
To ensure that the College is able to continue to acquire and maintain major items of scientific equipment, and expertise in scientific techniques, and thus remain in the forefront of research in the pharmaceutical sciences.
To act as a research resource centre for industry and research institutes involved in the pharmaceutical and medical sciences.

2.3 **Students**

To continue to attract highly qualified and motivated students, and at the same time maintain an equitable admission policy.

To develop means of identifying disadvantaged students and provide appropriate assistance.

To provide bridging/summer-school/refresher courses to meet the needs of students seeking entry to the under-graduate or post-graduate schools, and for those overseas-qualified immigrant pharmacists seeking registration to practise in Australia.

To develop specialist post-graduate courses in pharmacy and the related sciences to meet the needs of the community.

2.4 **Staff**

To develop an attitude of cohesion and co-operation in order to ensure that the staff work together to provide the most effective and efficient education for pharmacy students within the severe time constraints that are imposed.

To encourage an attitude of commitment to the College and the profession, and to recognise and reward excellence in teaching, research, administration, and professional involvement, appropriately.

2.5 **Management and accountability**

To continue to develop ways and means to increase income from other than government sources, while maintaining the right to fair and equitable support from government.

To improve efficiency and effectiveness through further devolution of responsibilities to senior staff.

To provide senior staff with the means to gain access to development programmes to assist them with their managerial responsibilities.

To be constantly aware of its accountability to the community and the profession of pharmacy.

To develop appropriate measures to evaluate efficiency and effectiveness in teaching, research and administration.

2.6 **External links**

To continue to develop the currently productive links with the profession, industry, and government instrumentalities; to maintain the close association that exists with overseas universities and research organisations, and to ensure the ongoing international recognition of the Victorian College of Pharmacy as one of the pre-eminent pharmacy schools in the Western world.
2.7 **Equal opportunity**

As an employer and an educator the College accepts that it has a responsibility to eliminate and ensure the continued absence within its structures and practices of any source of direct or indirect discrimination on the basis of sex, race (including colour, national or ethnic origin), marital status, pregnancy, parenthood, age, sexual preference, disability or impairment (including the presence in the body of organisms causing disease), religious or political conviction.

It is the policy of the College to promote equal opportunity for all persons including women (refer Affirmative Action Statement), Aboriginals and members of racial and ethnic minorities.
OFFICERS AND STAFF

Officers of the faculty
Dean and Director
Colin Burton Chapman BPharm VIC BVSc PhD Melb. MPS MACPP

Deputy Director
Robert Burnet BA Melb. MBA Melb. FPS (HON) MAITEA FAIPM

Business Manager
Neil John Sutton BBus RMIT AASA CPA MAITEA

Accountant
Eileen Katte BBus RMIT MAITEA

Librarian
Robert James Thomas BA DipLib Wales

Assistant Librarian
Hong Bernard BSc LaT. BEd Melb. GDLib MCAE

Property Manager
William James Redmond

Administrative Officer
Margaret Loris Duncan MAITEA

Administrative Staff
Elaine Attard (Pharmaceutics and Pharmacy Practice)
Joseph Andrew Candlish (Finance)
Valeria Ferraro (Finance)
Maree Elizabeth Hopper (Office of Deputy Director)
Jacqui King (Pharmaceutical Chemistry)
Lois Maree Kittelty (Pharmacology)
Janet Maree Leeder (Pharmaceutics and Pharmacy Practice)
Patricia Orellana (Pharmacology)
Louise Redmond (Office of Dean and Director)

School of Pharmaceutical Chemistry

Dean and Professor of Medicinal Chemistry
David James Craik BSc PhD LaT. FRACI
Acting Head of the School
Edward John Lloyd BSc DipEd *Adel*. BAppSc *RMIT* MSc *Melb.* PhD *Deakin* MRACI

Senior Lecturer
Manuel Needleman BSc PhD *Glasgow*

Lecturers
Ian Travers Crosby BSc PhD *Melb.* MRACI
John Valentine Hurley DipEd *Syd.* MSc *Melb.* MRACI
Magdy Naguib Iskander MSc *Alexandria* PhD *LaT.* MRACI
Michael John McLeish BSc PhD *LaT.* MRACI

Assistant Lecturers
Benny Capuano BAppSc *RMIT* MPharm VCP
Donna Louise Legge BSc *Melb.*
Peter Malcolm Skinner BAppSc *RMIT*

Laboratory Manager
Elaine Carol Borg HTEC *Liverpool Poly.* DipMus *Lond.*

Biota Research Fellow
Robin Joy Thomson BSc PhD *Monash*

DEET Research Fellows
Jeffrey Clifford Dyason BSc *Griffith*
Jennifer Carol Wilson BSc PhD *Melb.*

Glaxo Research Fellows
Basil Danylec DipAppChem *Preston* MSc *LaT.* SRN Heidelberg
L Mark von Itzstein BSc PhD *Griffith* MRACI
Gaik Beng Kok BSc PhD *Flinders* MRACI
Michael Stuart Pegg BSc PhD *Griffith*
Jeffrey John Potter BSc *Adel.* PhD *Cantab.* MRACI
Neil Taylor BSc PhD *W. Aust.*
Wen-Yang Wu PhD *LaT.*

NHMRC Research Fellows
Mark Rose BSc PhD *Monash*
Geoffrey Wickham BSc PhD *Qld*

VCP Research Fellow
Sharon Louise Munro MPharm. VCP PhD *Monash* MPS MRACI
RGH Heidelberg Research Fellow
Brian Philip Shehan BSc PhD LaT.

Wellcome Research Fellow
Gerard Peter Moloney BSc PhD Melb. MRACI

Pharmaceutical Sciences Teaching and Research Program, Program Manager
Elenni Loukopoulos BA Tas GradDipBusTech Monash

School of Pharmaceutics and Pharmacy Practice

Dean and Head of the School, Professor of Pharmaceutics
Peter James Stewart BPharm PhD Qld FPS MSHP

Professor of Biopharmaceutics
Barry Leonard Reed BPharm VIC PhD Kansas PhC FPS CBiol MIBiol MAIBiol MIPharmM FAIPM MSHP MACPP

Head of Sigma Department of Pharmacy Practice, Senior Lecturer
Louis Roller BPharm VIC MSc Melb. PhD Colum. Pac. DipEd PhC FPS MACPP MSHP

Reader
Denis Joseph Morgan MSc PhD Syd. PhC

Senior Lecturers
Peter Churchill Bury MSc Melb. PhD Monash
William Neil Charman BPharm VCP PhD Kansas MRACI
Barrie Charles Finnin BPharm VIC PhD Monash PhC
Ian Peter Griffith MA Oxon. PhD ANU MASM
William James Thiel BSc Wales PhD Monash

Lecturers
Jo-anne Elizabeth Brien BPharm Syd. BS(Pharm) DPharm Mass. MRPharmS GB RPh Iowa
Arthur Pappas MPharm VCP MPS MACPP
Kay Stewart BPharm Qld PhD Qld MPS MACPP

Assistant Lecturers
May Ruby Admans MPharm VIC MPS
Margaret Maree Doherty BPharm VCP
Andrew Jonathan Humberstone BScPharm Manchester
Michael Andrew Khoo BPharm VCP
Khai Tan Nguyen BPharm VCP
Sarah Jane Wyatt BPharm VCP
Laboratory Manager
Peter Domenic Krotsis BSc LaT.

Research Fellows
Susan Ann Charman BSc Florida State PhD Florida
Karen Therese Kennedy MPharm VPC MRACI MACPP
Christopher John Hamilton Porter BPharm PhD Notts UK
Balvant Rai Sitaram MSc PhD Auckland

Associates
Stuart John Baker BPharm VCP BA Melb. MPS
Ronald Peter Batagol PhD MPS FSHP ACIM
Judith Margaret Bingham BPharm VCP FSHP
Garth Hamilton Birdsey BPharm SAIT Grad Dip Hosp Pharm VCP
Jillian Ruth Davis BPharm VCP Grad Dip Hosp Pharm VCP FSHP
Martin Kent Garrett BPharm Qld Grad Dip Hosp Pharm VCP
Lisa Demos BPharm VCP PhD Monash
Allan Paul Hargreaves BPharm Otago BHA Grad Dip Hosp Pharm VCP
Diana Ingrid Imberger BPharm VCP Grad Dip Hosp Pharm VCP MSHP
John Michael Morgan PhD Syd. Grad Dip Comm Pharm VCP Grad Dip Corp Fin
    Swinburne Grad Dip Intrept Stud Swinburne MPS
David Beresford Newgreen BPharm VIC MBA Deakin PhD MPS
Lyn Robinson BPharm Syd. Grad Dip Hosp Pharm VCP
Michelle Diane Vienet BPharm VCP FSHP

School of Pharmacology

Dean and Head of the School, Professor of Pharmacology
Colin Raper BPharm PhD Lond. PhC MRPharmS

Reader
Frederick John Mitchelson MSc Melb. PhD Lond. PhC MRPharmS MPS

Senior Lecturers
Ian Michael Coupar BPharm PhD Lond.
Norman Peter Madsen BSc Qld MSc Wisconsin PhD Qld
David Alan Taylor, BSc PhD Melb.

Lecturer
Wendy Hope BSc PhD Melb.
Assistant Lecturers
Arthur Christopoulos BPharm VCP MPS MACPP
Shaunagh Ann Darroch BSc Monash
Karen Patricia Kerr BSc Witwatersrand DipPharm MPS
Roselyn Barbara Rose'Meyer BSc PhD Monash
Arthur Shen BSc Monash

Laboratory Manager
Malcolm David Hutson BSc MBA Melb.

Research Fellow
Anthony De Luca BSc PhD Melb.
Victorian College of Pharmacy

The Victorian College of Pharmacy was established in 1881 as the school of the Pharmaceutical Society of Victoria. That Society had itself been founded in 1857 by early immigrant British pharmacists to control and develop the professional aspects of pharmacy in the rapidly developing colony. The College was founded on similar lines to those existing at the London School of Pharmacy which in turn was owned and operated by the Pharmaceutical Society of Great Britain.

The College was initially established in the Melbourne Technological Museum, moved to Fitzroy for a short period, and was ultimately housed in the County Court building at 360 Swanston Street. The Pharmaceutical Society had purchased the building in 1882 and had carried out adequate renovations to commence classes at that site in 1884.

The first classes were established under an apprenticeship system which involved attendance at the College for tuition in chemistry, botany, materia medica and pharmacy. Students could enter the course at any date and pursue an independent course of study leading to a registration examination conducted by the Pharmacy Board of Victoria. A compulsory syllabus was formalised within the Medical Act 1915 and subsequently led to a four year apprenticeship and study requirement for registration.

In 1960 great changes took place in pharmacy education. The College, still as the School of the Pharmaceutical Society of Victoria, moved to new premises in Parkville. In the same year the Pharmacy Board approved a full-time three year course in pharmacy and abandoned the apprenticeship system of training.

The College affiliated with the Victoria Institute of Colleges in 1966 and was granted permission to offer the Bachelor of Pharmacy degree in 1967. The College thus became the first non-university school in Australia to offer a bachelors degree. A Master of Pharmacy degree followed in 1970.

Prior to 1967 the College had run as a private institution. It was funded primarily from student fees with some government assistance and the generosity of benefactors. In 1967, by an agreement between the Federal and State Governments, the College received its first appreciable government financial assistance which supplemented student fees. In 1974 the Federal Government abolished fees in tertiary institutions and took over the full responsibility of funding tertiary education at all levels.

The Swanston Street building and the original development at Parkville were funded by the Pharmaceutical Society through the generosity of its members, the pharmaceutical industry, various benefactors and with large State Government assistance. The latest laboratory block on the Parkville site was built entirely from government money but was furnished and equipped by the Pharmaceutical Society of Victoria through an appeal launched to its members and the pharmaceutical and allied industries.

In accordance with government requirements the College became an independent organisation in 1977. It became a company limited by guarantee, the Victorian College of Pharmacy Ltd, and now operates under the Companies Act.

The academic activities of the College have been governed by the Medical Act, the Pharmacists Act and the Victoria Institute of Colleges Act.
Through the repeal of the Victoria Institute of Colleges Act in 1980 the College is now accountable to the Victorian Post-Secondary Education Commission and is required to operate in accordance with the Post-Secondary Education Act 1978. In 1984 the College became a "declared institution" and now accredits its full range of courses through a mechanism similar to that used in universities.

In 1988 an Affiliation Agreement was signed between the College and the University of Melbourne, and a year later a Heads of Agreement was signed by the two institutions pursuant to which both institutions were committed to seeking an amalgamation.

In 1990 due to unresolved difficulties the amalgamation negotiations between the College and the University of Melbourne were terminated.

In 1990, also, an Affiliation Agreement and a Heads of Agreement were signed by Monash University and the College whereby the institutions agreed to pursue the aim of an amalgamation. The members of the College company subsequently resolved to change the name of the College to Victorian College of Pharmacy (Monash University) Limited.

During 1991 Government approval was given to the merger with Monash University.

In 1992 the College company was dissolved and the merger with Monash University finalised.

Some important dates in the history of the College are listed below:

1839 First pharmacy (Cotter's) established in Melbourne
1842 London School of Pharmacy established
1843 Pharmaceutical Society of Great Britain received charter
1857 Pharmaceutical Society of Victoria founded
1876 Pharmacy Board of Victoria established through the Medical Act
1877 First meeting of the Pharmacy Board of Victoria
1881 Victorian College of Pharmacy established as the School of the Pharmaceutical Society of Victoria, first lectures given at the Technological Museum
1882 J Kruze appointed Director, classes transferred to 60 Hanover Street, Fitzroy
1882 County Court Building, 360 Swanston Street, purchased from the Government (£400)
1884 Classes start at Swanston Street, H Shillinglaw appointed first Secretary/Registrar
1886 First issue, Australian Journal of Pharmacy
1887 A H Jackson appointed College Director
1887 Compulsory pharmacy course introduced for medical students
1890 S Plowman appointed College Director
1895 Major building additions at Swanston Street
1897 First female graduate
1910 Cyril Tonkin awarded his second gold medal
1913 C L Butchers appointed Secretary/Registrar
1913 Major additions to Swanston Street building
1915 Four-year apprenticeship system commences in accordance with the Medical Act
1920 A T S Sissons appointed first Dean, retires 1962
1927 Pharmacy Guild of Australia established
1928 Further building additions at Swanston Street site
1929 Fellowship course introduced (FPS by examination)
1936 The last of the major building alterations made at Swanston Street
1941 F C Kent appointed Secretary/Registrar
1943 C L Butchers Library established
1951 Property at Parkville purchased
1957 Centenary, Pharmaceutical Society of Victoria
1958 War Memorial Building Appeal launched
1960 Full-time three-year course commences
1960 College moves to new War Memorial Building, Royal Parade, Parkville
1962 Completion of the Sissons Mural
1963 N C Manning appointed Dean, retires 1978
1963 Three autonomous Schools established within the College (Pharmaceutics, Pharmacology, Pharmaceutical Chemistry)
1965 A H Kelly appointed Secretary/Registrar
1965 Further Parkville property purchased
1966 College affiliates with the Victoria Institute of Colleges
1967 Federal Government finance received
1967 Furnish and Equip Appeal
1968 Bachelor of Pharmacy degree awarded as the first non-university degree in Australia
1969 H V Feehan appointed Secretary/Registrar
1970 Master of Pharmacy degree approved
1970 Intersearch programme established with the University of Kansas
1970 Graduate School founded
1971 Further Parkville property purchased
1971 New laboratory block opened
1972 Commonwealth Pharmaceutical Association Conference, Melbourne
1973 R Burnet appointed Registrar of College
1974 Pharmacists Act replaces Part III of the Medical Act (1958)
1975 Institute of Drug Technology founded
1976 College incorporates as a Company to become an independent, autonomous College of Advanced Education
1976 Pharmaceutical Society of Australia founded
1977 Centenary, Pharmacy Board of Victoria
1978 Graduate Diploma in Hospital Pharmacy commences
1978 Victorian Post-Secondary Educaton Act
1979 G N Vaughan appointed Dean of College, resigns 1987
1981 Centenary, Victorian College of Pharmacy Centenary Banquet, 23 May 1981, Great Hall, National Gallery of Victoria
1982 Centenary Plaque installed
1982 Sigma School of Pharmacy Practice established
1983 Graduate Diploma in Community Pharmacy commences
1984 Buildings on Parkville campus named SISSONS, SCOTT and MANNING
1984 College becomes a Declared Institution; it thus accredits its own courses
1985 Reader position included in the academic staff establishment
1986 Institute of Drug Technology Ltd changes to Institute of Drug Technology (Aust) Pty Ltd with College holding a substantial equity
1986 College recognised as Department of Pharmaceutical Science of the University of Melbourne for the purpose of conducting Doctor of Philosophy programmes
1987 Institute of Drug Technology (Aust) Pty Ltd becomes a public company and changes its name to Institute of Drug Technology (Australia) Ltd
1988 T R Watson appointed Dean and Director of College, retires 1991
1988 Affiliation Agreement signed by University of Melbourne and Victorian College of Pharmacy
1989 Heads of Agreement signed between the Victorian College of Pharmacy and the University of Melbourne. The two institutions thereby agreed to pursue the aim of an amalgamation scheduled for 1 January 1991
1990 Amalgamation negotiations with the University of Melbourne terminated
1990 Affiliation Agreement and Heads of Agreement signed between the College and Monash University whereby the institutions agreed to pursue the aim of an amalgamation
1991 C B Chapman appointed Dean and Director of College
1991 College name changed to Victorian College of Pharmacy (Monash University) Limited
Bachelor of Pharmacy Course

The requirements for the Bachelor of Pharmacy course are specified by the Pharmacists Act 1974 and the Regulations made thereunder. The Act and the Regulations are administered by the Pharmacy Board of Victoria.

Entry Requirements

The College receives more applications than it has places available, and it is therefore necessary to select applicants on the basis of academic merit. In order to be eligible for admission to the Bachelor of Pharmacy course applicants from Victoria must fulfill the following basic requirements:

1 Requirements for entry in 1993 and 1994
Prerequisites: Units 1 & 2
Either Change and Approximation or Reasoning and Data or Space and Number

Prerequisites: Units 3 & 4
English and Chemistry, plus one of Change and Approximation, Extensions Change and Approximation, Reasoning and Data, Extensions Reasoning and Data

2 Requirements for entry in 1995
Prerequisites: Units 3 & 4
English, Chemistry and Mathematical Methods

The chemistry and mathematics prerequisites will be included in the best four subjects for selection purposes. When making an academic judgement to distinguish between applicants in the vicinity of the quota cut-off mark, consideration will be given to the full range of an applicant’s VCE studies and results with particular reference to the level of performance in CATs in prerequisite studies.

In order to select the best qualified applicants for admission the College calculates a selection score for each applicant by adding the marks obtained in the studies Chemistry and a branch of Mathematics to the marks obtained in the applicant’s two next best studies approved by the Victorian universities for the purposes of university entrance. It is believed that the studies Biology and Physics provide a useful background for students commencing the pharmacy course.

For full-time VCE candidates the “best four” total thus obtained will be increased by adding 10 per cent of the mark obtained in up to two additional studies approved by the Victorian universities for the purposes of university entrance.

Interstate applicants

Interstate applicants will be evaluated on the basis of their local Year 12 (HSC) examination results, which must include passes in English, Chemistry, and a branch of Mathematics.

Overseas applicants

Overseas students studying Victorian Certificate of Education in Victoria should apply for entry through the Victorian Tertiary Admissions Centre.

Overseas students, undertaking tertiary studies in Victoria, who wish to apply for admission to the Bachelor of Pharmacy may do so by contacting the Deputy Director and requesting an application form.
Overseas students, residing overseas or interstate applying for scholarships under the Federal Government’s John Crawford Scholarship Scheme (JCSS) may apply for admission to the College through (JCSS) by contacting their local overseas post or the College respectively.

Applications for admission to the College in 1993 will not be accepted from any other overseas students residing overseas or interstate.

Transfer students

Persons who have completed or partially completed a post-secondary education course will be assessed on individual merit. Credits (if any) for subjects in the pharmacy course will be determined after a person has been selected to commence the course.

Application forms for admission may be obtained from the Victorian Tertiary Admissions Centre at 40 Park Street, South Melbourne, 3205. The completed forms must be lodged with the VTAC prior to 21 September of the year preceding that in which enrolment is desired. (Note: the College’s academic year runs from late February to December.)

The Aims and Objectives of the Bachelor of Pharmacy Course

The aim of the three year Bachelor of Pharmacy course at the Victorian College of Pharmacy is to produce graduands with a knowledge and understanding of the sciences and technologies which underpin the practice of pharmacy, and who, after a further period of supervised professional practice training and experience, may become registered as pharmacists, capable of building a career in any branch of pharmacy.

The undergraduate studies are to be oriented towards and placed within a pharmacy context.

The postgraduate period of practical training (the current pre-registration year) must be regarded as an essential educational bridge which links the undergraduate course and the graduand’s work as a registered pharmacist.

At the end of the undergraduate course graduands are expected—

• to understand sufficient basic and applied sciences to be able, given more experience, to integrate and apply the knowledge to practical professional situations.

• to have acquired appropriate dispensing and other manipulative skills to be able, at the end of the pre-registration year, to practise competently as pharmacists.

• to have acquired sufficient communication skills in the English language to be able, given more experience, to practise competently as pharmacists.

• to have acquired the personal attributes, qualities and regard for professional ethics and standards needed to practise as responsible health professionals.

• to have a commitment to maintain and build upon their knowledge base by continuing the educational process throughout their careers.
To meet these aims, the graduand should have —

1 A DETAILED KNOWLEDGE of—
   (a) the structural features and physico-chemical properties of drugs, as a basis for the understanding of the molecular mechanisms of drug action; factors affecting absorption; distribution, metabolism and excretion; and the design of dose forms
   (b) human physiology and pharmacology, as a basis for the treatment of disease; the optimisation of the treatment; and the avoidance of side effects, contraindications, adverse effects and toxic reactions
   (c) the formulation and preparation of drugs into effective dose forms so as to optimise therapeutic efficacy
   (d) the dispensing of medicines to individual patients with due regard for the legal, therapeutic and professional requirements
   (e) the laws applying to the professional practice of pharmacy

2 A GENERAL KNOWLEDGE of —
   (a) common human disease states, in order to understand the basis of rational drug therapy
   (b) the recognition and treatment of minor ailments and the ability to appreciate the need to refer patients to other health professionals
   (c) the techniques of counselling patients and communicating with other health professionals with respect to the proper use of medication and other matters related to health care
   (d) sources of relevant information and the ability to critically evaluate and use it appropriately

3 An UNDERSTANDING of —
   (a) the processes involved in the development of new drugs and the approval of new medicines for therapeutic purposes
   (b) commonly used diagnostic reagents and tests, appropriate to the practice of pharmacy
   (c) the place of pharmacy in the health care system
   (d) the hazards associated with commonly used chemicals
   (e) the abuse and misuse of drugs, medicines and other substances
   (f) nutrition, as it relates to its influence on diseases and their treatment

Note

The objectives are grouped into three sections, i.e. those requiring a "detailed knowledge", a "general knowledge" and an "understanding". These terms are not defined with precision, but are used to give an indication of the depth in which each topic is presented. The order in which the topics are listed is not to be taken as implying any emphasis or priority.
Curriculum

The academic course occupies three years of full-time study. Four grades of pass will be awarded in the following subjects of the course (High Distinction, Distinction, Credit, Pass):

First Year
- Pharmaceutics I
- Pharmaceutical Chemistry I
- Pharmaceutical Pharmacology I
- Mathematics
- Pharmacy Practice I (including Human Behaviour)

Second Year
- Pharmaceutics II
- Pharmaceutical Chemistry II
- Pharmaceutical Pharmacology II (including Biochemistry)
- Pharmaceutical Microbiology
- Pharmacy Practice II

Third Year
- Pharmaceutics III
- Pharmaceutical Chemistry III
- Pharmaceutical Pharmacology III
- Pharmacy Practice III

Details of subjects will be found on page 24.

Final Examination, Pharmacy Board of Victoria

Having completed the above requirements for the Bachelor of Pharmacy degree, in order to register as a pharmacist, graduates must complete a period of practical training and pass the final Examination conducted by the Pharmacy Board of Victoria. Details of these requirements will be found on page 74.

Courses of Study

Council’s policy concerning courses of study at the Victorian College of Pharmacy.

1 The Council of the Victorian College of Pharmacy and the Pharmacy Board of Victoria
   (a) determine the educational requirements for entry to the Bachelor of Pharmacy degree course, the course of study and the subjects which shall be studied for the prescribed examinations;
   (b) appoint the Board of Examiners; and
   (c) control and direct examinations at the Victorian College of Pharmacy.
2 The College controls and supervises students admitted to a course of study, and matters relating to a course of study, except those referred to in clause 1 above, will be decided at the absolute discretion of the Council.

3 Subject to these rules, students must pass the examinations in all the subjects prescribed for study during the first year of the course before the College will admit them to the course of study in the subjects prescribed for the next year of the course and likewise for each succeeding year.

4 A candidate who fails to attain the standard set by the examiners at the examinations in any year may be admitted to repeat the course of study in the following year or may be excluded from the course.

5 The privilege of repeating a year will only be extended with the approval of Council.

6 A candidate who fails to attain the standard set by the examiners at the annual examinations on more than one occasion or who fails to attain the standard set by the examiners at the annual examinations after having been granted advanced standing in the pharmacy course or having failed in another tertiary institution may be excluded from the course.

7 Candidates who present themselves initially for the whole of the Pharmacy I, II or III Examination may, at the discretion of the Board of Examiners, be granted credit for single subjects in which they have attained the standard set by the examiners.

8 With reference to the Pharmacy III Examination, the single subject credits referred to in rule 7 may not be held beyond the Pharmacy III Examination held in November the following year, after which time re-entry for the whole examination shall be required.

9 After two years have elapsed following the candidate’s initial entry to the Pharmacy III Examination, the College will not accept a further enrolment from the candidate.

10 Where sickness or other circumstances warranting compassion arise, candidates for examinations must furnish written information to the Deputy Director immediately. In the case of sickness a medical certificate is required and must be forwarded to the Deputy Director within forty-eight hours of the time of consultation.

11 A candidate must observe the examination rules published on page 92 of this Handbook by the Victorian College of Pharmacy and the Pharmacy Board of Victoria.

12 The Council of the College and the Pharmacy Board of Victoria will publish the results of examinations but the Council of the College may, in the case of a candidate’s failing to observe the examination rules published on page 92 of this Handbook, omit the results of the said candidate and/or exclude the said candidate from further courses of study at the College.

13 Supplementary examinations will be held when necessary at the discretion of the Board of Examiners. Individual examiners may prescribe additional examinations, either written, oral, or practical when and as required. Candidates are
therefore advised to be available after the completion of the annual examinations and pending publication of the examination results.

**Fees**

Students enrolling for the BPharm course on a full-time basis will be required to meet the following charges:

- Apparatus deposit* $60
- Annual student membership of Pharmaceutical Society of Australia (Victorian Branch) $20
- Annual subscription to the Victorian Pharmacy Students Association (granting access to Monash sporting facilities) $50
- Service fee $60

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* Refundable, less cost of breakages, at the termination of the course. Any student who breaks apparatus valued at more than $60 may be required to pay a further $60 deposit.

Students enrolling for the BPharm course on a part-time basis will be required to meet the following charges:

- Apparatus deposit* $60
- Annual student membership of Pharmaceutical Society of Australia (Victorian Branch) $20
- Annual subscription to the Victorian Pharmacy Students Association (granting access to Monash sporting facilities) $29
- Service fee $36

<table>
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* Refundable, less cost of breakages, at the termination of the course. Any student who breaks apparatus valued at more than $60 may be required to pay a further $60 deposit.

Full-fee paying overseas students commencing studies in 1993 are required to pay fees of $8400 per semester. These fees will incorporate the charges set out above.

In addition to the above fees, approximately $700 per annum is required for textbooks, dissecting instruments, stationery, etc.

**Higher Education Contribution Scheme (HECS)**

As from January 1989 all Australian students, other than those specifically exempted, who enrol in post-secondary institutions are liable to incur a charge under the Higher Education Contribution Scheme (HECS). In 1993 the course contribution set by the Federal Government will be $2328 for each year of equivalent full-time study.

**Australian Government Means-tested Allowances**

Information on the Government living, incidentals, dependants, and travel allowances may be obtained from:
Special Assistance for Students

Limited funds for loans to students are available for specific purposes. Details can be obtained from the Deputy Director.

Royal Australian Chemical Institute (RACI)

Bachelor of Pharmacy graduates from the Victorian College of Pharmacy after a period of practical experience, are eligible to become Members of the Royal Australian Chemical Institute. This means that such graduates are able to practise in many areas of industry as professional chemists, and receive the salaries determined for Members of RACI.

Change to Bachelor of Pharmacy Course

Students entering first year in 1993 are advised that the College is currently investigating a proposal to extend the course to four years. Under such a proposal it is anticipated that students would be eligible to graduate and register at the end of the final year. As soon as details of any changes to the length and structure of the course are approved students will be notified.
First Year

PHARMACEUTICS I

A course of 40 lectures, 16 tutorials and 39 hours of practical work.

The aim of the course is to provide students with a detailed knowledge and understanding of certain aspects of the physical, chemical and biological sciences which relate to the formulation of drugs and their distribution in the body.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

the weights, measures and calculations used in pharmacy practice;
the principles of drug administration;
the principles of dosage form design;
the formulation of liquid pharmaceutical products;
the factors influencing drug stability;
the containers used for pharmaceutical products;

developed skills in the areas of

performing pharmaceutical calculations;
the preparation of certain pharmaceutical dose forms;

an appreciation of

the need for accuracy and thoroughness in manufacture of pharmaceutical products;
the factors which influence the design of pharmaceutical dose forms.

SYLLABUS

Weights, measures & calculations. The metric system of weights and measures, pharmaceutical calculations, mass-volume relationships, alcohol and acid dilutions, percentage formulae, wet and dry attenuations, alligation. Introduction to the Weights and Measures Act. The prescription balance, sensitivity, legal tolerances in weighing and measuring, calculation of per cent error in weighing.

Principles of drug administration. Effects of varying biological factors, children's dose rules, the doses and uses of some common drugs. The role of the pharmacist in dealing with inappropriate dosages.

Dose forms. The oral, rectal, parenteral and topical routes of drug administration. Bulk powders, individual powders, capsules, pills, tablets, ointments, creams, emulsions, solutions, suspensions, drops (eye, ear and nose), suppositories and pessaries.

Isotonic solutions. Osmotic injury of tissues, freezing point depression and osmotic pressure, osmotic calculations. The Wells Approximate Liso values. The limitations of physico-chemical methods of adjusting isotonicities, the haemolycic method of Husa, the haemacrit method of Setnikar and Telmelcou.

Milliequivalents, millimoles and milliosmoles. The electrolytes of normal serum, electrolyte solutions for intravenous use, notation in prescriptions, calculations.
Introduction to Biopharmaceutics. Rate limiting steps, the importance of the dose form.

Solution formulation. Principles of formulation; pharmaceutical solvents; solutes, mechanisms of solution, concentration. Factors effecting solubility, including temperature, pH, complexation, solubilisation and cosolvency. Pharmaceutical colouring, flavouring and preserving agents.


Buffering in pharmaceuticals. Chemical and biological buffer systems; physiological aspects of buffering and drug solubility, stability and action, formulation of pharmaceutical buffers.

Solution dose forms. Oral solutions, parenteral solutions, ophthalmic and nasal solutions.

Filtration. Factors affecting filtration rate, mechanisms of filtration, procedures, types of filters, filter aids.

Stability of pharmaceuticals. Forms of instability; modes of chemical degradation, hydrolysis, oxidation, photolysis, dehydration, racemisation; prevention of degradation, use of antioxidants; modes of physical degradation; shelf-life, stability testing.

Pharmaceutical containers. Glass, plastics, metals; interactions between product and packaging; influence of packaging on product stability.

Rheology. Shear stress, strain and strain rate. Newtonian, plastic, pseudoplastic and dilatant flow. Thixotropy.

Surface properties. Surface energy and surface tension. Wetting and capillarity. Surfactants, micellisation, solubilisation and detergency. Insoluble films.

Liquid-in-liquid systems. Theories of emulsification; emulsion type; HLB; emulsion stability; formulation and applications.

Practical

13 X 3 hours of practical sessions to teach the skills required in the preparation of pharmaceutical dose forms to reinforce the principles covered in the lecture course.

Textbooks


References

ASSESSMENT

The final Pharmaceutics I assessment is made up of the following components:

Progress examination (May); 1½ hours 10%
Practical work 10%
End-of-year examination; 2½ hours 80%
PHARMACEUTICAL CHEMISTRY I

A course of 84 lectures, 32 tutorials and 75 hours practical work.

The major aim of year 1 of the course is to provide the background in physical and organic chemistry necessary to understand the clinical/medicinal chemistry covered in later years, as well as to provide essential background for pharmaceutics and pharmacology. The first semester comprises physical chemistry for pharmacists. Students start the year with atomic structure, bonding and spectroscopy, and once appropriate molecular concepts have been grasped, the bulk properties of matter are addressed. After an introduction to the gas, liquid and solid states, phase equilibria are examined. This is followed by pharmaceutical aspects of solutions, including solution physical chemistry, ionic equilibria, bio-inorganic chemistry and electrochemistry. Applications of analytical chemistry relevant to pharmacy are introduced for development later in clinical chemistry (Pharmaceutical Chemistry II). The topic of reaction kinetics is introduced to provide a foundation for drug stability (Pharmaceutics I), receptor binding and enzyme kinetics (Pharmaceutical Chemistry II). The second semester covers organic chemistry. Two themes are emphasized: (1) the importance of functional groups to drug properties (e.g., solubility), and (2) that chemical reactions change drug structures and hence affect their properties. Emphasis is placed on the types of reactions that occur in the body. The organic chemistry course provides the basis for biochemistry (taught in Pharmaceutical Pharmacology II), the chemistry of enzymes/receptors (taught in Pharmaceutical Chemistry II), and stability studies (taught in Pharmaceutics II).

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

- key concepts in structure and bonding, including atomic orbitals, molecular orbitals, sigma- and pi-bonds, hybridization, energy levels, electronic transitions;
- the basic laws underlying the ultraviolet, visible and infrared regions of the electromagnetic spectrum and their application to quality control and clinical practice;
- the molecular basis for different properties of the gas, liquid and solid states;
- the basis for and application of phase diagrams in describing pharmaceutical materials;
- factors important in solution behaviour, including the relationship between solution composition and vapour pressure, and the theory and application of colligative properties in pharmacy;
- the principles of ionic equilibria and their application in pharmacy, in particular to acid/base reactions, buffer solutions, solubility and drug absorption;
- the basic theory of electrochemistry in order to understand applications in the determination of physicochemical constants of drugs and in quality control;
- the key concepts associated with explaining rates of chemical reactions, with particular emphasis on pharmaceutical applications such as drug stability and pharmacokinetics;
the basic principles of thermodynamics and their pharmaceutical application to
areas such as biochemical reaction energetics, nutrition, and pharmacy prod-
ucts;
the principles of metal-ligand complex formation and its application to bio-
inorganic chemistry and the treatment of metal poisoning;
the structures and physiocochemical properties of key classes of organic com-
pounds and the importance of functional groups in determining pharmaceutically
important properties such as solubility or reactivity;

developed skills in the areas of
measurement and recording of data relevant to the understanding of drug struc-
ture and reactivity;
performing numerical calculations relevant to pharmacy based on experimental
or theoretical data;
an appreciation of
the role of molecular shapes and electronic distributions as the basis for drug-
receptor interactions;
the importance of physicochemical properties of drugs in determining drug ac-
tivity.

SYLLABUS

Physical and Analytical Chemistry
A course of 50 lectures.

Chemical bonding. Quantum theory, atomic orbitals, hybridisation. Covalent
bonds, valence bond and molecular orbital theories. Polar molecules, intermolecu-
lar bonds, molecular association. Relative strengths of bonds.

Spectroscopy. Energy level diagrams, chromophores and auxochromes. Ultra-
violet, visible, fluorescence, emission and atomic absorbance spectroscopy. Intro-
duction to qualitative infrared spectroscopy. Beer’s law and pharmaceutical
analysis. Photochemical reactions of drugs, photosensitive degradations, sun-
screens, photochemotherapy.

States of matter. Gases. Graham’s and Fick’s laws of diffusion. Dalton’s law of
partial pressures. Deviation from ideal gas behaviour, van der Waals’ equation.
Liquids. Liquefaction of gases, vapour pressure of liquids, latent heat of vaporis-
ation, the Clausius-Clapeyron equation.

Phase equilibria. One-component systems. Solid, liquid and vapour equilibria, the
water diagram, Gibb’s phase rule. Polymorphism, properties of polymorphs. Two-
component systems. Solid solutions, eutectic mixtures. Miscibility of liquid mix-
tures, the phenol-water system. Partition between immiscible solvents. Chroma-
tography. Three-component systems. The miscibility of toluene, ethanol and water,
triangular diagrams.

in liquids. Vapour pressure of liquid mixtures, ideal behaviour, Raoults law. Devi-
ation from ideal behaviour, azeotropes. Colligative properties of solutions. Osmotic
pressure, the van’t Hoff coefficient, isotonicity.
Bioinorganic chemistry. Formation, stability and nomenclature of complex ions. Chelation and organometallic complexes in biological systems.


Thermodynamics. Heat and work, conservation of energy, internal energy, enthalpy, heat capacity. Thermochemistry, bond energies, resonance energy.

Reaction kinetics. Reaction rate, order and molecularity. Rate equations for zero, first and second order reactions. Reaction mechanisms, collision theory, transition states, drug stability.

Electrochemistry. Galvanic cells, Nernst equation, oxygen electrode, cell potentials and free energy, pKa, solubility product and equilibrium constant. Electrochemistry and biological cell potentials, pharmaceutical analysis and dissolution studies.

Textbooks


References


Organic and Medicinal Chemistry

A course of 34 lectures.


Reactions of organic molecules. The chemistry of selected classes of organic compounds viz. aliphatic and aromatic hydrocarbons and their halogen derivatives, alcohols and phenols, aldehydes and ketones, carboxylic acids, esters, amides, acid chlorides, amines and other nitrogenous compounds, thioles and other sulphur-containing molecules. Examples of polyfunctional molecules such as amino acids and amino alcohols will be discussed. Elementary electronic theory and reaction mechanisms will be introduced where appropriate.

Throughout the course special reference will be made to compounds of biological, medicinal and pharmaceutical importance.
Introduction to medicinal chemistry. Influence of such factors as shape, size, ionisation state, solubility and substituent groups on the biological action of selected drug classes.

Textbook


References


Supplementary Material

or

Practical

A course of 75 hours practical work in analytical, physical, medicinal and organic chemistry. Experiments are performed which illustrate the principles presented in the lecture course.

Students are required to wear safety glasses and laboratory coats in the laboratory.

Textbook


References


ASSESSMENT

The final Pharmaceutical Chemistry I assessment is made up of the following components:

- Progress examination (May); 1½ hours 10%
- Practical work and other tests 20%
- End-of-year examination; two 2 hour papers 70%

NOTE: Each student will be issued with a set of apparatus, on payment of a deposit. The cost of replacing any damaged apparatus will be deducted from this deposit and the balance refunded to the student.
PHARMACEUTICAL PHARMACOLOGY I

A course of 88 lectures, 12 tutorials and 75 hours of practical.

The major aim of Pharmaceutical Pharmacology I is to provide students with a knowledge of mammalian physiology as a basis for understanding how physiological processes are altered by disease states or affected by drugs. The course is designed as a logical sequence so that students who enter the course with minimal knowledge of biology should, by the end of the first year, be proficient enough in the subject to be able to understand the functions of the body systems and how integration of these functions is achieved. This knowledge is mandatory for understanding Pharmacology and Pathology taught in later years.

The course starts with a series of lectures on the biochemistry, structure and function of cells. Examples are then given of specialised cell types, for example nerve and muscle, which are involved in a variety of physiological processes. By this stage of the course students should have enough knowledge of cellular processes to understand how cells are adapted to carry out their specific functions and thus the study of body systems can be commenced. This comprises the major part of the course and begins midway through the first semester. Once students have an understanding of how each system maintains its normal function the relationship between abnormal physiological function (pathophysiology) and disease states is explained briefly. Basic concepts about how drugs are used to correct abnormal functions are also introduced.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

detailed knowledge and comprehension of

basic cellular anatomy and biochemistry and how these processes are utilised in cells with specialised functions;

cellular reproduction and genetics; chromosomal abnormalities leading to genetically based human diseases;

properties of cell membranes including transport of substances into and out of cells and the transmission of electrical impulses along nerve cells;

structure and function of smooth, skeletal and cardiac muscle;

chemical transmission between nerve cells and from nerve cells to effectors (glands or muscle);

the physiology of body systems including nervous, endocrine, cardiovascular, respiratory, digestive, urinogenital systems. Also covered is the physiology of the liver, body fluids and sense organs;

developed skills in the areas of

the observation and measurement of physiological processes;

the assessment and integration of physiological information;

an appreciation of

the integrated functioning of physiological systems;
the pathophysiological changes arising from defects in normal physiological functions;
the potential sites of action and mechanisms by which therapeutic agents can affect normal and abnormal physiological function.

SYLLABUS

Basic cell physiology

Cellular structure. General structure and functioning of cells, cytoplasm, lysosomes, mitochondria, endoplasmic reticulum, Golgi complex, ribosomes, centrosomes, nucleus. Functional and structural specialisation in cells.


Cellular functions
Membranes. Osmotic behaviour of cells, diffusion, the Gibbs-Donnan equilibrium, active transport. The electrical properties of cell membranes, resting and action potentials, the Nernst equation. Propagation of action potentials in myelinated and non-myelinated fibres, refractory period and after-potentials. Effects of anodal and cathodal potentials and of inorganic ions on membranes. Physiological salt solutions.


General physiology
Organisation of spinal cord and simple reflex arcs. Receptors and receptor organs. Nerve generation and regeneration.

*Endocrine function.* Introduction to the hormonal system, functions of hormones, their release and their role in homeostasis.


*Feeding, digestion and absorption.* The gastrointestinal tract, its development, function, hormonal and nervous control. Absorption.

*Liver.* Structure and functions; storage, synthesis, metabolism and excretion, the biliary system.

*Excretion.* General patterns and organs involved. Structure and function of the vertebrate kidney.

*Temperature regulation.* Poikilotherms, heterotherms and homiootherms. Control mechanisms, temperature receptors, sweat glands, vascular changes.

*Special senses.* Structure and function of organs concerned in sight, hearing and balance. Chemoreception.


**Practical**

26 × 3 hour practical sessions designed to illustrate certain aspects of the syllabus. The practicals also serve to teach students the logical approach and skills required to gain physiological information by observation and experimentation. Students must provide themselves with dissecting instruments.

**Textbooks**

Advice on selection of some of the following books will be given in the introductory lecture.


**References**


**ASSESSMENT**

The final Pharmaceutical Pharmacology I assessment is made up of the following components:

- Progress examination (May); 1½ hours 10%
- Practical work and ongoing assessment 20%
- End-of-year examination; 3 hours 70%
MATHEMATICS

A course of 50 lectures, 17 tutorials and 23 hours of practical work.

The course aims to provide students with the necessary calculus and statistical techniques for the subjects of the pharmacy degree and prepare future graduates for the increasing use of computers in the profession.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

the principal components of hardware and software involved in operating a computer;

the use of time-sharing computers and stand-alone PCs;

the basic methods of differentiation and integration and their application to maxima and minima problems, rate equations and chemical kinetics;

logarithmic scale and triangular graph papers;

solution of simple ordinary differential equations;

the principles of partial differentiation with an emphasis on application to thermodynamics and diffusion theory;

the presentation of statistical data using tables, histograms and measures of central tendency and dispersion;

probability distributions, the concept of a sampling distribution and application to the derivation of confidence intervals;

making statistically based decisions using hypotheses testing;

the theory of regression and correlation;

developed skills in the areas of

computer use;

problem solving;

logical, orderly thought and accuracy in working;

program development and testing;

application of mathematical models using calculus in the areas of physical chemistry, physical pharmacy and biopharmaceutics;

selecting the appropriate statistical method to calculate a confidence interval or test a hypothesis;

an appreciation of

the use of computers to store, manipulate and retrieve information;

the application of calculus to physical and biological processes;

the interpretation of simple clinical results using a range of statistical tests.
Computer Studies

General introduction. Purpose and basic components of a computer. Hardware, software and operating systems.

Micro computers. IBM and standards in the computing industry. DOS and other operating systems. Booting up and re-booting. Disks — capacity and industry standards, formatting options. Connecting, configuring and using a printer. Software installation.

Multi-user computers and networks. Login and security, quotas and limits. Printouts and print queues. Timeshare commands.


Tutorial classes will be run in conjunction with the coursework and will provide opportunities to practise, understand and use the information presented. A series of exercises will develop keyboard skills, and interactive teach-yourself programs are available for many aspects of the work. Students will be required to write and run programs to solve simple problems.

Calculus

Differentiation. Limits, definitation, product, quotient, function of a function, implicit differentiation, stationary points, turning points, points of inflection and function sketching.

Logarithmic plots. Exponential and logarithmic functions, semi-logarithmic and logarithmic plots.

Integration methods. By parts, algebriac substitution and partial fractions.

First order rate processes. Definition, different physical processes obeying the law (e.g. radioactive decay, chemical reaction, micro-biological growth, elementary pharmacokinetics), half-life and semi-logarithmic plots.

Zero, Second and Third Order Reaction. The rate equations, their solutions and half-life.

Triangular Charts. Graphical representation of three component systems.

Partial Differentiation. Functions of several variables, first and second partial derivatives, geometric interpretation.

Integration. Definite integrals, area under a curve, infinite limits, approximate integration methods (Trapezoidal Rule).

Statistics

*Presentation of Sample Data.* Frequency tables, histograms and cumulative frequency distributions.


*Probability Distributions.* General properties, the binomial, Poisson and normal distribution. Normal probability graph paper. The log normal distribution and log probability graph paper. Normal approximation to the binomial distribution, distribution of proportions.

*Sampling.* Random sampling, the Central Limit Theorem, calculation of sample size to attain a required accuracy.

*Estimation.* Point and interval estimates, Student's t-distribution. Confidence intervals for the mean and for the difference of two means (independent populations). The pairing of samples, confidence intervals for paired data. Confidence intervals for the difference of two proportions (independent populations). Confidence intervals for the variance, the chi-square distribution.

*Hypothesis Testing.* Testing using confidence intervals. The \( H_0 \) and \( H_1 \) hypothesis, type 1 and 2 errors, one sided and two sided testing, \( p \) values, operating characteristic curves.

*Fitting a Line.* Least squares fit using partial differential calculus to develop the normal equations.

*Regression Theory.* The mathematical model, residual variance, confidence intervals for slope, intercept and predicted Y value.

*Correlation.* Linear correlation coefficient.

*Contingency Tables.* Test for independence testing several proportions, the chi-square distribution.

Textbooks


References


Jones RM. *Introduction to Computer Applications Using BASIC.* Allyn and Bacon, 1981.


The final Mathematics assessment is made up of the following components:

- Progress examination (May); 1½ hours: 10%
- Computer studies tutorial work: 10%
- End-of-year examination; 3 hours: 80%
PHARMACY PRACTICE I

A course of 38 lectures, 8 hours of tutorials and 36 hours of practical work.

Pharmacy is a knowledge system in which chemical substances (drugs) and people who use them (patients) meet and interact. The required drug therapy is only optimally effective when both the drugs and those who consume them are fully understood. Consequently, the actions of medicines, as well as depending on the physiology and other biological functions of the human body, are also affected by the social, cultural and emotional natures of the patients. These latter aspects we can term social and behavioural sciences and are grounded in the natural orders of life. While the underlying disciplines of pharmacy and medicine continue to be in biochemistry, physics and pharmacology, the practice of pharmacy and medicine takes place in the everyday world of human beings — patients, clients and customers — their feelings, fears, expectations, and interpretations. All of this is embraced by the term Pharmacy Practice. Thus, Pharmacy Practice is what pharmacists do.

Since a large amount of time spent by a pharmacist is in one to one communication with patients, doctors and other members of the health profession, the students will be taught the rudiments of oral and written communication skills and will learn aspects of human behaviour so as to best undertake the counselling of patients when dispensing medicines. This segment of the course forms part of a motivational and educational component to the student for their studentship period at the end of first year. It also serves as a prerequisite for the second year course in pharmacy practice which will cover counselling, social pharmacy and illness behaviour in depth. It should also be remembered by the student that the ideals of modern day Pharmacy Practice as enunciated during these early lectures and practicals in Pharmacy Practice I must be carried over into other areas of the course and into the subsequent years of the pharmacy course and the traineeship year.

Thus, pharmacists must not only have ready knowledge about drugs and medicines, but they must also have an understanding about how people relate to each other and how, in turn, pharmacists can best communicate with them.

Accordingly, the major aims of this course are to provide students with a knowledge and understanding of the legal, ethical, behavioural and scientific requirements for the dispensing of medicines. This, in turn, is closely associated with Pharmaceutics I.

The course is also designed to instill into the students an ability to express concern, compassion and sensitivity in patient care through an understanding of Human Behaviour.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

the ethics, the professional roles of the modern day pharmacist and the historical background to the profession of pharmacy. The role of the pharmacist as a primary health-care professional and in the delivery of professional pharmacy services as part of the health-care team. The types of employment for
pharmacists; the pharmacist-patient relationship and the pharmacist-physician relationship;
the legal and professional requirements of a prescription and its recording and processing;
the Drugs Poisons and Controlled Substances Act 1981 and Regulations; the Pharmacist Act 1974 and Regulations 1992;
sources of information on drugs and drug products and how to obtain such information by the correct usage and literature sources of the library;
appropriate pharmacy-orientated human behaviour, particularly in a health-care setting, including abnormal behaviour;
the Pharmacy of a range of commonly used drugs;
developed skills in the areas of
oral and written communication;
the dispensing of medicines to individual patients with due regard for the legal, therapeutic and professional requirements;
the recording of prescriptions and patients details including the use of pharmacy computers;
the importance of accuracy and an eye for detail in the dispensing of medicines;
an appreciation of
the relationships existing between drugs, medicines and patients;
the concept of professionalism and the responsibilities associated with being a professional;
the "feeling" (culture and ethos) of pharmacy as it relates to the total health-care setting.

SYLLABUS

Professional Pharmacy

*Historical aspects and the roles of modern day pharmacists.* The development of pharmacy as a profession. Pharmacy and medicine, professional roles of the pharmacist, ethical considerations. Role of the pharmacist in the maintenance of patient's health. The health care system in Australia.

*The prescription.* The model prescription, the legal requirements of a prescription, types of prescriptions, common pharmaceutical Latin abbreviations. Trade names, generic names. The role of the pharmacist in relation to the physician, the prescription and the patient. Recording of prescriptions and patient profiles.

*Dispensing.* The qualities of a properly dispensed medicine. Dispensing drill as applied to Pharmacy Practice.

*Legal aspects of pharmacy.* Sources of formulae, legal precedents for standards, introduction to the Pharmacists Act and Regulations, the Drugs, Poisons and Controlled Substances Act, Schedules to the Act and Regulations.
The Pharmacy of a selected group of commonly used drugs. Their pharmacy and their various presentations.

Communications in Pharmacy Practice

The use of English. Introduction to what constitutes good written English. Styles of English. Layout and presentation for essays etc. Introduction to good oral communications skills.


Human Behaviour

Nature of human behaviour. Approaches, scope, research and measurement, the place of human behaviour in the health profession.

Development. Factors governing development, early years, cognitive development, personality and social development, identification, adolescence, search for identity, middle years, old age, how to relate to geriatric patients.


Consciousness and control. Consciousness, sleep, dreams, psychoactive drugs and consciousness. The non-therapeutic use of drugs.


Remembering. Memory, short term, long term, improving memory, aids to memory, improving patient compliance.

Emotions and motivation. Motivational concepts, basic drives, hunger, obesity, sex, theories of motivation, aggression, emotion, emotional expression, motivation and the pharmacist, motivation and the patient.

Mental abilities. Genetic and environmental determinants of intelligence, testing aptitude and achievements, effect of age on body processes and intelligence, communication with less able individuals.

Personality and its assessment. Shaping of personality, approaches to personality, trait, social learning, psychoanalytic, phenomenological, the non-compliant personality.

Abnormal behaviour. An introduction to the classification of psychopathologies as laid down by the Diagnostic and Statistical Manual of Mental Disorders 3rd Revised Edition (DSMIIIIR). Handling difficult clients.


The therapies. Patients' symptoms, attitudes, means of modifying behaviour in a positive direction. Applications to patients.
Practical

12 × 3 hour sessions in the dispensing of medicines.

A three hour session will also be held in which each student will present a 5–10 minute oral dissertation to the group on a given aspect of drug use as depicted by "Self Care" cards.

In conjunction with the lectures and practicals a "Drug in profile" will be displayed each week. Students are expected to maintain records of the Pharmacy of these "Drugs in profile".

Textbooks


or


References

*Australian Journal of Hospital Pharmacy.*

*Australian Journal of Pharmacy.*

*Australian Pharmacist.*


ASSESSMENT

The final Pharmacy Practice I assessment is made up of the following components:

Progress examination (May); 1½ hours 10%
Essay, 2,000 words, due end of July 20%
End-of-year examination; 2½ hours 70%

Dispensing: Students are required to reach a satisfactory level of competence in dispensing by the end of the course.
PHARMACEUTICS II

A course of 36 lectures, 10 tutorials and 57 hours of practical work.

The aim of the course is to provide students with a detailed knowledge and understanding of the formulation, preparation, and basic pharmacokinetics of certain dose forms.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

**a detailed knowledge and comprehension of**
- the factors influencing the absorption of drugs;
- the factors influencing the distribution and disposition of drugs in the body;
- the principles of drug metabolism and elimination;
- the production and use of powders, tablets and capsules;
- the formulation and use of suspensions;
- The principles underlying the production and use of foams;
- the formulation, properties and uses of aerosols;

**developed skills in the areas of**
- performing pharmaceutical calculations;
- the preparation of pharmaceutical dose forms;

**an appreciation of**
- the need for accuracy and thoroughness in the preparation of pharmaceutical products;
- the factors which influence the design of pharmaceutical dose forms.

SYLLABUS

*Biopharmaceutics.* pH-partition hypothesis, properties of membranes, and mechanisms of drug transfer across membranes, effects of ionization state, plasma protein binding of drugs, distribution and disposition of drugs, apparent volume of distribution, factors affecting drug accumulation in tissues, drug half-lives, pharmacokinetic modelling.

*Tablets and powders.* Particle size and distribution, particle size determination, flow properties. Mixing and mixers, granulation, tablets, manufacturing processes, special tablets, weight, content and physical uniformity, excipient interaction, in vitro testing, in vitro-in vivo correlations.

*Disperse systems.* Colloidal systems, kinetic, optical, electrical properties of solid-liquid dispersions, electrical and steric stabilization of solid-liquid dispersions, nucleation and ageing.

*Foams.* Stability of foams, choice of surfactant, antifoaming agents.

*Aerosols.* Liquified and compressed aerosol propellants; two phase aerosols; three phase aerosols; aerosol formulation; aerosol stability; non-pressure pack aerosols, atomisers, packaging, containers.

Practical

19 × 3 hours of practical sessions to teach the skills required in the preparation of certain pharmaceutical dose forms and to reinforce the principles of pharmaceutics covered in the lecture series.

Textbooks


Pharmaceutics II Laboratory Manuals: Victorian College of Pharmacy, 1993.


References


Pharmaceutical Research.


United States Pharmacopoeia. 22nd revision. USP Convention, 1990.
ASSESSMENT

The final Pharmaceutics II assessment is made up of the following components:

- Mid-year examination (June); 1 hour 20%
- Practical work 10%
- End-of-year examination; 2½ hours 70%
PHARMACEUTICAL CHEMISTRY II

A course of 72 lectures, 13 tutorials and 66 hours of practical work. (An additional 6 hours of practical work is taught in conjunction with Pharmacy Practice.)

The aim of the course is to build on the basic physical and organic chemistry taught in Pharmaceutical Chemistry I, and to apply it to aspects of chemistry relevant to Pharmacy. Major topics include Clinical and Analytical Chemistry, Biological Chemistry and Medicinal Chemistry. In the first of these areas, the physical and instrumental techniques used in determining the identity, purity and concentration of drugs are examined. Various diagnostic tests involved in determining chemical substances implicated in disease states are also described, as are applications of radiopharmacy. In Biological Chemistry, concepts of thermodynamics are discussed in a biological context, as are features of the three-dimensional structures of proteins. The role of enzymes in drug action is also examined. In Medicinal Chemistry the relationship between the structure and activity of drugs is investigated.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

- the nomenclature and meaning of terms used to describe the three-dimensional structures (stereochemistry) of drug molecules;
- spectroscopic methods used in the analysis and structure determination of drugs;
- the theory and application of thermodynamics as applied to drug binding, conformational analysis and biochemical energetics;
- the structural and mechanistic bases for the action of the autonomic neurotransmitters and related agents;
- factors affecting the physicochemical properties and reactivity of drugs based on aromatic frameworks;
- nomenclature pertaining to and factors influencing the three-dimensional structures of proteins;
- the partition of substances between various phases as applied to both the analysis of drugs and their transport in the body;
- principles of electrochemistry applied in the analysis of drugs;
- the chemical principles underlying selected diagnostic aids relevant to pharmacy;
- the application of radioisotopes in pharmacy;
- the chemical principles relevant to the activity of selected antiviral compounds;

developed skills in the areas of

- the measurement and recording of data relevant to the understanding of drug structure and reactivity;
- numerical calculations based on experimental or theoretical data;
report writing or oral presentations based on the results of experimental work;

an appreciation of

the general chemical principles of enzymatic catalysis;
the importance of chemical reactions in determining drug transport and metabolism;
the application of the principles of medicinal chemistry to the search for selectivity in therapeutic agents.

SYLLABUS

*Stereochemistry.* Molecular geometry, symmetry, isomerism, configuration, conformation, conformational analysis; the use of conformationally restricted analogues in determining receptor structure and the shape of active drugs; preparation of homochiral compounds, implications of stereochemistry for drug design and delivery.

*Spectroscopy.* NMR, IR, UV spectroscopy, mass spectrometry: underlying processes and applications in the pharmaceutical industry; interpretation of spectra; identification of compounds using spectroscopic techniques.

*Aromatic Chemistry.* Differences between aromatic and aliphatic compounds; resonance theory and stabilization, acid/base properties; linear free-energy relationships, Hammett plots, sigma and rho values, effect of substituents on drug stability; steric effects; structure-activity relationships in local anaesthetics; heterocyclic aromatic compounds: nomenclature and properties, role of heterocyclic compounds in biological systems.

*Receptor Structure.* Chemistry of the peptide bond; factors affecting primary, secondary and tertiary structure of proteins; functional groups involved in binding of drugs to protein; thermodynamics of drug binding, stereochemistry, drug binding and the three-dimensional structure of proteins; techniques involved in determining protein structure.

*Chemistry of Enzymes.* Catalysis of reactions, particularly ester and amide hydrolysis; pH rate profiles; transition-state stabilization, general acid and general base catalysis, nucleophilic catalysis, metal-ion catalysis, and their role in reactions catalysed by enzymes; pyridoxal phosphate dependent enzymes; enzymes as targets for drugs.

*Electrochemistry.* Activity, ionic strength, junction potentials; Debye-Hückel theory, Fergusson principle for drug equi-action; ion-selective electrodes, pH measurements, amperometric electrodes, and their role in pharmacy/clinical chemistry; composition of pharmaceutical glasses; biological cell potentials.

*Partition and Chromatography.* Liquid-liquid distribution, extraction efficiency; principles underlying HPLC, gas, gas-liquid, partition and thin-layer chromatography; relationship between pH, drug structure, dissolution medium and drug distribution.

*Diagnostic Aids.* Sampling techniques, clinical stick devices, tests for nitrate, pH, glucose, protein and cholesterol, and their clinical significance; tests for enzymes and lipoproteins; drug interferences in clinical tests.
Radiopharmacy. Types and units of radiation, maximum doses, background radiation; protection required for different forms of radiation; technetium generators and production of isotopes of pharmaceutical interest; preparation of radiopharmaceutical dose forms; X-ray and radio-isotopic imaging; the use of isotopes in sterilization.

Antivirals. Targets for antiviral therapy and their relationship to structural features of antiviral drugs; structure, mode of action and uses of acyclovir, azidothymidine and ribavirin.

Autonomic Nervous System Agents. Cholinergic system: muscarinic and nicotinic receptors; structure and activity of acetylcholine and acetylcholinesterase; reversible and irreversible inhibition of acetylcholinesterase; treatment of anticholinesterase poisoning; cholinergic blocking agents and their use as muscle relaxants; degradation of muscle relaxants. Adrenergic system: structure and function of noradrenaline; inactivation of noradrenaline by monoamine oxidase and catecholamine-O-methyl transferase; α- and β-adrenoceptors; chemistry of α-adrenergic antagonists; chemistry and selectivity of β-active agents.

Thermodynamics. Reversible, irreversible and spontaneous processes; disorder, entropy, free energy; equilibrium constants; entropy and enthalpy driven processes; coupled reactions; measurement of ΔG; Gibbs-Helmholtz equation; Kirchoff’s equation; calculation of free-energy changes, van’t Hoff plots; applications of thermodynamic concepts to biochemical reactions, conformational equilibria, phase transitions, and drug-receptor interactions.

QSAR. The value of non-traditional approaches to drug design; Hammett, Hansch and Taft constants; use of pK_a, partition and hydrolysis data to predict drug stability; multiparameter and non-mathematical approaches.

Textbooks


References


Fersht AR. Enzyme Structure and Mechanism. 2nd ed. Freeman, 1985.


**Practical**

A course of 66 hours of practical work designed to reinforce chemical principles taught in the lecture series and to illustrate the analytical bases of quality assurance for pharmaceutical products. Emphasis is placed on technique and general methods. Performance in laboratory classes is taken into account in assessing students' results in this subject.

**Textbook**


**References**


**ASSESSMENT**

The final Pharmaceutical Chemistry II assessment is made up of the following components:

- Mid-year examination (June); 2 hours  25%
- Practical work  10%
- End-of-year examination; 3 hours  65%
PHARMACEUTICAL PHARMACOLOGY II

The overall course consists of two components (i) a section dealing with systematic pharmacology and (ii) a basic course in biochemistry.

The principal aim of the pharmacology course is to provide students with a knowledge of systematic pharmacology based on drug groups and to extend physiological and pathophysiological concepts in relation to the uses of drugs, their mechanisms of action and their side effects.

The aim of the biochemistry course is to provide students with an understanding of biochemistry and of biochemical concepts as a base for later work in other subjects within the pharmaceutical sciences.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a knowledge and comprehension of

- principles of receptor differentiation, drug-receptor interactions and receptor-transduction mechanisms;
- pharmacological mechanisms by which drugs of various classes may alter biochemical, physiological or pathophysiological parameters to produce therapeutic or unwanted effects;
- the particularities of the pharmacological, toxicological and pharmacokinetic properties of individual compounds within drug classes as they impinge on their therapeutic use;
- the basic biochemistry of body constituents, metabolism, regulatory mechanisms and molecular biology;

developed further skills in the areas of

- observation and measurement of pharmacological and biochemical processes;
- assessment and integration of pharmacological information as it relates to wanted and unwanted effects produced by drugs;

an appreciation of

- integrated physiological functions, pathophysiological sequelae and pharmacological perturbations as they affect bodily functions;
- the differing pharmacological approaches available for the treatment of individual diseases;
- the pharmacists' role in optimizing drug therapy.

SYLLABUS

Pharmaceutical pharmacology

A course of 78 lectures, 10 tutorials and 48 hours of practical work.

Pharmacology of neuroeffector systems. Humoral transmission. Historical background. Synthesis, storage, release, metabolism and termination of action of

**Autacoids.** Synthesis, storage, release, metabolism and pharmacological actions of substances such as histamine, 5-hydroxytryptamine, kinins, prostaglandins and various peptides. Substances released during anaphylaxis. Antigen-antibody reactions as they affect allergic and inflammatory states. Drugs used in the treatment of allergies, acute inflammatory conditions and collagen diseases.


**Cardiovascular physiology and pharmacology.** The heart, origin and conduction of excitation, effects of vagal and sympathetic stimulation on SA node, AV node and conducting tissue. The normal electrocardiogram, bipolar and unipolar leads, cardiac muscle and conducting tissue action potentials, the pumping action of the heart. Effects of vagal and sympathetic stimulation on cardiac contractility. Cardiac output, its measurement and regulation. Circulation. Haemodynamics, pressures and flow in arteries, capillaries and veins. the systemic circulation, nervous and humoral control, auto-regulation. Blood flow through special regions, the pulmonary, coronary, splanchnic, muscle and skin circulation. Integrative analysis of the circulation. Calcium in cardiac and vascular smooth muscle, calcium antagonists, potassium channel openers. Hypertension, consequences of hypertension and its treatment.


**Practical**

*In vivo and in vitro* experiments, seminars and discussion groups to illustrate and extend principles discussed in the lecture course.
Textbooks


References


Biochemistry

A course of 26 lectures, 3 tutorials and 18 hours of practical work.

Chemistry of Biological Compounds

*Carbohydrates*. Definition; functions; classification; monosaccharides, optical isomerism, aldoses and ketoses, ring structures, phosphate esters, acid and amine sugars, chemical properties; structures of disaccharides and polysaccharides.

*Lipids*. Definition, classification; functions; neutral fats, saturated and unsaturated fatty acids; waxes; phospholipids; spingomyelins; cerebrosides; steroids; fat-soluble vitamins; serum lipoproteins.

*Proteins*. Definition; structures and classification of amino acids; zwitterions; chemical reactions; peptide bonds; primary structure of proteins; properties due to side chains, electrophoresis; chain conformation; quaternary structure; denaturation; classification.
**Nucleic acids.** Definition; purine and pyrimidine bases, nucleosides, nucleotides, structure of DNA and RNA; nucleoproteins.

**Metabolism**

**Enzymes.** Definition; physical factors influencing reaction rates; specificity; mechanism of action; Michaelis-Menten kinetics; inhibition; classification; cofactors; allosteric enzymes.

**Bioenergetics.** Concept of free energy change; energy rich compounds; coupled reactions; oxidative phosphorylation; inhibitors.

**Digestion.** Action of enzymes secreted into mouth, stomach, small intestine; action of bile salts; absorption of monosaccharides, amino acids and lipids.

**Carbohydrate metabolism.** Embden-Meyerhof pathway; anaerobic glycolysis; tricarboxylic acid cycle; net ATP production; glycogenesis; glycogenolysis; pentose phosphate pathway; gluconeogenesis; hormonal regulation.

**Lipid metabolism.** Beta-oxidation of fatty acids; ketogenesis; ATP production; fatty acid synthesis; cholesterol synthesis; relationship of serum lipids to atherosclerosis; drugs controlling serum lipids; hormonal influences.

**Amino acid and protein metabolism.** Essential amino acids; transamination; deamination; urea formation; fate of carbon skeleton; inborn errors of metabolism; precursor functions and amino acids.

**Molecular biology.** DNA as genetic material; DNA synthesis; mutagenesis; DNA repair; recombinant DNA; genetic code; RNA and protein synthesis.

**Regulatory mechanisms in control of cell metabolism.** Cell compartmentation; regulation of enzyme protein synthesis and degradation; activation and deactivation of pre-existing enzymes.

**Practical**

Experiments and discussion groups to illustrate and extend principles discussed in the lecture course.

**Textbooks**


**References**


ASSESSMENT

The final Pharmaceutical Pharmacology II assessment is made up of the following components:

- Mid-year examination (June); 1 hour 11%
- Biochemistry examination (June); 1½ hours 25%
- Practical work 11%
- End-of-year examination; 3 hours 53%
PHARMACEUTICAL MICROBIOLOGY

A course of 78 lectures, 13 tutorials and 60 hours of practical work.

The aim of the course is to provide students with a detailed knowledge and understanding of the pharmaceutical aspects of microbiology, immunology, parasitology, general pathology and basic epidemiology.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

- the structure and classification of bacteria, viruses, fungi and parasites of medical importance;
- the techniques used to propagate and selectively culture micro-organisms;
- the nature of medically important parasites and the diseases caused by them;
- the basic principles of microbial genetics and the mechanisms of gene transfer;
- the essentials of recombinant DNA technology;
- the structure and function of the immune system and its role in disease processes;
- the essential aspects of general pathology;
- the nature and uses of antiseptics, disinfectants and preservatives;
- sterilisation methods and contamination control;
- the diseases of medical and veterinary importance caused by microorganisms;
- the principles of epidemiology;
- the nature and uses of anti-microbial agents;

developed skills in the areas of

- handling and culturing microorganisms;
- conducting certain diagnostic tests;
- preventing contamination of pharmaceutical products;

an appreciation of

- the need for care, accuracy and thoroughness in the manufacture of sterile pharmaceutical products;
- the factors which influence the spread, course and control of diseases of microbial origin.

SYLLABUS


Mycology. Classification of fungi, medical mycology, pathological reactions to fungi, antifungal agents, selective toxicity, fungi useful to humanity.

Parasitology. Parasites of medical importance; protozoa, human threadworm and its treatment, tapeworms, hematode worms. Anthelminthics. Mites, lice, ticks.


Antisepsis. Nature of, and principles governing, the mechanism of action and use of antisepsics, disinfectants and preservatives.

Sterilisation. Principles and practice of sterilization (filtration, heat, chemical, radiation), aseptic dispensing and sterility assurance. Control of particle and pyrogen levels.

Contamination control. Microbial contamination of the workplace: industrial, hospital and home environment. Aseptic techniques, monitoring contamination, clean room design and function.

Anti-microbial agents. Selective toxicity and spectrum of antimicrobial activity. Classification of antibiotics and allied drugs. Concept of rational chemotherapy vis a vis identity of pathogen, acute/chronic/recurrent infections, site of infection, resistance, adverse drug reactions, laboratory control. Role of best-guess therapy, antibiotic prophylaxis and combinations, supportive treatment, immune system involvement; side effects, precautions, counselling, antibiotic guidelines.
Biotechnology. Recombinant DNA technology, peptide and protein drugs, gene therapy, transgenic animals, gene probes, biopharmaceuticals.


Practical
15 × 4 hours of practical classes to reinforce the principles covered in the lecture series and to teach the skills required for the preparation of sterile pharmaceutical products and the handling and culture of microorganisms.

Textbooks

References

**ASSESSMENT**

The final Pharmaceutical Microbiology assessment is made up of the following components:

- Mid-year examination (June); 2 hours: 20%
- Practical work: 15%
- End-of-year examination; 3 hours: 65%
PHARMACY PRACTICE II

A course of 13 lectures, 8 tutorials and 27 hours of practical work.

This course follows on from Pharmacy Practice I but concentrates more on the patients and their environment with particular attention spent on communications skill between pharmacist and patient. These skills will be developed to a much greater depth than in the first year course. It also introduces the concept of problem-solving from the point of view of pharmacist/patient/provider interactions and the role of the pharmacist in intervening in the therapeutic situation. The practical sessions will concentrate on allowing the student to reach high levels of competence in counselling and problem-solving situations.

Accordingly, the major aims of this course are to provide students with a knowledge and understanding of the principles of counselling, illness behaviour, compliance and problem solving situations in the therapeutic environment.

Thus, the course is designed to further instil into the students an ability to express concern, compassion and sensitivity in patient care through a better understanding of communication skills. It also aims to allow the student to acquire intervention skills to ensure most effective therapy.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

the methods of effective communication with patients and providers;
the barriers to effective communication;
the problems of non-compliance and means of overcoming them;
patient education in the broad sense of the pharmacist being a health provider;
illness behaviour, normal and abnormal;
the placebo effect and how it fits into pharmacy practice;
the concepts of self, role and the sick role;

developed skills in the areas of

written and oral communication;
counselling;
problem-solving in clinically oriented situations;
the recording of prescriptions and the use of patient profiles through the use of pharmacy computers;

an appreciation of

the relationships existing between drugs, medicines, patients and society;
problem-solving in clinically oriented situations and an awareness of the pharmacists’ role in therapeutic intervention.
SYLLABUS

Counselling and communications. Communication skills, professional/patient communication, professional/professional communication. Listening skills, barriers to communication, rapport, empathy, interviewing skills. Advanced counselling skills.

Patient compliance. The problem of non-compliance to health oriented regimens. Statistics and reasons for non-compliance to therapeutic regimens. The patient, the health provider, the social milieu, the therapeutic regimen, the Health belief system. Methods of improving compliance.


Illness behaviour. What is illness behaviour? Parson’s concept of role; the sick role; the well role. Social class and the sick role. Mechanic’s Help Seeking Process. Suchman’s five stages of the illness experience.

The placebo. Historical perspective, definitions, incidence, mechanisms, practitioner behaviour and placebo effect, patient characteristics and placebo effect, patient-practitioner communication and placebo effect, situational determinants of placebo effects, social norms and the placebo effect, generalisability and the placebo effect, the placebo as a methodological tool, alternative therapies and the placebo effect.

Practical

Practical classes consisting of dispensing, sessions in communication and counselling, oral presentations (following on from Pharmacy Practice I), prescription-solving situations and computers in pharmacy will be held. In addition, sessions on aspects of pharmaceutical chemistry related to the practice of pharmacy and a pharmaceutical industrial visit will be organised.

Textbooks

Human Behaviour text prescribed for Pharmacy Practice I.


**References**

*Australian Journal of Hospital Pharmacy*

*Australian Journal of Pharmacy*

*Australian Pharmacist*

*Australian Prescriber*


**ASSESSMENT**

The final Pharmacy Practice II assessment is made up of the following component:

- Open book practical examination (October); 3 hours 100%

The theoretical aspects of the lectures on counselling, social pharmacy and illness behaviour will be examined in the Pharmacy Practice III annual examination.

Dispensing: Students are required to reach a satisfactory level of competence in dispensing by the end of the course.
PHARMACEUTICS III

A course of 81 lectures and 55 hours of combined practical work and tutorials.

The aim of the course is to provide students with a detailed knowledge of the interaction between the dose form and the patient and to provide a knowledge of the factors affecting drug product stability.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of
- the use of pharmacokinetics to control administration of drugs;
- factors affecting bioavailability;
- measurement of bioavailability;
- biological and dose-form related factors affecting the delivery of drug via common routes;
- factors affecting dose-form stability;

developed skills in the areas of
- performing pharmaceutical and pharmacokinetic calculations;
- the preparation of sterile dosage forms;

an appreciation of
- the importance of understanding the dose-form in optimizing use of drugs;
- the importance of understanding the physiology and anatomy of the patient in optimizing the use of dose forms;
- the importance of proper evaluation of dose-forms.

SYLLABUS


Therapeutic Drug Monitoring. Prediction of dosage, use of population parameters, bayesian and probability methods.

Bioavailability. Definition, measurement of bioavailability, design of bioavailability studies, generic equivalence, dissolution testing.

Biopharmaceutics of the following dose routes. Peroral, buccal, rectal, percutaneous, ocular, nasal, vaginal, parenteral.

Drug Interactions. Pharmacokinetics of drug interactions involving absorption, distribution, metabolism and excretion.

Industrial Pharmacy. The role of the pharmacist in the pharmaceutical industry. The code of Good Manufacturing Practice. Total Quality Management. Statistical process control.
Drug Stability. Physical stability of selected dose forms, non-chemical loss; shelf-life, storage conditions, accelerated stability testing, stability trial design; chemical stability, pH-rate profiles, hydrolysis, profiles of esters and amides; oxidation, photolysis; procedures for stabilisation; parenteral formulation design.

Practical Pharmaceutics III

Sterile dispensing, formulation exercises and biopharmaceutics tutorials.

Textbooks

Students should retain textbooks utilised in earlier years of the course.

ASSESSMENT

The final Pharmaceutics III assessment is made up of the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Practical work</td>
<td>10%</td>
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<tr>
<td>End-of-year examination; 3 hours</td>
<td>90%</td>
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PHARMACEUTICAL CHEMISTRY III

A course of 52 lectures and 50 hours of practical work.

The aim of the course is to cover the medicinal chemistry of current therapeutic agents. Aspects that are significant for the practice of pharmacy are emphasised.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have

a detailed knowledge and comprehension of

the relationship between the chemical structure and biological activity of drugs and endogenous substances;

mechanisms of drug action at a molecular level;

the physicochemical basis for drug presentation and formulation;

absorption, distribution, metabolism and excretion of drugs from a chemical perspective;

developed skills in the areas of

recognising drug moieties important for drug-receptor interactions;

applying chemical rationale to devising alternative forms of drug presentation;

using chromatographic techniques for therapeutic drug monitoring;

an appreciation of

modern drug design and development;

computer-graphics techniques in pharmaceutical science;

the chemical basis for drug toxicity and drug interactions;

biological applications of spectroscopic techniques.

SYLLABUS

Drug design. Theories and mechanisms of drug action, drug-receptor interactions, optimisation of drug response, application to recently developed drugs. NMR studies of protein-ligand interactions in drug design.

Drugs affecting the central nervous system. The structure-activity relationships and molecular conformation of CNS transmitter substances, analgesics, sedatives, hypnotics, antipsychotics, anti-Parkinson agents, antidepressants, stimulants and hallucinogenic agents.

Steroids and prostaglandins. Structural relationships and functions of the steroid hormones, glucocorticoids, mineralocorticoids, anti-inflammatory agents, sex hormones, prostaglandins and related agents.

Pharmacodynamic agents. The structure and function of cardiovascular drugs, antihypertensive agents, coagulants and anticoagulants, plasma-extenders, diuretics, hypoglycaemic agents, non-steroidal anti-inflammatory agents, thyroid hormones and antithyroid agents.
Enzyme inhibitors as drugs. This lecture series examines the action of a number of clinically useful enzyme inhibitors with a view to understanding their mode of action. The importance of understanding enzyme mechanisms is emphasised, particularly as related to the rational design of new and specific therapeutic agents.

Anti-infective agents. The structure, function and mode of action of the antibiotics, sulphonamides, antitubercular, antimalarial and other antiprotozoal agents.

Detoxifying agents. Chelation therapy in the treatment of heavy-metal poisoning and specific disease states.

Peptides. The development of the therapeutic potential of peptides as drugs; structural modifications to endogenous and other peptides leading to increased selectivity, potency and in-vivo stability.

QSAR. Case studies in the application of QSAR concepts to the development of new drugs. Quindone antimicrobial agents and atypical antipsychotics.

Textbook

References

Practical
The synthesis, identification and characterisation of compounds of medicinal interest.

The use of analytical and spectroscopic instrumentation in the analysis of drugs and their metabolites.

The use of computers in structure-activity relationships and drug design.

Emphasis is placed on technique and general methods. Students are expected to show initiative in organising their work. Performance in laboratory classes is taken into account in assessing students' results in this subject.

Students are required to wear safety glasses and laboratory coats when attending practical classes in the chemistry laboratories.
Textbooks


Reference


ASSESSMENT

The final Pharmaceutical Chemistry III assessment is made up of the following components:

- Practical work 15%
- End-of-year examination; 3 hours 85%
PHARMACEUTICAL PHARMACOLOGY III

A course of 81 lectures and 60 hours of practical work.

The aim of the course is to (i) extend the knowledge of students in areas of systematic pharmacology not covered in the Pharmaceutical Pharmacology II course, (ii) provide students with a greater knowledge of disease states and the rational treatment of these diseases by drugs and (iii) consider biological aspects of drug development.

GENERAL OBJECTIVES

By the end of the teaching programme the students should have:

a knowledge and comprehension of

- principles of receptor differentiation, drug-receptor interactions and receptor-transduction mechanisms;
- pharmacological mechanisms by which drugs of various classes may alter biochemical, physiological or pathophysiological parameters to produce therapeutic or unwanted effects;
- the particularities of the pharmacological, toxicological and pharmacokinetic properties of individual compounds within drug classes as they impinge on their therapeutic use;
- the basic biochemistry of body constituents, metabolism, regulatory mechanisms and molecular biology;
- common disease states and their aetiology;
- the rational approach to the treatment of these diseases by drugs, drug choice in relation to individual patients and non-drug treatment modalities;

developed further skills in the areas of

- observation and measurement of pharmacological and biochemical processes;
- assessment and integration of pharmacological information as it relates to wanted and unwanted effects produced by drugs;

an appreciation of

- integrated physiological functions, pathophysiological sequelae and pharmacological perturbations as they affect bodily functions;
- the differing pharmacological approaches available for the treatment of individual diseases;
- the pharmacists' role in optimizing drug therapy;
- social aspects of pharmacology, the abuse and misuse of prescription and non-prescription drugs and other chemicals;
- biological aspects of drug development, toxicity testing, clinical trials and drug registration;
- the integration of knowledge as it applies to the role of the pharmacist in the health team.
SYLLABUS

Pharmaceutical Pharmacology

Endocrinology. Hypothalamic and feedback controls on the release of anterior and posterior pituitary hormones. The physiology of growth hormone; prolactin; thyroxine and triiodothyronine; corticosteroids; oestrogens, progestagens and androgens; vasopressin and oxytocin; insulin and glucagon; parathyroid hormone, calcitonin and vitamin D. Endocrine disorders, their pathophysiology and treatment. The use of natural and synthetic hormones and drugs which alter endocrine function; antithyroid, antidiabetic and antifertility agents.

Pharmacology and therapeutics. The physiology and pathology associated with disease states and clinical conditions in various organs and body systems as a background to sites for potential pharmacological activity; the pharmacology of drug groups and individual drugs within these groups as a basis for rational drug therapy and the understanding of side-effects; comparisons between pharmacological and non-pharmacological interventions in disease treatment and the rational matching of pharmacological treatments with individual patient profiles. Cardiovascular diseases; arrhythmias, peripheral vascular disease, ischaemic heart disease, shock and congestive heart failure. Gastroenterology; antiulcer drugs, laxatives, antidiarrhoeal agents. The respiratory tract; asthma, bronchitis, bronchodilators, expectorants, mucolytics. Inflammatory disorders, rheumatoid arthritis, gout; non-narcotic analgesics, anti-inflammatory agents, uricosuric agents. Uterine relaxants and stimulants. Bladder, disorders of micturition. Drugs acting on cell division. The chemotherapy of cancer, carcinogens and immunosuppressant agents.

Central nervous system physiology, pharmacology and therapeutics. The reticular formation, wakefulness and limbic system. The EEG; sleep and epilepsy; antiepileptic drugs, hypnotics, sedatives and anaesthetics. Disorders of locomotion. Aetiology and therapy of Huntington’s chorea. Parkinson’s disease and spasticity. The role of limbic system, medulla and hypothalamus in the regulation of temperature, food and water intake, coughing, vomiting, respiration, emotion and behaviour. Antipyretics, anorectics, antitussives, emetics and antiemetics, respiratory stimulants, analeptics. Psychiatric disorders and their treatment, tranquilizers, antidepressants, psychomotor stimulants. Narcotics and narcotic analgesics. Headache.

Drug abuse and misuse. Dependence, addiction, tolerance, desensitization. Dependence characteristics and treatment of abuse of hallucinogens, cocaine and other stimulants, alcohol and cannabis, barbiturates and other depressants, narcotics, tobacco and volatile agents.

Developmental pharmacology. Selection of target molecules; pre-clinical evaluations; phase I, II and III clinical trials; governmental requirements; post-marketing surveillance; iatrogenic disease, drug interactions. Toxicity testing of drugs and other chemicals, epidemiology; environmental toxicology and industrial diseases.
Practical

In vivo and in vitro experiments, seminars and discussion groups to illustrate and extend principles discussed in the lecture course.

Textbooks and references

As under Pharmaceutical Pharmacology II. In addition the following books are recommended as references.


ASSESSMENT

The final Pharmaceutical Pharmacology III assessment is made up of the following components:

Tests 10%
Practical work 15%
End-of-year examinations; 2 x 2 hours 75%
PHARMACY PRACTICE III

A course of 98 lectures, tutorials and symposia, 30 hours of practical work, and an 80 hour individual student project.

The aim of the course is to provide students with a knowledge and understanding of a range of subjects of importance to the practice of pharmacy. It should be noted that many of the listed lectures will be in the form of problem-solving situations to tie together all the subjects taught within the Bachelor of Pharmacy course to best benefit the patient.

GENERAL OBJECTIVES

By the end of the teaching programme students should have

a detailed knowledge and comprehension of

the role of pharmacists in primary health care, with particular references to pain, skin care and skin, diseases of the gastrointestinal tract, reproductive disorders, diseases of the respiratory tract and problems of reproduction;

the legislation that is applicable to drugs, medicines, poisons and the practice of pharmacy;

the sources of drug information and methods used to retrieve and then present this information in both the oral and written formats;

the role of pharmacists in nutrition, including parenteral nutrition and therapy;

the use and abuse of chemicals commonly used in the community;

the common diseases of animals which fall within the scope of the practice of pharmacy;

the role of metals in therapeutics and toxicology;

the methods used to deal with accidental and/or intentional poisonings;

developed skills in the areas of

responding to presenting symptoms;

problem-solving in practice-orientated situations;

communication and counselling;

an appreciation of

the role of pharmacists in primary health care;

the provision of drug information by pharmacists;

the provision of other services by pharmacists;

some aspects of staff management and customer relations.

SYLLABUS

Drug Information. Chemical and drug information systems; National Drug Information Service; drug data bases; retrieval of information; provision of drug information, use of such information in report writing.
Veterinary Pharmacy. Comparative anatomy and physiology; diseases transmitted from animals to man; veterinary dose forms; common diseases of domesticated animals; the role of the pharmacist in animal care.

Poisons and Antidotes. Poisons information centres; accidental poisonings; intentional poisonings; principles of first aid; specific poisons and antidotes.

Nutrition. The role of pharmacists in nutrition; information sources; the good diet; hazards of food products; use and abuses of vitamins; nutrition and obesity; breast feeding and milk products; intravenous and enteral nutrition.

Forensic Pharmacy. Legislation applicable to drugs, medicines, poisons and pharmacy generally including the following Acts and Regulations: Pharmacists Act, Drugs, Poisons and Controlled Substances Act, Health Act, National Health Act, Animal Preparations Act, Therapeutic Goods Act; legal and professional responsibilities; professional conduct; pharmacy organisations in Australia.

Metals in medicine. Use of metals from the therapeutic/clinical and toxicological aspects. Myths and controversies surrounding the ingestion of various metal "nutrients".

Customer Relations and Personnel Planning. The pharmacist and client; interaction with clients, colleagues and other health professionals; selection of staff through interviews; staff counselling.

Chemistry in the Home. Garden products, insecticides, herbicides, pesticides; swimming pools, chlorination, pH monitoring; food additives, sweeteners, preservatives, dyestuffs, colours, fixing; plastics, containers, adhesives, disposal of chemicals, photography.

Primary Health Care. Responding to symptoms; taking a history, questioning, communication with the patient and other professionals; pain and its meanings; skin care and diseases, common skin ailments, treatment, sunscreens and sunburn, wound healing, wound-dressings, hair care, nail care, skin care, cosmetics; respiratory diseases, asthma and other chronic respiratory diseases, cough and cold treatments, eyes, contact lenses, earache, ear wax, epistaxis; gastrointestinal diseases, mouth ulcers, toothache, dyspepsia, gastroenteritis, vomiting, diarrhoea, constipation, anorectal conditions; reproductive health, contraception, pregnancy, diagnostic tests, dysmenorrhoea, premenstrual tension, menopause, hormone replacement therapy, thrush.

Pharmacy Project. An 80 hour project to be undertaken by all students. The project will be laboratory, library or community based. Students will be given extensive handouts as to the requirements of the Project in the first week of first semester.

Practical

30 hours of practical sessions to teach the skills required in providing primary health care, drug information, computers in pharmacy, counselling, problem-solving situations such as inappropriate dosages, drug interactions, etc., dispensed medicines and advice on other professional matters.
Textbooks


References

*Australian Pharmacist*

*Australian Prescriber*

*Current Therapeutics*

Pharmaceutical Society of Australia (Victorian Branch) Bulletin

Smith MC, Knapp DA. *Pharmacy, Drugs and Medical Care.* 5th ed. Williams & Wilkins, 1992.


ASSESSMENT

The final Pharmacy Practice III assessment is made up of the following components:

- Forensic Pharmacy examination (June); 2 hours 15%
- End-of-year written examination on core material*; 3 hours 35%
- End-of-year open book laboratory based examination; 2½ hours 25%
- Project 25%

* It should be noted that the 13 lectures given in Pharmacy Practice II on Counselling, Social Pharmacy and Illness Behaviour will be examined in this paper.

Dispensing: Students are required to reach a satisfactory level of competence in dispensing by the end of the course.
Practical Training and Final Examination

Having completed the requirements for the Bachelor of Pharmacy degree, in order to register as a pharmacist, graduates must complete a period of practical training and pass the Final Examination conducted by the Pharmacy Board of Victoria.

A prerequisite to entering for the Final Examination is that practical training has been undertaken under conditions laid down by the Board, and in premises approved by the Board. Students should check with prospective tutors that the training arrangements have received Board approval.

Pharmacy Board of Victoria (Constituted 1876)
R P Cohen, PhC, MPS, MIPharmM, FAIPM President
M G Blachford, PhC, MPS
M Gandolfo, PhC, MPS, Treasurer
S W Kirsa, BPharm, MPS
J A Mitchell, PhC, FPS
N W Naismith, PhC, MPS, FSHP
P E Nieman, BPharm, MPS
B L Reed, BPharm, PhD, PhC, FPS, MIBiol, MIPharmM, FAIPM, MSHP, MACPP
L Roller, BPharm, MSc, PhD, DipEd, PhC, FPS, AMPsS, MACPP
A I K Lloyd, RFD, ED, PhC, FPS, FAIPM, JP, Registrar
S N Leyshon, BEc, AU(A(Pharm), DipEd, MPS, AASA, CPA Deputy Registrar

Functions of Board and Society

The Pharmacy Board of Victoria is a statutory body constituted by Act of Parliament and answerable to the Victorian State Parliament through the Minister of Health. The Board meets and has its administrative offices at the Victorian College of Pharmacy.

The Board approves the prescribed subjects to be studied by students undertaking the pharmacy course, is responsible for the control and direction of all examinations in pharmacy, attends to the registration of pharmacists, supervises the practical training of students and trainees including the registration of articles of traineeship, approves tutors and premises for training and issues students' record books. The Board's function is to act primarily in the interests of the public. The Registrar of the Board is also the Executive Director of the Pharmaceutical Society of Australia (Victorian Branch) Ltd.

The Pharmaceutical Society on the other hand is a professional society incorporated under articles of association. The affairs of the Society are administered by a Council of twelve members. The pharmacists of Victoria comprise the membership of the Society. The Society's function is to act primarily in the interest of the pharmacists who are its members. For nearly a century the Pharmaceutical Society owned and operated the College which taught students of pharmacy in a school recognised by the Pharmacy Board.
In 1976 the Council of the Pharmaceutical Society of Australia (Victorian Branch) Ltd determined to establish a new and separate Council to administer the affairs of the College. The new Council assumed its responsibilities on 1 January 1977.

Practical training

The period of practical training prescribed by the Regulations is 2280 hours of which at least 1824 must be served as a trainee under articles, while the remainder may be served during undergraduateship without being articled. It is considered most desirable for students to complete the first 456 hours training prior to attempting the Pharmacy III examination. In all circumstances the practical training must be served in continuous periods of not less than 132 hours nor more than 180 hours, in any four week period with the one tutor.

The Board will approve the whole period of practical training to be undertaken in a community pharmacy, a Friendly Society dispensary, or a hospital (i.e. public, private, veterans or military). The Board will approve a maximum of 1440 hours undertaken in a school of pharmacy, a university department of pharmacology or the laboratory of a pharmaceutical manufacturer.

The tutor for each trainee and the premises where the practical training is to be carried out is required to be approved by the Board in each particular case.

The Board encourages undergraduates and graduates to obtain practical training in more than one area of pharmacy, preferably in community, hospital and industrial practice. This offers a broader and more valuable experience in practical training.

Graduates who wish to proceed to registration as a pharmacist are advised to read Sections A and F of the Guideline on 'Registration' in the current edition of the Pharmacy Board of Victoria Guidelines, obtainable from the Board's office.

First aid training

Applicants for registration as a pharmacist are required to have completed, within the last three or four years, a Level 2, Basic First Aid Course, or other first aid course acceptable to the Board.

Articles

Articles of traineeship may only be entered into after passing the Pharmacy III Examination. The form of agreement, which must be completed in triplicate, is available from the office of the Board. A statutory fee is charged for the registration of articles of traineeship.

Final Examination

The syllabus is as follows:

Practical Pharmaceutics

This is a three hour test conducted in the School of Pharmaceutics by the Pharmacy Board in co-operation with the academic staff.

Candidates will be required to exhibit well developed skill in the preparation and presentation of extemporaneously prepared pharmaceutical products and in dealing with problems involved with the dispensing of prescriptions. Appreciation and
resolution of contemporary problems in modern medication is also expected. Candidates are required to write a concise but accurate and intelligible record of all relevant quantitative and qualitative information as to their bench operations. Competency in common pharmaceutical calculations, speed and accuracy in weighing, measuring and blending, unfaltering care and cleanliness as well as the use of good technical English in reporting are essential. Free use of the common compendia and pharmaceutical references during the examination is permitted.

Forensic Pharmacy and Pharmacy Practice

Candidates will be required to effectively communicate with the interviewer and demonstrate knowledge of the State and Commonwealth laws relating to the practice of pharmacy in Victoria, to demonstrate competence in reading prescriptions and the management of medication problems.

The candidate will be required to demonstrate competence in the relevant technical and forensic details relating to the area of pharmaceutical practice they have been engaged in during the period of traineeship.

The candidate will be expected to exhibit knowledge of the responsibilities of pharmacists under the:

(a) Pharmacists Act 1974
(b) Pharmacist Regulations 1992
(c) Drugs, Poisons and Controlled Substances Act 1981
(d) Drugs, Poisons and Controlled Substances Regulations 1985
(e) Relevant Health Services Acts and the relevant sections of the Regulations
(f) Animal Preparations Act
(g) National Health Act and Regulations

The candidate will be expected to demonstrate competence and fluency in spoken English.

Study Guide

The Board issues a Candidate’s Study Guide for the examination in April each year.

Competency standards

In order to assess competence to practise, the Pharmacy Board of Victoria uses the National Pharmacy Competency Standards as set out in the Candidate’s Study Guide.

Closing date of entry

All trainees will be advised of the closing date of entry by a personal communication sent to their last known address.

Examination Rules-Final Examination

The following examination rules are issued by the Pharmacy Board of Victoria. These rules should be read in conjunction with the provisions of the Pharmacists Act 1974.

1 Candidates are required to pay the prescribed fee for the Final Examination subjects as set down under the Pharmacists Act 1974 prior to sitting for examination.
2 An entry for examination will normally only be accepted from graduates who have completed, at the closing date for entries for the examination, at least three-fourths of the prescribed training set down under the Pharmacists Regulations 1992.

3 Candidates must pass both subjects at the one attempt at the Final Examination set down in the Pharmacists Regulations 1992 (ie Practical Pharmaceutics and Forensic Pharmacy and Pharmacy Practice) to be judged successful.

4 In the case of the Practical Pharmaceutics Examination:
   (a) candidates will be permitted to enter the examination room 15 minutes prior to the commencement of the examination;
   (b) candidates may read the examination paper prior to commencement of the examination but may not begin the examination until advised to do so by the supervisor;
   (c) candidates may not leave the examination room until the examination has been in progress for half an hour;
   (d) candidates arriving more than half an hour after the examination has commenced will not be admitted;
   (e) candidates must not communicate with one another in the examination room;
   (f) examination booklets must not be taken from the laboratory;
   (g) examination answer booklets taken from the laboratory will not be marked;
   (h) candidates must not leave their position in the laboratory until approval of the supervisor is obtained.

5 In the case of the Forensic Pharmacy Practice Examination candidates who have not been examined must not communicate with candidates who have taken the examination.

6 Candidates must not communicate concerning the examination with examiners or members of the Pharmacy Board of Victoria from the end of the Final Examination until after the publication of results.

7 Where sickness or other circumstances warranting compassion arise, candidates must furnish written information to the Registrar immediately. In the case of sickness, a medical certificate is required and must be forwarded to the Registrar of the Pharmacy Board of Victoria within 48 hours of the time of consultation.

8 The Pharmacy Board of Victoria will publish results of examination, but it may, in the case of a candidate failing to observe these examination rules, omit the results of such a candidate.

9 Failure to comply with any rule or instruction by an examiner will be regarded as a breach of discipline and may be reported to the Registrar of the Pharmacy Board of Victoria.

10 Any communication regarding examinations must be addressed in the initial instance to the Registrar of the Pharmacy Board of Victoria.
INTRODUCTION

The Graduate Faculty was founded in 1970 to develop and direct all graduate studies in the College. Its major responsibilities relate to the conduct of the Master of Pharmacy course, the Doctor of Philosophy courses of the College and Victorian universities, and the Takeru Higuchi Intersearch programme conducted jointly between the College and the University of Kansas, USA.

The Graduate Faculty consists of all those members of academic staff who hold a degree of Doctor of Philosophy, or have equivalent qualifications and experience, and who are of lecturer status and above. The Graduate Faculty has delegated to its Executive Committee the month to month management of graduate programmes.

Dean, Graduate Faculty
Colin Raper

Executive Committee, Graduate Faculty
Colin Raper (Chairman)
Robert Burnet (Secretary)
Colin B Chapman
David J Craik
Peter J Stewart

Executive Committee, Intersearch
Ronald T Borchardt, University of Kansas
Colin B Chapman, Victorian College of Pharmacy
David J Craik, Victorian College of Pharmacy
Gary L Grunewald, University of Kansas
Lester A Mitscher, University of Kansas
Howard E Mossberg (Secretary, USA), University of Kansas
Colin Raper, Victorian College of Pharmacy
Barry L Reed, Victorian College of Pharmacy
Charles O Rutledge, University of Kansas
Valentino Stella, University of Kansas

Nigel Manning CBE was appointed an Emeritus Professor within the Intersearch programme in 1979.

RESEARCH

Research facilities are available within the Graduate Faculty for students to undertake graduate work in experimental and theoretical areas of the pharmaceutical sciences.

Students may apply for entry to graduate study courses by arrangement with the Graduate Faculty. The following fields of research are available for graduate studies.

Pharmaceutics

Formulation design and delivery of peptides and proteins, controlled release preparation, solid dosage forms, drugs for topical use and oligonucleotide prodrugs. Pharmacokinetics and drug assay including investigations of drug metabolism by liver, lymphatic drug absorption, plasma protein binding on drug effects,
maternally-administered drug effects on foetus, assay development of racemic drugs. Cellular uptake and bioassay of antiviral and antitumour drugs.

**Pharmaceutical Chemistry**


**Pharmacology**

Pharmacological investigations on anti-depressants, antipsychotics, opioids, cannabis and other drugs of abuse. The pharmacology of gut secretion and anti-diarrhoeal drugs. Autonomic mechanisms, pre- and post-junctional agonists and antagonists; receptor differentiation. Dopamine and dopaminergic mechanisms. Carcinogens and cellular functions.

**Pharmacy Practice**

Clinical pharmacy practice; patient information leaflets, domiciliary visiting of asthmatics: attaining positive pharmaceutical outcomes. Drug usage in the elderly. Patient attitudes to their medication. Pharmacist intervention in the prescribing cycle.

**GRADUATE DIPLOMA IN HOSPITAL PHARMACY**

The Victorian College of Pharmacy commenced teaching the Graduate Diploma in Hospital Pharmacy in 1978. Any pharmacist with hospital experience and employed in a hospital or hospital-related practice is eligible to apply for admission to the course. Applications close on 30 November of the year preceding that in which enrolment is desired. The course is conducted on a part-time basis over two academic years. It is the student's responsibility to arrange the necessary day release from the hospital pharmacy department (a total of 27 days each year are required).

The Graduate Diploma in Hospital Pharmacy course is designed to:

(i) train hospital pharmacists in up-to-date skills and knowledge;
(ii) give the hospital pharmacist confidence in communicating with others,
(iii) develop research skills.

The course is centred around disease states and encompasses the three areas of clinical pharmacology, clinical pharmaceutics and applied hospital pharmacy practice. Most of the major disease systems of the body are covered during the course. Wherever possible the seminars on clinical pharmacology are designed to interface with clinical pharmaceutics to show the relevance of such pharmaceutical aspects as doseform design, dosage regimen and selection. Material on patient counselling and advice for patients is introduced for each disease.

Seminars on communication techniques and counselling are taught under the general heading of hospital pharmacy practice. This relatively small section of the course also introduces the student to pertinent subjects such as the role and structure of the health and hospital services, drug distribution, IV additives, drug monitoring and hospital reaccreditation procedures.
Generally, seminars will be held in the mornings at the Pharmacy College. Didactic contact over the two academic years is about 165 hours, approximately broken down as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Pharmacology</td>
<td>108</td>
</tr>
<tr>
<td>Clinical Pharmaceutics</td>
<td>37</td>
</tr>
<tr>
<td>Applied Hospital Pharmacy Practice</td>
<td>20</td>
</tr>
</tbody>
</table>

In addition, formal course work on data processing, application of computers, information retrieval and relevant biostatistics will be presented. This will account for another 13 hours of formal lecture time.

Afternoons are generally reserved for tutorials, discussion groups, clinical sit-ins, student-presented case histories, ward rounds, hospital/work visits, visits to biochemistry, haematology and pathology laboratories, laboratory exercises and demonstrations. These will account for another 200 hours formal contact time over the two years.

Great importance is placed on the active participation of each of the students in seminar presentations and discussion groups. The student’s performances at these seminars and tutorials will be closely monitored; marks will then be allocated on degree of participation in discussion, on rapport established with colleagues, on information contributed and on communicative ability.

In addition to the timetabled activities, it is expected that the student will spend another 8–12 hours per week on personal private study. This will involve library and literature assignments, preparation of patients’ case histories from the base hospital, and relearning basic material for on-coming lectures.

Projects organised in conjunction with the course director and hospital chief pharmacists will be undertaken at the students’ hospitals. Such projects, where possible, will be selected to meet the student’s individual interests and will take advantage of the particular skills and expertise of the hospital and chief pharmacist concerned. A project supervisor will be appointed to assist the student.

Students will be called upon to deliver formally the results of their projects at appropriate intervals. Marks will be accredited for such presentations.

**Clinical Pharmacology**

A course of 108 hours.

*Pathophysiology of disease and therapeutics.* This section embraces diseases of the following organs and systems: cardiovascular system, blood, respiratory system, gastrointestinal tract, liver, gall bladder and pancreas, kidneys and urinary tract, endocrine glands, connective tissue, bone, reproductive tract, skin, ear, nose, throat, eye. In addition, diseases due to pathogenic organisms, inborn errors of metabolism, disorders of water, electrolyte and acid-base balance, psychiatry and neurology, tissue and organ growth, wounds, neoplastic and immunologically-based diseases, poisoning and pain control are also covered.

*Advanced pharmacology.* This will consist of revision and an update of knowledge acquired during practice and from the BPharm course. Advanced studies will include mechanisms of drug action, interactions, selective toxicity, pharmacology in relation to age and in relation to genetic-based disorders.
General health science in relation to drugs and therapy. Environmental hazards in relation to toxicity, epidemiological approach to disease, ageing, preventive medicine and drug dependence are included in this section.

During the course, aspects under the headings above which have a common theme will be considered concurrently (centred around a particular disease state) in order to maintain an integrated approach.

Textbooks
Advice on selection of some of the following books will be given in the introductory lectures.


Clinical Pharmaceutics
A course of 37 hours.

Relevant topics in the syllabus of the BPharm course will be extended and practical applications will be emphasised. This section will comprise three main areas.

Applied biopharmaceutics. Drug absorption, distribution, factors in drug action, drug response in pathological states, protein and tissue binding, biopharmaceutics of drug interactions, bioavailability, correlation of in vitro tests with clinical response, generic and therapeutic equivalence, pharmacokinetic modelling, multidosage pharmacokinetics and prediction of blood levels from dosage regimens, clinical pharmacokinetics in renal, hepatic, cardiac failure and malabsorption states, blood levels and pharmacodynamic effects, non-linear systems, sustained-release formulations and novel, programmed-release dosage forms.

Applied microbiology. Preparation and testing of injections, large volume intravenous solutions and ophthalmics, intravenous additives, renal and peritoneal dialysis, laminar flow technology, microbial contamination and microbial limit tests.

Applied pharmaceutics. Pertinent aspects of formulation, stability, quality control, GMP, physical and chemical incompatibility associated with intravenous additives.

Textbook
Applied Hospital Pharmacy

A course of 20 hours.

Applied statistics. Biostatistics pertinent to clinical orientation, eg, design of clinical trials, statistics of regression and correlation, analysis of variance, sampling, probability and quality control, questionnaire design and analysis of such data.

Computers and hospital practice. Applicability of the computerization of pharmacy services in the following areas: maintaining patient profiles, medication records, transcription and medication errors, budget and stock control, economic utilisation of drug resources, drug information services, data file and data base handling techniques, introduction to relevant languages.

(Note: It is the aim of this section to orientate the participant more towards system analysis and implementation, rather than to actual detailed programming.)

Pharmacy practice. Subjects such as consultative interview techniques and patients' drug histories, patient orientated medication records, patient compliance, drug distribution systems, unit packs and relevant packaging technology, ward stock control, drug information services, intravenous additives, parenteral alimentation, and radiopharmaceuticals may be offered, possibly as electives.

Textbooks


MASTER OF PHARMACY DEGREE

The degree of Master of Pharmacy (M Pharm) is awarded to students who successfully complete two years of full-time study after having been admitted to the Bachelor of Pharmacy degree or a Bachelor of Science degree. Information relating to the award of this degree may be obtained from the Dean of the Graduate Faculty.

To be eligible to enter the M Pharm programme students normally are expected to have obtained excellent grades at the B Pharm examination, or hold an equivalent qualification recognised by the College.

Students are not precluded from nominating the area in which they wish to pursue their studies. However this is often conditional upon the availability of materials, equipment, and supervisors. Often a student is well advised to place the final choice of area in the hands of the Graduate School.

Students proposing this course are requested to apply in writing to the Dean of the Graduate Faculty in the year prior to their proposed commencement of studies. Programmes for the M Pharm degree normally commence in March of each year.
Each full-time student is eligible to apply for an Australian Post-Graduate Research Award or a research scholarship offered through the College. The former Awards are restricted to Australian citizens, or candidates with permanent resident status. The awards provide a scholarship of approximately $13,000 gross per annum.

DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy (PhD) is awarded to students who successfully complete three years of full-time study after having completed an honors degree or its equivalent. Suitable masters degree students may transfer to PhD studies, having completed or partially completed a masters degree. Information relating to the award of this degree may be obtained from the Dean of the Graduate Faculty.

To be eligible to enter the PhD programme students normally are expected to have obtained excellent grades in their previous studies and their qualification must be recognised by the College.

Students are not precluded from nominating the area in which they wish to pursue their studies. However this is often conditional upon the availability of materials, equipment and supervisors. Often a student is well advised to place the final choice of area in the hands of the Graduate School.

Students proposing this course are requested to apply in writing to the Dean of the Graduate Faculty in the year prior to their proposed commencement of studies. Programmes for the PhD degree normally commence in March of each year.

Each full-time student is eligible to apply for an Australian Post-Graduate Research Award or a research scholarship offered through the College. The former Awards are restricted to Australian citizens, or candidates with permanent resident status. The awards provide a scholarship of approximately $13,000 gross per annum.

Takeru Higuchi Intersearch Programme. Intersearch is a graduate research programme conducted at the international level by the United States of America and Australia through the University of Kansas (USA), and the Victorian College of Pharmacy (Monash University). It is for graduate students of excellent quality. Intersearch is designed to train doctors of philosophy by teaching the methods of research and at the same time offering a broadening international experience.

A joint degree will be awarded under the names of both institutions. Graduates from this programme will be trained in a manner suitable to the needs of the pharmaceutical industry and institutions of higher learning in both countries.

This joint programme will admit students from either institution to either campus. A further requirement is that each student entering the programme must engage in studies for at least twelve months on each campus. Return economy class fares are provided for students admitted to the programme. Students will obtain financial support during their studies.

Further information, including details of financial support, may be obtained from the Dean and Director of the Victorian College of Pharmacy who acts as Australian Secretary for the Executive Committee of Intersearch.
### Fees

Students enrolling for the Master of Pharmacy and Doctor of Philosophy courses on a full-time basis will be required to meet the following charges:

- **Annual subscription to Victorian Pharmacy Students Association** (granting access to Monash sporting facilities) $50.00
- **Service Fee** $60.00
- **Equipment/Library deposit*** $100.00
- **Total** $210.00

*Refundable, upon completion or termination of course*

Students enrolling for the above courses on a part-time basis will be required to meet the following charges:

- **Annual subscription to Victorian Pharmacy Students Association** (granting access to Monash sporting facilities) $25.00
- **Service Fee** $35.00
- **Equipment/Library deposit*** $100.00
- **Total** $160.00

*Refundable, upon completion or termination of course*

Students enrolling for the Graduate Diploma course will be required to meet the following charges:

- **Annual subscription to Victorian Pharmacy Students Association** (granting access to Monash sporting facilities) $29.00
- **Service Fee** $36.00
- **Total** $65.00
Students Association, Counselling, Library

Victorian Pharmacy Students Association

Student activities at the College centre around a Student Representative Council. The SRC performs a leading part in student government and is the point of contact between the corporate body of students and the College administration.

It is responsible for the organisation and development of student activities on the campus which cover sporting, cultural and social activities.

Several student organisations are affiliated with the Student Council. Students may obtain further information about these organisations at the SRC office.

Students are encouraged to make full use of these facilities.

A Student Council is essential to a tertiary institution which is seeking the development of its students so that they can, in the future, take leading parts in community affairs as well as in their respective professions.

Student Counselling

A counselling service is available to all students who may require advice or to discuss any problems that may arise during the pharmacy course.

Appointments for interviews may be arranged by personal approach to either of the two counsellors:

Robert Burnet (Deputy Director)
Louis Roller (Sigma Department of Pharmacy Practice)

C L Butchers Memorial Library

The C L Butchers Memorial Library comprises about 12,000 volumes, including several historic runs of pharmacy journals, and a number of valuable old books. The Library has been planned as a special collection for the pharmaceutical sciences and drug technology, and not as a general library. Of its type it is the most important collection in Australia. It has been maintained since 1857 and was originally designed primarily for the use of members of the Pharmaceutical Society of Australia (Victorian Branch) Ltd.

Council has directed that the administration of the Library be attached to the Dean and Director's Office. A student representative sits on the Library Committee.

The Library is available for study and reference purposes, from 8.30 am to 5.15 pm from Monday to Friday during semester.
Library Rules
1 The Library is available for study and reference purposes.
2 Silence is requested in the Library at all times.
3 Bags, food and drinks are not permitted in the Library.
4 Some overnight loans are permitted, but these must be returned by 9.00 am on the following morning.
5 Periodicals may not be borrowed by students.
6 ‘Library Use’ slips are to be made out for counter reserve material, which must be returned to the counter after use.
7 Borrowers are responsible for the ‘making good’ or replacement of library material damaged or lost while in their charge.
8 Smoking is not permitted in the Library.
9 Users failing to observe the current rules may be suspended from using the Library.
In addition to the sponsors of subject exhibitions and special awards, which are duly acknowledged in this Handbook, the Council of the College would like to record its gratitude in respect of the following major areas of support:

**Takeru Higuchi Intersearch Programme**
This is a PhD programme conducted jointly by the College and the University of Kansas, USA, and is supported by corporate and private donations.

**Sigma Department of Pharmacy Practice**
The Sigma Department of Pharmacy Practice was established in 1982 through the generous support of Sigma Co. Ltd. Funds have been made available to supplement academic and administrative salaries within the Department which is responsible for the presentation of the Graduate Diploma in Hospital Pharmacy course and the pharmacy practice content of the Bachelor of Pharmacy course. The Department operates within the school of Pharmaceutics and Pharmacy Practice.

**Sigma College Centenary Scholarship**
*Recipient:*
1992 Maggie Bassily

**David Newnham Memorial Leukaemia Research Fellowship**
Friends and relatives of the late Mr David Newnham have established a memorial fund to foster research which impinges on possible contributions to an understanding of the disease leukaemia.
*Recipient:*
1992 Barrie C Finnin

**Victorian College of Pharmacy Scholarship**
The College conducts an ongoing Drug Research Appeal which has been generously supported by many private and organizational donors, both within and outside the profession. The following fellowships are being provided from the Drug Research Appeal Fund and other sources and commemorate the centenary of the Victorian College of Pharmacy.
*Recipients:*
1992 David Bibby
Arthur Christopoulos
Bernadette Hawkins
James Horne
David Kong
Kaye Mason
Spiro Pavlopoulos
Abdallah Salem
Lee Ann Whitfort

**Cyril Tonkin Scholarship**
The Pharmaceutical Society of Australia (Victorian Branch) has awarded Cyril Tonkin Scholarships to graduate research students.
Recipients:
1992 Loan Bui
Pascal Hickey
Sally Thompson

Pharmasearch Ltd — John A Hersey Memorial Scholarship
Pharmasearch Ltd is currently funding a scholarship in memory of the foundation Chairman of the Institute of Drug Technology Ltd, Professor John A Hersey.

Recipient:
1992 Murray Coles

Australian Post-Graduate Research Awards

Recipients:
1992 Peter Borg
Jackie Jarvis
Louise McCrossin
Stephanie Ng

Australian International Development Assistance Bureau

Recipient:
1992 Emson Nyoni

University of Melbourne Post-Graduate Scholarship

Recipients:
1992 David Chalmers
Jiu Li Huang

Victorian Health Promotion Grant

Recipient:
1992 Kei Sorimachi

Australian Post-Graduate Research Award (Industry)

Recipient:
1992 Louise Bennett

Glaxo Australia Scholarship

Recipient:
1992 Aaron Guttmann

Victorian Education Foundation

Recipients:
1992 Lidia Najbar
Beata Smalec
Victoria Sowemimo

87
### Exhibitions and Awards

**FIRST YEAR EXHIBITIONS**
- Pharmaceutics I
- Pharmaceutical Chemistry I
- Pharmaceutical Pharmacology I
- Mathematics and Computer Science
- Pharmacy Practice I

Sigma Company Limited: $500
Glaxo Australia Pty Ltd: $500
Salaried Pharmacists' Association: $500
A J Cobcroft Trust Fund: $200
Sigma Company Limited: $500

**SECOND YEAR EXHIBITIONS**
- Pharmaceutics II
- Pharmaceutical Chemistry II
- Pharmaceutical Pharmacology II — Francis Hardey Faulding Exhibition
- Pharmaceutical Microbiology Exhibition

Sigma Company Limited: $500
Kodak (Australasia) Pty Ltd: $200
F H Faulding & Co Limited: $200
To be advised

**THIRD YEAR EXHIBITIONS**
- Pharmaceutics III — Scott McGibbony Prize
- Pharmaceutical Chemistry III
- Pharmaceutical Pharmacology III
- Pharmacy Practice
  - Forensic
  - Management/Administration

The Pharmacy Guild of Australia: $500
Kodak (Australasia) Pty Ltd: $200
Sigma Company Limited: $500
Society of Hospital Pharmacists of Australia (Victorian Branch): $500
The Guild Insurance Co Ltd: $500
Norman Martin Trust Fund: $200

**GRADUATE DIPLOMA IN HOSPITAL PHARMACY**
- Centenary Award

Wellcome Australia Ltd: $250

**MASTER OF PHARMACY**
- Computer Science
- Statistics

A J Cobcroft Trust Fund: $200
A J Cobcroft Trust Fund: $200

**SPECIAL AWARDS**
- Chapter Prize
- Pharmacy Exhibition
- Pharmacy Gold Medal

Chapter of Pharmacy Practice Tutors: $200
Pharmaceutical Defence Ltd: $1000
Pharmaceutical Society of Australia (Victorian Branch) Ltd

88
College Rules
(issued by the Council)

Classes
1 Students are required to familiarise themselves with the timetables and to observe the hours of attendance at lectures, tutorials, practical work, and all examinations.
2 Every student is required to attend at least three-fourths of the lectures and three-fourths of the practical work, in each subject, in order to complete satisfactorily any year of the course.
3 During classes students must confine themselves to their allotted places. Talking and noise during the delivery of lectures are prohibited.
4 Only such experiments and operations as are sanctioned by the lecturer are to be undertaken.
5 Smoking is not permitted in any building.
6 No chemical, drugs, or biological materials may be taken into or out of the laboratory without the permission of the lecturer-in-charge.

Finance
7 All apparatus lent or hired to students must be returned clean and in good order, or paid for.
8 Credit for term attendances at lectures cannot be given until all fees due have been paid.
9 No student shall be allowed to enter on a new semester at the College while fees for the previous semester are unpaid, unless a satisfactory reason is given to the Deputy Director.
10 Any damage done to the furniture, fittings, books, specimens or apparatus in the College by any student shall be a charge against such student, who shall be held liable for the cost of any repairs or replacements necessary.
11 Students must enter for examinations before the closing date of entry. A fee is chargeable for late entries.

Conduct
12 Before leaving the laboratories students must clean and arrange their benches for the benefit of subsequent classes. Apparatus must be put away in its proper place.
13 Suitable footwear must be worn by students on the College premises.
14 When using the Library the rules in force at the time must be strictly observed.
15 Food refuse must be either returned to the dining room or placed in a rubbish-bin.
16 All used food utensils and food containers must be returned to the dining room immediately after use.
17 One of the functions of the Dean and Director and the other administrative officers is to protect life and property. Students interfering with such things as lighting, fire hoses, safety apparatus, or door locks can create a hazard to life. Fireworks are banned on College premises.
18 As the College campus, like its budget for cleaning and repairs, is small, any forms of campus ‘rags’ or games are not permitted.
19 The College is allowing an increasing amount of expensive research and other equipment to be used by students for teaching purposes. Any careless damage to such equipment will be regarded as a serious breach of College rules.
Where students have been guilty of any misconduct or breach of these rules, they may be reprimanded by the Deans Board, or reported by it to the Council, to be dealt with as the Council shall think fit.

**WARNING** Students are requested to exercise the utmost care with drugs and chemicals, many of which are either inflammable or poisonous.

A particularly strong warning is given to students concerning the handling of live microorganisms, and exposure to radiations of any kind. Take no liberties. Where the slightest doubt exists, refer to a member of staff.

An outline of the safety procedures adopted by the College is given in the booklet "Safety precautions and emergency procedures" which is issued to students at the start of the course.
Examinations

The Pharmacists Act 1974 provides that the Pharmacy Board of Victoria shall have the power to control and direct examinations concerned with the pharmacy course. The Board's examinations are conducted in the College.

The College teaching staff act as examiners for the Pharmacy Board in the Pharmacy I, II and III Examinations.

The Pharmacy I, Pharmacy II and Pharmacy III Examinations are conducted respectively at the end of successive years of the course.

Form of Examinations

The Examinations shall consist of theoretical, practical, or oral examinations as may be required by the examiners concerned.

The Pharmacy I Examination shall consist of examinations in the following:

- Pharmaceutics I
- Pharmaceutical Chemistry I
- Mathematics
- Pharmaceutical Pharmacology I
- Pharmacy Practice I (including Human Behaviour)

The Pharmacy II Examination shall consist of examinations in the following:

- Pharmaceutics II
- Pharmaceutical Chemistry II
- Pharmaceutical Pharmacology II (including Biochemistry)
- Pharmaceutical Microbiology
- Pharmacy Practice II

The Pharmacy III Examination shall consist of examinations in the following:

- Pharmaceutics III
- Pharmaceutical Chemistry III
- Pharmaceutical Pharmacology III
- Pharmacy Practice III

Syllabus

Pharmacy I, II and III Examinations

The Syllabus for the Pharmacy I, II and III Examinations will be the syllabus set for the three years of the course respectively.
Examination Rules
(Issued by the Victorian College of Pharmacy)

The following examination rules are issued by the Victorian College of Pharmacy and the Pharmacy Board of Victoria. These rules should be read in conjunction with Council's policy concerning courses of study published on page 20.

1 An entry for an examination will only be accepted from students who have attended at least three-fourths of the lectures and at least three-fourths of the practical work of each subject for which the student is required to enter.

2 Candidates will be permitted to enter the examination room fifteen minutes prior to the commencement of the examination.

3 Candidates may read the examination paper during 15 minutes prior to the commencement of the examination but may not make use of calculators or begin writing until advised to do so by the supervisor.

4 Candidates may not leave the examination until it has been in progress for half an hour.

5 Candidates arriving more than half an hour after the examination has commenced will not be admitted.

6 In the case of written examinations, candidates will not be allowed to bring in any text books, lecture notes or other written material except where specific instructions have been given by the examiner in charge of the subject. In any case the use of text books borrowed from the library of the Victorian College of Pharmacy will not be permitted.

7 Tables of logarithms will be available if required and candidates may bring a slide rule with them if they so desire. Unprogrammed electronic calculators may be used in examinations. However, no claim for special consideration on the grounds of calculator breakdowns will be accepted and candidates should therefore be able to use logarithm tables efficiently.

8 Candidates must not communicate with one another whilst in the examination room.

9 No examination books, tables of logarithms or other material which is the property of the Victorian College of Pharmacy or the Pharmacy Board of Victoria are to be removed from the examination room.

10 At the end of an examination all candidates must remain seated until all examination books have been collected.

11 Candidates must not communicate with examiners prior to the publication of results.

12 Where sickness or other circumstances warranting compassion arise, candidates for examinations must furnish written information to the Registrar immediately. In the case of sickness a medical certificate is required and must be forwarded to the Registrar of the College within forty-eight hours of the time of consultation.

13 Supplementary examinations will be held when necessary at the discretion of the Board of Examiners. Individual examiners may prescribe additional examinations, either written, oral, or practical when and as required. Candidates are therefore advised to be available after the completion of the annual examinations and pending publication of the examination results.
The Council of the College and the Pharmacy Board of Victoria will publish results of examinations, but the Council of the College may, in the case of a candidate's failing to observe these examination rules, omit the results of the said candidate and/or exclude the said candidate from further courses of study at the College.

Failure to comply with any rule or instruction by the supervisor will be regarded as a breach of discipline and may be reported to the Registrar of the College.

Any communication regarding examinations must be addressed in the initial instance to the Registrar of the Victorian College of Pharmacy.

In these rules 'examinations' includes supplementary examinations and any additional examinations, either written, oral or practical, prescribed by an individual examiner.
Monash University faculty handbooks:
- Arts Handbook
- Business Handbook
- Computing & Information Technology Handbook
- Economics Commerce & Management Handbook
- Education Handbook
- Engineering Handbook
- Law Handbook
- Medicine Handbook
- Professional Studies Handbook
- Science Handbook

Other Monash handbooks
- Monash University – Gippsland Handbook
- Victorian College of Pharmacy Handbook
- Student Information Handbook

Recommended retail price: $5