



**VICTORIAN  
COLLEGE OF PHARMACY LTD.**

*School of The Pharmaceutical Society of Victoria*

**1881-1981**  
A Century of Achievement

---

**Handbook 1981**



*The Victorian College of Pharmacy Ltd, Parkville, from a painting by Nornie Gude*

VICTORIAN  
COLLEGE OF PHARMACY LTD  
1881-1981

---

Handbook 1981

---

VICTORIAN COLLEGE OF PHARMACY LTD  
Established 1881  
*School of The Pharmaceutical Society of Victoria*

381 Royal Parade, Parkville, Victoria 3052  
Telephone 387 7222

Recognised by the Pharmacy Board of Victoria in accordance with  
the provisions of the Pharmacists Act 1974

## CONTENTS

Principal dates 1981	3
Council of Victorian College of Pharmacy Ltd	4
Past Presidents	5
Academic staff of the College	6
Centenary Year	8
Centenary Celebrations	9
Pharmacy courses	10
Entrance, curriculum, practical training	10
B Pharm, M Pharm, PhD, Grad Dip Hosp Pharm	13
Council's policy concerning courses of study	14
Fees, allowances, RACI membership	16
Details of subjects	17
First year	17
Second year	28
Third year	39
Graduate School	46
Research	46
Graduate Diploma in Hospital Pharmacy	47
Sponsorships	51
Exhibitions	53
Special awards	54
College rules	55
Students' Representative Council	56
Student counselling	56
Library	57
Pharmacy Board of Victoria	58
Examinations	59
Pharmacy I, II, III	59
Final	60
Rules	61
Victorian College of Pharmacy Ltd.	
Victorian Institute of Colleges	
Bachelor degrees regulations	63
Master degrees regulations	65
Pharmaceutical Society of Victoria	
D Pharm Regulations	73

## PRINCIPAL DATES 1981

January	5	College re-opens after Christmas
	26	Australia Day – College closed
February	26	First term begins (first year students only)
March	2	First term begins (second and third year students)
	9	Labour Day – College open, lectures continue
	18	Centenary Address and prize-giving
April	9	Last day for entry for Pharmacy III May Examination
	9	Last day for entry for May Final Examination
	17	Easter Friday: no lectures
	22	Lectures resume after Easter recess
May	5	Conferring of degrees
	8	First term ends
	14	Progress Examinations begin
	18	Pharmacy III Examination begins
	18	Final Examination begins
	20-24	Centenary celebrations
June	1	Second term begins
	8	Queens Birthday – College open, lectures continue
July	24	Last day for entry for Pharmacy I Examination
	27	Last day for entry for Pharmacy II Examination
	29	Last day for entry for Pharmacy III Examination
August	7	Second term ends
	31	Third term begins
September	24	Show Day – College open, lectures continue
October	2	Last day for entry for Final Examination
	16	Third term ends
	19	Final Examination begins
	26	Pharmacy I, II and III Examinations begin
	31	Applications for admission to Bachelor of Pharmacy course in 1982 close with VUAC
November	3	Cup Day – College open, lectures continue
	25	Last day for return of locker keys and removal of apparatus
December	24	Closing date for applications for admission to Graduate Diploma in Hospital Pharmacy course

# Victorian College of Pharmacy Ltd 1881-1981

## THE COUNCIL 1980-81

N W Naismith, PhC, MPS, FSHP *President*

T J Lynden-Bell, PhC, MPS, *Vice-President*

D W F Bourne, PhC, MPS *Honorary Treasurer*

G J Duffus, PhC, MPS

H V Feehan, BCom(Hons), AFAIM, AFIBA, MRSH

F V Gilbert, PhC, MPS

Lyn J Hamill, BPharm, MSHP

N H Hookey, PhC, MPS

L Roller, BPharm, MSc, DipEd. PhC, FPS, AMPsS

B D Taylor, BSc

G N Vaughan, MSc, PhD, FRACI, FPS

R W Webster, MBBS, FRACP, FRACGP

R Burnet, BA, MBA, MAITEA, *Registrar*

## PAST PRESIDENTS

1857-58 Frederick Cooper	1919-21 Henry Budge Taylor
1858-59 Joseph Bosisto	1921-22 Charles G Imes
1859-60 George Lewis	1922-23 Walter Charles Kernot
1860-61 William Ford	1923-24 Frederick Lee
1861-63 George Wragge	1924-25 Arthur Rudolph Bailey
1864-73 William Johnson	1925-28 Arthur Leslie Jones
1874-76 Joseph Bosisto	1928-30 Alexander McCamey Hadden
1877-78 William Johnson	1930-32 Ebenezer Connal McClelland
1878-80 Cuthbert Robert Blackett	1932-33 Alexander Washington McGibbony
1881-83 William Bowen	1933-34 Albert Gorman
1884-85 Thomas Huntsman	1934-35 Ebenezer Connal McClelland
1885-86 William Bowen	1935-38 Charles Penrose Acteson Taylor
1887-89 Thomas Huntsman	1938-41 William Francis Begg Gough
1890-91 Henry Thomas Tompsitt	1941-45 Samuel James Baird
1891-95 Joseph George	1945-48 Vivian George Morieson
1896-97 Thomas Mordey Blackett	1948-51 Leonard Long
1897-1900 William Witt	1951-53 Albert George Davis
1901-02 Edwin Thomas Church	1953-55 Ivan James Thompson
1903-05 Arthur Rudolph Bailey	1955-60 Eric Scott
1906-08 John Champion	1960-63 Frederick William Johnson
1909-10 Duncan Rankin	1963-65 John Rudelhoff Oxley
1911-12 John Charles Pickford	1965-67 Alan Louis Hull
1912-13 Edwin Thomas Church	1967-70 Alistair Ian Kingswell Lloyd
1913-15 Arthur Rudolph Bailey	1970-72 Raymond Basil Grinlington
1915-19 David Alexander Cossar	1972-75 Geoffrey Malcolm Oscar
	1975-78 Graham James Duffus

# Victorian College of Pharmacy Ltd

## ACADEMIC STAFF

*Dean of the College, Kansas Professor of Pharmacy*

G N Vaughan, MSc, PhD, FRACI, FPS

*Deputy Dean of the College*

I H Pitman, BSc, PhD, PhC, MPS, FRACI

## School of Pharmaceutical Chemistry

*Dean (Chemistry) and Head of the School,*

*Kansas Professor of Medicinal Chemistry*

P R Andrews, BSc(Hons), PhD

### Lectorial Staff

G L Blackman, BSc(Hons), PhD, ARACI

H Dowd, MSc, PhC, ARACI

J V Hurley, MSc, DipEd, ARACI

S J Jennings, BSc(Hons), ARACI

M Needleman, BSc(Hons), PhD

### Demonstrator Staff

P Harman, BSc(Hons), PhD, ARACI

D Iakovidis, MSc, ARACI

Gillian K McInnes, BSc(Hons)

J K Nichols, BSc(Hons)

D A Winkler, BSc(Hons), BAppSc, PhD

Mitchell.

## School of Pharmaceutics

*Dean (Pharmaceutics) and Head of the School,*

*Kansas Professor of Pharmaceutics*

I H Pitman, BSc, PhD, PhC, MPS, FRACI

*Sigma Industrial Professor, Associate Dean of the School*

J A Hersey, BPharm, PhD, DSc, CEng, FPS, FICHEM, FRACI, FBIM

*M A Nicholas Industrial Professor*

B L Reed, BPharm, PhD, PhC, FPS, MIBiol, MIPharmM, MSHP

### Lectorial Staff

P C Bury, MSc, PhD

B C Finnin, BPharm, PhD, PhC, FPS

I P Griffith, MA, PhD, MASM

B H Kellett, MSc, DIC, PhD

D J Morgan, MSc, PhD, PhC, MPS

R C Oppenheim, BSc, PhD, DipEd, ARACI

L Roller, BPharm, MSc, DipEd, PhC, FPS, AMPsS

W J Thiel, BSc(Hons), PhD

### Demonstrator Staff

May R Admans, MPharm, PhC, MPS

J R Anderson, MPharm, PhC, MPS

Olga Dudinski, MPharm, PhC, MPS

C L Farquhar, BPharm, PhC, MPS

Elizabeth M Gipps, BPharm, DipHP, PhC, MPS

C J London, BSc(Hons)

Dawn W Sayers, PhC, FPS



## **School of Pharmacology**

*Dean (Pharmacology) and Head of the School,  
Kansas Professor of Pharmacology and Toxicology*

C. Raper, BPharm(Hons), PhD, PhC, MPS

### *Lectorial Staff*

I M Coupar, BPharm(Hons), PhD

N P Madsen, MSc, PhD

E Malta, BSc(Hons), PhD

F J Mitchelson, MSc, PhD, PhC, MPS

A B Traill, BSc

### *Demonstrator Staff*

Choo Lay Khoon, BSc(Hons)

M J Quinn, BSc(Hons)

P Tawa, BSc(Hons)

D A Taylor, BSc(Hons), PhD

*P. McLennan.*

### *Graduate Diploma in Hospital Pharmacy*

K Raymond, MPharm, PhD, MPS

## **Special Subject Lecturers**

D P Crankshaw, MBBS, PhD, FFARACS (Pharmacology)

K S Fizelle, LLB (Forensic)

A B Glover, BSc, MBBS, PhD (Clinical Pharmacology)

L G Howes, MBBS (Clinical Pharmacology)

A I K Lloyd, ED, PhC, FPS (Pharmacology)

P J Lumley, BPharm, PhC, FPS (Forensic)

N Martin, ACA (Management)

D B Newgreen, BPharm, PhC, MPS (Forensic)

D A Wishart, LLB BCom (Commercial Law)

## **LIBRARY STAFF**

### *Librarian*

Helen M Murphy, BA

### *Associate Librarian*

M E Williams, BA, ALAA

Helen E Comben, BA, ALAA

## **ADMINISTRATIVE STAFF**

### *Executive Director*

H V Feehan, BCom(Hons), AFAIM, AFIBA, MRSH

### *Registrar*

R Burnet, BA, MBA, MAITEA

### *Business Manager*

J E Colt, BCom, AASA

### *Property Manager*

R McLaren

# Victorian College of Pharmacy Ltd

1881-1981

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 award 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 been 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 1972 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 has been 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 to 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 responsible to the Victorian Post-Secondary Education Commission and is required to operate in accordance with the Post-Secondary Education Act 1980.

### **CENTENARY CELEBRATIONS, 1981**

The College will celebrate its Centenary in 1981 and has arranged several functions to recognise a century of achievement.

**Wednesday 18 March** The Premier has been invited to deliver the Centenary Address and present the prizes and awards at the Centenary Opening and Prize Ceremony. This annual ceremony will have special significance in our Centenary year.

**Tuesday 5 May** Centenary Graduation, Cossar Hall 8.00 pm. The Governor has been invited to be the Distinguished Visitor at the Centenary Graduation Ceremony and to deliver the Centenary Address. Graduates will receive degrees of Bachelor of Pharmacy, Master of Pharmacy and Graduate Diplomas in Hospital Pharmacy.

**Friday 8 May** Centenary Ball, Melbourne Town Hall. The traditional first term ball held by the Victorian Pharmacy Students' Association will be turned into a spectacular Centenary event.

**Wednesday 20 May-Friday 22 May** Centenary Seminar Series. Seminars and displays will be held at the College in areas of pharmacy practice, pharmacy education and pharmacy research. Overseas visitors will present key-note papers and distinguished Australian pharmacists will participate.

Concurrently with the Centenary Seminar other groups will hold meetings at the College. An international Conference on Structure Activity Relationships in Drugs has been organised by the Royal Australian Chemical Institute, the Pharmaceutical Society of Australia will hold its Annual General Meeting, a seminar on Drug Abuse in Sport and other meetings have been organised to date including an Institute of Drug Technology seminar series.

**Saturday 23 May** Centenary Banquet, Great Hall, National Gallery of the Victoria 7.00-11.00 pm. This formal function will be the highlight of the Centenary Celebrations at which Professor Frank Fish, Dean of the London School of Pharmacy, will deliver the Centenary Oration.

**Sunday 24 May** College Open Day. The College will present many displays to illustrate modern approaches to research in the pharmaceutical sciences. There will be presentations by the various interest groups in pharmacy — hospital pharmacists, the pharmaceutical industry, pharmacy history, poisons information, pharmacy education and many others.

#### **Special Events**

A piece of sculpture will be commissioned to commemorate the Centenary in perpetuity.

A booklet will be published by Mr H V Feehan which will detail the early history of the College.

Australia Post will issue a pre-stamped commemorative envelope.

The College will publish a Calendar which will graphically outline current research being performed at the College.

History displays will be shown at the Latrobe Library and at the College. A Centenary Medallion will be minted.

# Pharmacy Courses

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.

## Entrance requirements

- 1 Candidates undertaking Victorian Institute of Secondary Education (VISE) Year 12 courses of study:
  - (a) full-time candidates under 21 years of age must obtain Grade D or above in the following four Group 1 subjects at the one attempt; English, Chemistry, Physics and a branch of Mathematics
  - (b) candidates under 21 years of age who are in full-time employment and candidates over 21 years of age when they commence such studies must obtain Grade D or above in the following four Group 1 subjects, but not necessarily at the one attempt; English, Chemistry, Physics and a branch of Mathematics.
- 2 Applications for admission received from persons who have undertaken studies other than VISE Year 12 studies will be considered on their individual merit.

## Application for admission

Application forms for admission to the Bachelor of Pharmacy course may be obtained from the Victorian Universities Admissions Committee at 11 Queens Road, Melbourne, 3004. Applications close on October 31 of the year preceding that in which enrolment is desired.

## Overseas students

Overseas applicants who seek admission to the college must have passed the equivalent of three GCE Advanced Level subjects including chemistry, and two from the following three: physics, mathematics, biology. In addition, the subject English must have been passed at Ordinary Level. Students without a strong background in mathematics are not eligible. Overseas students are also advised that they are required to pay tuition fees amounting to \$1500 per annum.

## Selection

If the number of applicants exceeds the number of vacancies within the college, admissions will be determined by a selection committee.

## **Exemptions**

Students from other institutions may be admitted with advanced standing, which will be determined by Council in each individual case.

## **Curriculum**

The academic course occupies three years of full-time study.

Subjects are:

### *First Year*

- Pharmaceutics I
- Pharmaceutical Chemistry I
- Physiology
- Mathematics

### *Second Year*

- Pharmaceutics II (including Microbiology)
- Pharmaceutical Chemistry II
- Pharmacology I (including Biochemistry)

### *Third Year*

- Pharmaceutics III
- Pharmaceutical Chemistry III
- Pharmacology II
- Pharmaceutical Administration and Organisation
- Forensic Pharmacy

## **Honours**

There will be four grades of honours awarded in the subjects: Pharmaceutics I, Pharmaceutical Chemistry I, Mathematics, Physiology, Pharmaceutics II (including Microbiology), Pharmaceutical Chemistry II, Pharmacology I (including Biochemistry), Pharmaceutics III, Pharmaceutical Chemistry III, and Pharmacology II.

The grades of honours will be: first class (H1), upper second class (H2A), lower second class (H2B), and third class (H3).

### **Final Examination**

In order to register as a pharmaceutical chemist in Victoria students must pass the Final Examination which is conducted by the Pharmacy Board of Victoria. The syllabus for this examination is set out on page 60.

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 employers that the premises have received Board approval. This avoids any possible embarrassment, in respect of recognition of practical training.

### **Practical training**

The period of practical training prescribed by the Regulations is 60 weeks. Of this 60 weeks, at least 48 weeks must be served as a trainee under articles; and up to 12 weeks may be served during undergraduate-ship without being articulated. In all circumstances the practical training must be served in continuous periods of not less than 4 weeks.

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.

The Board will accept training, providing the establishment concerned has been approved by the Board, in a community pharmacy, a UFS dispensary, a hospital (whether public, private, repatriation, or attached to a branch of the armed services), a school of pharmacy, a university department of pharmacology, or the laboratory of a pharmaceutical manufacturer.

The Board will also approve the first year of the Master of Pharmacy programme at the Victorian College of Pharmacy Ltd as part of the practical training and will allow normally such M Pharm students to sit for the Final Examination twelve months after completing the requirements for Bachelor of Pharmacy.

To avoid embarrassment and possible loss of legal recognition, a check should be made to ensure that all premises, where practical training is sought, have been approved by the Board.

### **Articles**

Articles of traineeship may only be entered into after passing the Pharmacy III Examination. The forms of agreement, which must be completed in triplicate are available from the office of the Board, at \$1.00 per set. A fee of \$20.00 is charged for the registration of articles of traineeship.

## **Bachelor of Pharmacy Degree**

The degree of Bachelor of Pharmacy (B Pharm) is awarded to students who pass the Pharmacy III Examination. The regulations relating to the award of bachelor degrees are printed on page 63 and details of subjects are shown on page 17.

## **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 B Pharm degree.

To be eligible to enter the M Pharm programme students normally are expected to have obtained at least upper second-class honours at the B Pharm examination. In general terms this means that they must be in the upper tenth of the class list.

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 February of each year.

Each full-time student is eligible to apply for an Australian Government Post-graduate Award or a College Research Scholarship which provide support to the extent of approximately \$4620 gross per annum.

The regulations relating to the M Pharm degree are printed on page 65 and further information on the degree is provided on page 46.

## **Doctor of Philosophy degree**

*Intersearch.* Intersearch is a pharmaceutical graduate research programme conducted at the international level by the United States of America and Australia through the University of Kansas (USA), and the Pharmaceutical Society of Victoria (Australia). 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.

The Intersearch programme therefore offers a good quality American-type PhD degree. Further information, including details of financial support, may be obtained from the Dean of the Victorian College of Pharmacy Ltd who acts as Australian Secretary for the Executive Committee of Intersearch.

*University of Melbourne and Deakin University.* The University of Melbourne and Deakin University are willing to consider recommended B Pharm graduates for entry into external PhD programmes. In such cases joint supervision is required by the College and the University.

### **Graduate Diploma in Hospital Pharmacy**

Information on the Graduate Diploma in Hospital Pharmacy is provided on page 47.

### **COURSES OF STUDY**

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

- 1 The Pharmacy Board of Victoria
  - (a) determines 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) appoints the Board of Examiners; and
  - (c) controls and directs examinations at the Victorian College of Pharmacy Limited.
- 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, a student must pass the examinations in all the subjects prescribed for study during the first year of the course before the College will admit him 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 annual 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 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 The single subject credits referred to in rule 7 may not be held beyond the Pharmacy III Examination held in November of 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 Registrar immediately. In the case of sickness a medical certificate is required and must be forwarded to the Registrar within forty-eight hours of the time of consultation.
- 11 A candidate must observe the examination rules published on page 61 of this handbook by the Pharmacy Board of Victoria and the Victorian College of Pharmacy Limited.
- 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 61 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 will be required to meet the following charges:

Apparatus deposit*	\$40
Annual student membership of Pharmaceutical Society of Victoria	6
Annual subscription to the Victorian Pharmacy Students' Association	15
Service fee	<u>20</u>
	<u>\$81</u>

\* Refundable, less cost of breakages, at the termination of the course.

In addition to the above fees, approximately \$250 per annum is required for text-books, dissecting instruments, stationery, etc.

Students enrolling for the MPharm or Grad Dip Hosp Pharm course will be required to meet the following charges:

Annual subscription to the Victorian Pharmacy Students Association	\$7.50
Service fee	<u>\$10.00</u>
	<u>\$17.50</u>

Overseas students are also required to pay tuition fees amounting to \$1500 per annum.

**Examination fees**

Final Examination      \$20

**Australian Government means-tested allowances**

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

Regional Director  
 Victorian State Office  
 Department of Education  
 450 St Kilda Road  
 Melbourne Vic 3004  
 Telephone: 267 2988

**Royal Australian Chemical Institute (RACI)**

Bachelor of Pharmacy graduates from the Victorian College of Pharmacy Ltd, after a period of practical experience, are eligible to become Associates 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 Associates of RACI.

# First year

## PHARMACEUTICS I

A course of 75 lectures, 75 hours of practical work and 10 tutorials.

### 1. Professional Pharmacy

A series of 13 lectures and 27 hours practical work.

*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.

*Weights and measures.* The metric system of weights and measures, pharmaceutical calculations, mass-volume relationships, alcohol and acid dilutions, percentage formulae, wet and dry attenuations, alligation.

*Errors and tolerances.* Introduction to the Weights and Measures Act. The prescription balance, reciprocal sensitivity, legal tolerances in weighing and measuring, calculation of per cent error in weighing.

*Dispensing.* The qualities of a properly dispensed medicine and dispensing drill as applied to practical pharmacy.

*Legal aspects of pharmacy.* Sources of formulae, legal precedents for standards. Introduction to the Pharmacists Act, the Poisons Act and Schedules to the Poisons Act.

*Posology.* 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 overdoses.

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

### 2. Properties of Matter

A series of 12 lectures, and 15 hours practical work.

*Properties of solids.* Intermolecular forces, crystalline and amorphous structures, polymorphism. Stress and strain, elastic and plastic deformation.

*Properties of fluids.* Hydrostatics. Fluid flow, continuity and Bernoulli's equation. Stoke's Law. Turbulent and laminar flow.

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

*Surface properties.* Surface energy and surface tension. Wetting and capillarity. Surfactants, micellization, solubilization and detergency.

*Powder properties.* Particle size and distribution. Particle size determination. Flow properties and compaction.

### 3. Pharmaceutics of Solutions

A series of 25 lectures and 33 hours practical work.

*Introduction to biopharmaceutics.* Rate limiting steps, the importance of the dose form.

*Solutions and solvents.* Pharmaceutical solvents; solutes, mechanisms of solution; concentration. Factors affecting solubility, including temperature, pH and salt form.

*Dissolution rate.* Particle size, diffusional processes, Noyes Whitney equation; factors affecting dissolution rate; *in vitro/in vivo* correlation;

dose form uniformity tests.

*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 haemolytic method of Husa, the haematocrit method of Setnikar and Temelcou.

*Milliequivalents and millimoles.* The electrolytes of normal serum, electrolyte solutions for intravenous use, notation in prescriptions, calculations.

*Ionic equilibrium.* Physiological aspects of buffering, buffering to enhance drug stability. Pharmaceutical versus chemical buffers, mixed buffers, isotonic buffers, calculations.

*Solution formulation.* Aqueous systems, hydroalcoholic systems, non-aqueous systems, solubilization.

*Excipients.* Flavouring agents, colouring agents, antioxidants.

*Filtration.* Sieving, adhesion, absorption procedures; types of filters; filter aids; integrity of filters.

*Stability of solutions.* Introduction, shelf life, storage, effect of pH; stabilization.

*Solution dose forms.* Oral solutions, parenteral solutions, ophthalmic and nasal solutions; packaging.

### Practical

75 hours of practical work to illustrate the skills required in the preparation of pharmaceutical dose forms; to illustrate the principles of properties of matter, of physical pharmacy and the manufacture of solution dosage forms.

### Textbooks

*Australian Pharmaceutical Formulary*, 12th ed. Pharmaceutical Association of Australia and New Zealand.

Martin, A.N., Swarbrick, J. and Cammarata, A., *Physical Pharmacy*, 2nd ed. Philadelphia, Lea & Febiger, 1969.

*Office Consolidation.* Melbourne, Pharmacy Board of Victoria, 1973.

*Pharmaceutics I Laboratory Manual*, Melbourne, Victorian College of Pharmacy Ltd. 1981.

### References

#### *Australian Journal of Pharmacy*

Burns, D.M. and MacDonald, S.G.G., *Physics for Biology and Pre-Medical Students*, 2nd ed. Addison-Wesley, 1975.

*British Pharmacopoeia*, London, Pharmaceutical Press, 1980.

Carter, S.J. (ed) *Cooper and Gunn's Dispensing for Pharmaceutical Students* 12th ed. Pitman Medical, 1975.

Martindale's *Extra Pharmacopoeia*, 27th ed., London, Pharmaceutical Press, 1977.

*The Pharmaceutical Codex*, London, Pharmaceutical Press, 1979.

Parrott, E.L., *Pharmaceutical Technology*, Minneapolis, Burgess, 1970.

*Pharmaceutical Handbook*, 19th ed., London Pharmaceutical Press, 1980.

Shaw, D.J. *Introduction to Colloid and Surface Chemistry*, 2nd ed., London, Butterworth, 1970.

#### 4. Human Behaviour

A series of 25 lectures. The course is designed to instil into the students an appreciation of human behaviour and human experience and to enable them to understand the social psychology of pharmacy practice.

A *selection* from the following:

*Nature of psychology*, approaches, scope, research and measurement.

*Development*, factors governing development, early years, cognitive development, personality and social development, identification, adolescence, search for identity.

*Perception* an overview.

*Consciousness and control*, consciousness, sleep, dreams, psychoactive drugs and consciousness.

*Conditioning and learning*, classical, operant conditioning, reinforcement, cognitive and individualizing learning.

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

*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* — human abilities, genetic and environmental determinants of intelligence, testing aptitude and achievements, effects of age on body processes and intelligence.

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

*Conflict and stress*, frustration, anxiety, stress, defense mechanisms.

Assessment of this unit will *include* a 1500-2000 word essay. Suggested topics will be made available late in first term. The essay must be completed by the end of second term.

#### Textbook

Hilgard, E.R., Atkinson, R.C. and Atkinson, R.L. *Introduction to Psychology*, 7th ed., New York, Harcourt Brace, Javanovich, 1979.

or

Gazzaniga, M.S., *Psychology*, Harper & Row, 1980.

#### References

Braun, J.J. and Linder, D.E., *Psychology Today — An Introduction*, New York, Random House, 1979.

Chaplin, J.P., *Dictionary of Psychology*, Laval paperback, 1975.

Miller, G.A., *Psychology, The Science of Mental Life*, Pelican, 1977.

Warr, P.B., ed. *Psychology at Work*, 2nd ed. Penguin, 1978.

## PHARMACEUTICAL CHEMISTRY I

A course of 75 lectures and 75 hours of practical work.

### Physical and Analytical Chemistry

A course of 40 lectures.

*Chemical Bonding.* Quantum theory, atomic orbitals, hybridisation. Covalent bonds, valence-bond and molecular orbital theories. Polar molecules, intermolecular bonds, molecular association. Relative strengths of bonds.

*Spectroscopy.* Atomic emission and absorption. Molecular energy levels, electronic transitions, UV-visible and IR absorptions, the Beer-Lambert law. NMR and mass spectra.

*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 Waal's equation.

Liquids. Liquefaction of gases, vapour pressure of liquids, latent heat of vaporisation, the Clausius-Clapeyron equation.

*Solutions.* Gases in liquids. Vapour pressure and solubility, Henry's law.

Liquids in liquids. Vapour pressure of liquid mixtures, ideal behaviour, Raoult's law. Deviation from ideal behaviour, azeotropes.

Colligative properties of solutions. Osmotic pressure, the van't Hoff coefficient, isotonicity, membrane transport.

Colloidal solutions. Particle size, types of dispersions, lyophilic and lyophobic colloids, adsorption, peptization, coagulation, clays.

*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 mixtures, the phenol-water system. Partition between immiscible solvents, chromatography.

Three component systems. The miscibility of toluene, ethanol and water, triangular diagrams.

*Ionic equilibria in solution.* Dissociation, solubility product, stability constant, ionic product for water. The pH scale, solutions of weak acids and bases, indicators, amphoteric electrolytes, isoelectric point, ion exchange resins. Buffer solutions, buffer capacity and efficiency, buffers in blood. The pH-partition hypothesis.

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

*Electrochemistry.* Ionic conductance, Kohlrausch's law, conductometric titrations, ionic mobility, electrolysis. Electrochemical cells, half-cell reduction potentials, the Nernst equation, cell potential and free energy. Concentration cells, transference of ions, junction potentials. Potentiometric titrations. pH measurement, the glass electrode.

*Thermodynamics.* Heat and work, conservation of energy, internal energy, enthalpy, heat capacity. Thermochemistry, bond energies, resonance energy. Reversible and irreversible processes, entropy, free energy.

*Co-ordination chemistry.* Formation, stability and nomenclature of complex ions. Chelation and organo-metallic complexes in biological systems.

*Drug analysis.* Application of analytical techniques to pharmaceutical products. Analysis of biological fluids for drugs and metabolites.

### Textbooks

Wallwork, S C and Grant, D J W, *Physical chemistry for students of pharmacy and biology*, 3rd ed London, Longman, 1977.

Aylward, G and Findlay, T, *SI chemical data*, 2nd ed Sydney, Wiley, 1974.

### References

Morris, J G, *A biologist's physical chemistry*, London, Arnold, 1968.

Martin, A N, Swarbrick, J and Cammarata, A, *Physical pharmacy*, 2nd ed Philadelphia, Lea and Febinger, 1969.

### Organic and Medicinal Chemistry

A course of 35 lectures.

*Structure and properties of organic molecules.* Bonding, isomerism, stereochemistry and nomenclature of carbon compounds.

An introduction to the use of spectroscopic methods in structure determination and identification of organic compounds.

*Preparation and 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, amines and other nitrogenous compounds, thiols and other sulphur containing molecules.

Examples of polyfunctional molecules such as amino acids, amino alcohols, catecholamines 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.

*Chemotherapeutic agents.* Influence of such factors as shape, size, ionization state, solubility and substituent groups on the biological action of sulphonamides, aminoacridines and other chemotherapeutic agents. Role of enzyme inhibition and drug receptor interaction in the activities of these drugs.

### Textbook

Hart, H and Schuetz, R D, *Organic Chemistry*, 5th ed Boston, Houghton Mifflin Company, 1978.

### References

Albert, A, *Selective toxicity*, 6th ed London, Chapman Hall, 1979.

### Supplementary Material

*Framework molecular models*, Prentice-Hall Inc., NJ, USA.

### 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 in the laboratory.

The marks awarded for practical work form part of a student's total assessment.

### Textbooks

*Pharmaceutical chemistry I laboratory manual*, Melbourne, Victorian College of Pharmacy Ltd, 1981.

### References

Beckett, A H and Stenlake, J B, *Practical pharmaceutical chemistry*, 2nd ed London, Athlone Press, Pt, 1, 1968, Pt 2, 1970.

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.



## PHYSIOLOGY

A course of 75 lectures and 75 hours of practical work.

### 1. *Basic cell physiology*

*An introduction to cellular biochemistry and metabolism.* Constituents of cells, proteins, nucleic acids, carbohydrates, lipids, enzymes and enzyme inhibition. Bioenergetics, concept of free energy change, exergonic and endergonic reactions, ATP, energy-rich and energy-poor bonds, biological oxidations and oxidative phosphorylation, photosynthesis. Aerobic and anaerobic glycolysis, citric acid cycle. Macro and micro nutrients.

*Cellular structure.* General structure and functioning of cells, cytoplasm, lysosomes, mitochondria, endoplasmic reticulum, Golgi complex, ribosomes, centrosomes, nucleus.

*Cellular reproduction and genetics.* Genetics, Mendel's work, laws of independent segregation and random assortment of allelic pairs. Chromosome replication and division, mitosis and meiosis. Linkage and crossing over, chromosome maps. Sex determination and x (sex) linkage. Mutations and chromosomal abnormalities. Breeding systems. Heterosis. Genetic variability and evolution. Pharmacogenetics. Genetic counselling.

### 2. *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 polarization and of inorganic ions on membranes. Physiological salt solutions.

*Synaptic transmission.* Origin and transmission of nerve impulse. The generator potential. Axo-dendritic, axosomatic and axo-axonal synapses. Excitatory and inhibitory post-synaptic potentials, pre-synaptic inhibition. Neuronal pools. Neuroeffector junctions. Humoral transmission. Facilitation and blockade. Characterisation of transmitters. The autonomic nervous system, an introduction.

*Properties of muscle.* Physiology of skeletal muscle, contractile and elastic components, isotonic and isometric contractions, twitch and tetanus. Ultrastructure of muscle and sliding filament theory. Focally and multiply-innervated fibres. Structure and properties of cardiac muscle and its conducting system. Electrical activity of cardiac muscle membranes, the ECG. Smooth muscle, structure, location and function. Multi-unit and single-unit muscle. Vascular smooth muscle. Electrical activity of smooth muscle membranes.

### 3. *General physiology*

*Nervous system.* General organization of nervous system. Development of major structures of vertebrate brain. Autonomic and somatic nervous system. Organization of spinal cord and simple reflex arcs. Receptors and receptor organs. Nerve degeneration and regeneration.

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

*Skeleton and skeletal muscle.* General structures and function. Joints. Movement.

*Circulation.* Basic mammalian circulatory system. Heart. Vasculature. Cardiovascular mechanics and control of circulation.

*Respiration.* Structure and function of the respiratory system. Gaseous exchange and transport. Respiratory pigments. Control of respiration. Effects of change of environment.

*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 homoiotherms. Control mechanisms, temperature receptors, sweat glands, vascular changes.

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

*Reproduction and early embryological development.* Asexual and sexual reproduction. Oestrus and menstrual cycles and their hormonal control. Fertilization, implantation and initial developmental stages. Embryology. Teratology. Formation and physiology of the placenta. Pregnancy, parturition, lactation. Contraception, infertility.

*Blood and body fluids.* Plasma, formed elements. Anaemias. Clotting mechanism and anticoagulants. The fibrinolytic system. Cerebrospinal fluid. Extracellular fluid and lymph.

*Basic biology.* Basic biology of fungi, viruses, unicellular organisms and invertebrates. Their relationship to health and disease. Protective mechanisms in the body.

## Practical

Practical work and tutorials will be based on the material dealt with in lectures.

Students must provide themselves with dissecting instruments. A list of these will be posted in the department.

## Textbooks

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

Dorlands Pocket Medical Dictionary, 22nd ed Saunders, 1977.

Ganong, W F, *Review of medical physiology*. 8th ed Los Altos, Lange, 1977.

Goldsby, R A, *Cells and energy*. 2nd ed Collier Macmillan London, 1977.

Guyton, A C, *Basic human physiology: Normal function and mechanisms of disease*. 2nd ed Philadelphia, Saunders, 1977.

McNaught, A B and Callander, R, *Illustrated physiology*. 3rd Rev ed Edinburgh, Churchill Livingstone, 1975.

Vander, A J, Sherman, J H and Luciano, D S, *Human physiology*. 2nd ed New York, McGraw-Hill, 1975.

*Physiology Laboratory Manual Parts 1 and 2*. Melbourne, Victorian College of Pharmacy Ltd, 1981.

## References

- Katz, B, *Nerve muscle and synapse*. New York, McGraw-Hill, 1966.  
Levine, F P, *Genetics*. 2nd ed New York, Holt, Rinehart and Winston, 1968.  
Loewy, A G and Siekevitz, P, *Cell structure and function*. 2nd ed New York, Holt, Rinehart and Winston, 1970.  
Moody, P A, *Genetics of man*. 2nd ed Norton and Company, 1975.  
Rose, S, *The chemistry of life*. Harmondsworth, Penguin, 1977.

## Preliminary Reading

The following texts may be of general interest to students who enter the course without having prior background knowledge in biology.

- Morris, D, *The naked ape*. New ed London, Mayflower, 1977.  
Viltee, C A, *Biology*. 7th ed Philadelphia, Saunders, 1977.  
Weisz, P B, *The science of zoology*. 2nd ed New York, McGraw-Hill, 1973.

## Mathematics

A course of 50 lectures and 30 hours of practical work and tutorials.

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

### 1. Computer Studies

*Hardware.* Main components of a computer system and their function.

*BASIC language.* Elementary statements, flowcharting, timeshare commands, loops, one and two dimensional arrays, string variables and files.

*Applications of Computers.* Information storage and retrieval, prescription control systems, stock ordering systems and data logging.

Using the College's minicomputer timeshare system, the student will be required to write and run programming assignments. The assignment problems will be taken from the Calculus and Statistics sections of the course and will also highlight the use of computers to store and retrieve information.

### 2. Calculus

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

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

*Integration methods.* By parts, algebraic 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, Noyes-Whitney equation), 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 and Simpson's Rule).

*Differential Equations.* Solution of ordinary differential equations by separation of variables, integrating factor and Laplace Transform methods. Partial differential equations, the unsteady state diffusion equations. Fick's Law of Diffusion.

### 3. Statistics

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

*Measures of Central Tendency and Dispersion.* Mode, median, arithmetic and geometric mean. Skew of a distribution. Standard deviation, variance and degrees of freedom.

*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.

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

#### Textbooks

- Abbott, P, *Calculus*. Hodder and Stoughton (Teach Yourself Books).  
Wonnacott, T H and Wonnacott, R J. *Introductory Statistics*. Edition 3. Wiley International.

#### References

- De Rossi, C J, *Learning BASIC fast*. Reston Publishing Co, 1974.  
BASIC/1000D Multi-User Real Time BASIC. Reference Manual.  
Hewlett Packard. (available in the Computer Centre).  
Lentner, M *Introduction to Applied Statistics*. Prindle, Weber and Schmidt, 1975.  
Martin, A N, Swarbrick, J and Cammerata, A, *Physical Pharmacy*. 2nd ed. Philadelphia, Lea and Febiger, 1969.

## Second year

### PHARMACEUTICS II (including Microbiology)

A course of 87 lectures and 150 hours of practical work.

#### Pharmaceutics

A course of 46 lectures.

*Introduction to biopharmaceutics.* Rate limiting steps, the importance of the dose form.

*Solutions and solvents.* Pharmaceutical solvents; solutes; solution characteristics; mechanisms of solution; temperature effects; dissolution rate; solution formulation; hygrometry; filtration; freeze and spray drying.

*Surface and interfacial behaviour.* Fundamentals and definitions of surface and interfacial free energy, adhesion and cohesion, spreading, wetting. Surface properties of solutions including surfactant chemistry and classification, Gibbs equation, micellization. Insoluble firms, solubilization, detergency, aerosols, foams and defoaming.

*Complexation.* Classification; introduction to drug binding; chemical interaction; ion exchange.

*Containers.* Glass and glass containers; plastics and plastic containers; metal tubes; closures.

*Rheology.* Rheological principles and classification of behaviour; chemical and physical factors affecting rheological properties; application of rheology in product design; rheology of interfaces and solids; instrumentation.

*Emulsions.* Theories of emulsification; emulsion type; HLB; emulsion stability; formulation and applications.

*Solid-liquid dispersions.* Colloidal systems; kinetic, optical, electrical properties of solid-liquid dispersions. Extensions of the DLVO theory of stability to suspensions; nucleation and ageing; gels; semi-solids. Encapsulation.

*Ionic equilibrium.* Drug solutions as buffers; isotonic buffers.

*Powders.* The importance of particle size in pharmaceutical preparations. Flow properties in relation to particle size. Particle size determination, microscopy, sedimentation, sieving, gas adsorption, Coulter counter.

#### Practical Pharmaceutics II

A course of 75 hours of laboratory work divided into 5 units. The work is scheduled to co-ordinate with the lectures. Demonstrations and three tests are scheduled. Students will also investigate the formulation of one class of OTC products.

*Solutes and solutions.* Investigation of factors important in solution formulation including solvent-solute interactions, particle size, cosolvency, *in situ* procedures and availability of active ingredient. Strong interactions between various components of a formulation will also be investigated.

*Bulk and interfacial properties of surfactant solutions.* The interfacial properties of surfactant solutions are used to predict behaviour in the bulk of the solution as well as interactions between molecules at the interface. Various ways of increasing the amount of active ingredient in a formulation are studied.

*Liquid in liquid dispersions.* Investigation of factors important in formulating this type of drug delivery system and the overcoming of formulation and stability problems using these factors.

*Rheology.* An investigation of the rheological behaviour of pharmaceutical vehicles and products.

*Solid in liquid dispersions.* Production of a particle size distribution and an investigation of the factors important in suspension stability. Use of these factors in overcoming formulation and stability problems.

### Textbooks

*Australian pharmaceutical formulary.* 12th ed Melbourne. Pharmaceutical Association of Australia and New Zealand, 1978.

*Extra pharmacopoeia: Martindale.* 27th ed London, Pharmaceutical Press, 1977.

Martin, A N, Swarbrick, J and Cammarata, A. *Physical pharmacy.* 2nd ed Philadelphia, Lea and Febiger, 1969.

*Office consolidation.* Melbourne. Pharmacy Board of Victoria, 1973.

*Pharmaceutics II Laboratory Manual.* Melbourne, Victorian College of Pharmacy Ltd, 1981.

Shaw, D J, *Introduction to colloid and surface chemistry.* 2nd ed London, Butterworth, 1970.

### References

Becher, P, *Emulsions: theory and practice.* 2nd ed New York, Reinhold, 1965.

*The pharmaceutical codex.* London, Pharmaceutical Press, 1979.

*British pharmacopoeia.* London, Pharmaceutical Press, 1980.

Lachman, L, Lieberman, H A and Kanig, J L, *The Theory and Practice of Industrial Pharmacy.* 2nd ed Philadelphia, Lea and Febiger, 1976.

Parrott, E L, *Pharmaceutical technology.* Minneapolis, Burgess, 1970.

### Microbiology

A course of 41 lectures and 75 hours of practical work, covering the following topics to the introductory level.

Historical development: the microscope, germ theory of infectious disease, Koch's postulates.

Microbial world: the protista, fungi, algae, protozoa and lower protista.

Outline of main groups with important examples: blue-green algae, bacteria, rickettsia, chlamydiae, viruses.

Principles of classification.

Occurrence and role of microorganisms in the biosphere.

Basic morphological features of bacteria, fungi and viruses.

Prokaryotic cell: biochemistry and function of major structures: cell wall, capsule, appendages, membrane, inclusions, spores, ribosomes, nuclear material. Comparison of prokaryotic and eukaryotic cells.

Metabolism: summary treatment of exoenzymes, catabolism and microbial metabolic pathways.

Nutrition of microorganisms, cell division and growth of microorganisms.

Death of microorganisms, kinetics and mechanisms.

Disease and infection, carrier state, sub-clinical infection, portals of entry and exit, host-parasite relationships.

Introductory microbial genetics, molecular mechanisms of mutation, mutagenicity testing.

Variation and adaptation.

Transferable drug resistance.

Mechanisms of pathogenesis, toxins, antiphagocytic activity, inflammatory damage.

Non-specific host resistance: natural barriers, inflammation, phagocytosis, and lymphatic system.

Acquired specific immunity, antigens, antibodies, cell-mediated immunity. Vaccines and sera.

Hypersensitivity; allergy and adverse drug reactions.

Pathogens associated with the alimentary tract, the urinary and genital tract, and the respiratory tract.

Pathogens from soil; superficial and cutaneous mycoses. Pathogens of the eye and skin.

Viruses, antiviral agents.

Epidemiology of infectious disease.

Introduction to chemotherapy and disinfection.

Principles and practice of sterilization, aseptic dispensing and sterility assurance.

### Practical Microbiology

A course of 75 hours of practical work to include basic techniques in light microscopy, staining, aseptic procedures and cultivation of bacteria and viruses; isolation of pure cultures; nutrient and selective media; factors affecting bacterial growth, biochemical activities and distribution of bacteria; fungal morphology; fungal and bacterial spores. Production and assay of some antibiotics; bacterial sensitivity to antibiotics; evaluation of antimicrobial agents; evaluation of procedures for the destruction or removal of microorganisms; investigation of the immune response; applied topics such as introductory serological procedures and processes to prepare, and control the production of sterile pharmaceuticals.

### Textbooks

Hugo, W B and Russell, A D, *Pharmaceutical Microbiology*. Melbourne, Blackwell Scientific Publications, 1977.

Jawetz, E, Melnick, J L and Adelberg E A, *Review of medical microbiology* 14th ed Los Altos, Lange Medical Publications, 1980.

*Microbiology Laboratory Manual*. Melbourne, Victorian College of Pharmacy Ltd, 1981.

### References

Bowry, T R, *Immunology simplified*. Oxford, Oxford University Press, 1977.

Brock, T D, *Biology of microorganisms*. 2nd ed Englewood Cliffs, Prentice-Hall, 1974.

Davis, B D et al, *Microbiology*. 3rd ed New York, Harper & Row, 1979.

Fenner, F J and White, D O, *Medical virology*. 2nd ed New York, Academic Press, 1976.

Garrod, L P, Lambert, H P and O'Grady, F, *Antibiotic and chemotherapy*. 4th ed Edinburgh, Livingstone, 1973.

Mims, C A, *Pathogenesis of Infectious Disease*. London, Academic Press, 1977.



Perkins, J J, *Principles and methods of sterilization in health sciences*.  
2nd ed Springfield, Ill, Thomas, 1973.  
Turco, S and King, R E, *Sterile Dosage Forms*. 2nd ed Philadelphia,  
Lea and Febiger, 1979.

## PHARMACEUTICAL CHEMISTRY II

A course of 75 lectures and 150 hours of practical work.

### Physical and Analytical Chemistry

*Spectroscopy.* Energy levels for rotational, vibrational and electronic transitions, chromophores, atomic and molecular emission and absorption. Fluorescence, atomic absorption and emission, uv/vis techniques, isobestic point, apparent deviations from Beer's law, drug analysis.

*Gaseous equilibria.* Reversible reactions,  $K_p$  and  $K_c$ , homogeneous and heterogeneous systems, catalysis.

*Thermodynamics.* First law; Kirchhoff's equations. Second law; entropy, molecular basis of entropy, free-energy function, spontaneity of reaction,  $\Delta G$  and the equilibrium constant, the van't Hoff equation, the Gibbs-Helmholtz equation, interrelation of emf and thermodynamic constants. Third law; the Nernst heat theorem, absolute entropy, use of third law. Activity; fugacity and activity functions, determination of activity co-efficients for gases and binary liquids.

*Electrochemistry.* Electrochemical cells; chemical and concentration cells, determination of physico-chemical constants. Electrolytes in solution; ionic strength, junction potentials, pH and activity coefficients, pH measurements, determination of activity coefficients, the Debye-Hückel theory. Applications; Donnan membrane equilibria and ion-selective electrodes.

*Kinetics.* Homogeneous reactions; pseudo orders, reaction rate and temperature, steady-state theory, reaction mechanisms. Catalysis; heterogeneous reactions, Langmuir and Freundlich adsorption isotherms, qualitative aspects of multilayers. Applications; drug stability and shelf life, adsorption chromatography, enzyme kinetics, drug interactions.

*Phase equilibria.* Single component systems; Clausius-Clapeyron equation. Two component systems; partially miscible liquids, solid solutions with congruent or incongruent melting points, salt hydrates.

*Distribution in liquid/liquid systems.* The Nernst distribution law, effect of equilibrium reactions in one phase, effect of partial miscibility. Applications; chromatography and solvent extraction in analytical chemistry.

*Chemical structure and biological activity.* Drug absorption and distribution, drug design using Hammett/Hansch equations.

*Co-ordination chemistry.* Inorganic complexes; brief qualitative applications of crystal field theory, colour/magnetic susceptibility and stability, chelation. Applications; sequestering of metal ions, interactions with drugs.

*Clinical chemistry.* Chemical methods used in diagnostic testing, clinical and analytical chemistry.

### Textbooks

As prescribed for Pharmaceutical Chemistry I and Griffiths, P J F and Thomas, J D R, *Calculations in advanced physical chemistry. (SI units)*. 2nd ed London, Arnold, 1971.

## References

- As prescribed for Pharmaceutical Chemistry I and  
Maron, S H and Lando, J B, *Fundamentals of physical chemistry*,  
London, Collier-Macmillan, 1974.  
Martin, A N, Swarbrick, J and Cammarata, A, *Physical pharmacy*. 2nd  
ed Philadelphia, Lea and Febiger, 1969.  
Moore, W J, *Physical chemistry*. 5th ed London, Longmans, 1972.  
Knight, A R, *Introductory physical chemistry*. Englewood Cliffs,  
Prentice-Hall, 1970.

## Organic Chemistry

Extension of the work of first year in the preparation and reactions of aliphatic and aromatic compounds.

Study of selected classes of polyfunctional compounds including polyhydric alcohols, unsaturated alcohols, aldehydes and acids; hydroxy acids, aldehydic and ketonic acids, dibasic acids and their important derivatives, amino acids and proteins, carbohydrates. Important biological properties of these compounds will be considered.

A more detailed study of stereochemistry and nomenclature.

Introduction to heterocyclic chemistry.

Extension of the study of electronic interpretations and mechanisms of organic reactions.

Spectrophotometry; principles and applications of UV, IR, NMR, and mass spectroscopy.

Selected groups of drugs in common use will be discussed in detail.

## Textbooks

Creswell, C J, Runquist, O and Campbell, M M, *Spectral Analysis of Organic Compounds. An Introductory Programmed Text*. 2nd ed Minneapolis, Burgess, 1972.

Morrison, R T and Boyd, R N, *Organic chemistry*. 3rd ed Boston, Allyn and Bacon, 1973.

Sykes, P, *A guidebook to mechanism in organic chemistry*. 4th ed Harlow Essex, Longmans, 1975.

## Supplementary material

*Framework molecular models*. Prentice-Hall.

## Practical

A course of 150 hours of practical work.

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.

*Organic.* Unit operations: crystallization, filtration, distillation, sublimation, extraction, steam distillation, thin layer, gas and column chromatography.

*Preparative.* Experiments using common reagents and reactions.

*Qualitative.* Systematic qualitative organic analysis by chemical and instrumental methods. Simulated organic analysis by computer techniques.

*Quantitative.* Analysis of pharmaceutical compounds by gravimetric, volumetric, colorimetric and complexometric analysis.

*Physical.* Investigation of adsorption, distribution, solubility product, equilibrium constant, kinetics, heat of reaction, liquid-vapour equilibrium and electrode potentials.

*Instrumental.* Quality control of pharmaceuticals by potentiometric and conductometric titrations, spectrophotometry, polarography, and atomic absorption methods.

### Textbooks

*Pharmaceutical Chemistry II Organic Chemistry Laboratory Manual.* Melbourne, Victorian College of Pharmacy Ltd, 1981.

*Pharmaceutical Chemistry II Physical and Analytical Chemistry Laboratory Manual.* Melbourne, Victorian College of Pharmacy Ltd, 1981.

Vogel, A I, *Elementary practical organic chemistry.* Pt 2 *Qualitative organic analysis.* 3rd ed Harlow Essex, Longmans, 1980.

### Reference

Bassett, J (ed), *Vogel's textbook of quantitative inorganic analysis*, 4th ed, London, Longmans, 1978.

NOTE The balance of the refundable deposit from first year will be retained in second year to cover the cost of replacing damaged or cleaning dirty apparatus. Any student who has had excessive breakages in first year, which have been deducted from the deposit, may be required to lodge a further deposit.

## PHARMACOLOGY I

A course of 55 lectures and 57 hours' practical work.

*Pharmacology of neuroeffector systems.* Humoral transmission. Historical background. Synthesis, storage, release, metabolism and termination of action of acetylcholine, noradrenaline and other transmitters. Pharmacological activity of acetylcholine and noradrenaline. Drugs which mimic and antagonize the muscarinic and nicotinic actions of acetylcholine. Skeletal neuromuscular function, competitive and depolarizing blocking drugs. Agonists and antagonists at  $\alpha$ - and  $\beta$ -adrenoreceptors. Drugs affecting the synthesis, storage, release and inactivation of neurotransmitters. The role of calcium in transmission and effector organ function. Membrane stabilizers and labilizers. Local anaesthetics. Neurotoxins.

*Autacoids.* Synthesis, storage, release, metabolism and pharmacological actions of substances such as histamine, 5-hydroxytryptamine, kinins, prostaglandins. 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.

*Drug-receptor interactions.* Theories of drug action. Kinetics of drug-receptor interactions, occupation theory, rate theory. Agonists, dualists, antagonists.

*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 arrhythmias, sinus, atrial and ventricular arrhythmias, conduction block. Production and suppression of cardiac arrhythmias by drugs. The pumping action of the heart, events of the cardiac cycle, heart sounds, the venous pulse. 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, cerebral, splanchnic, muscle and skin circulations. Integrative analysis of the circulation, hypertension, shock and congestive heart failure. Drugs used in the treatment of cardiac failure and ischaemic heart disease. Atherosclerosis and drug treatment of hyperlipidaemia. Therapeutic regimes in hypertension, shock and peripheral vascular disease.

*Renal physiology and pharmacology.* Ultrastructure of the kidney. The formation of urine. Active transport systems in the nephron, competition, saturation and inhibition. Regulation of acid-base and water balance. Diuretics, mechanisms of action. Mobilization of oedema fluid. Treatment of diuretic-induced hypokalaemia. Aldosterone and the renin-angiotensin system, spironolactone. Renal disease.

### Practical

*In vivo* and *in vitro* experiments to illustrate principles discussed in the lecture course.

### Textbooks

- Bowman, W C and Rand, M J, *Textbook of pharmacology*. 2nd ed Oxford, Blackwell, 1980.
- Ganong, W F, *Review of medical physiology*. 8th ed Los Altos, Lange, 1977.
- Meyers, F H, Jawets, E and Goldfien, A, *Review of medical pharmacology*. 6th ed Los Altos, Lange Med Publ. 1978.
- Pharmacology I Laboratory Manual*. Melbourne, Victorian College of Pharmacy, 1981.

### References

- Bell, G H, Emslie-Smith, D and Paterson, C R, *Text-book of physiology and biochemistry*. 9th ed Edinburgh, Churchill Livingstone, 1976.
- Day, M D, *Autonomic Pharmacology*. Edinburgh, Churchill Livingstone, 1979.
- Goldstein, A, Aronow, L and Kalman, S M, *Principles of drug action*. 2nd ed New York, Wiley, 1974.
- Goodman, L S and Gilman, A, *The pharmacological basis of therapeutics*. 6th ed London, Collier-Macmillan, 1980.
- Laurence, D R, *Clinical pharmacology*. 4th ed Edinburgh, Churchill Livingstone, 1973.
- Melmon, K L and Morrelli, H F, *Clinical pharmacology*. 2nd ed, New York, Macmillan, 1978.
- Netter, F H, *Nervous system*. New York, Ciba Foundation, 1974. (Ciba Collection of Medical Illustrations, Vol 1.)
- Netter, F H *Heart*. New York, Ciba Foundation, 1974. (Ciba Collection of Medical Illustrations, Vol 5.)
- Rand, M J, Raper C and McCulloch, M W, *An Introduction to the physiology and pharmacology of the autonomic nervous system*. Melbourne, Australasian Pharmaceutical Publishing Co Ltd, 1975.
- Rogers, H and Spector, R, *An introduction to mechanisms in pharmacology and therapeutics*. London, Heinemann. 1976.
- Selkurt, E E, *Physiology*. 4th ed Boston, Little Brown, 1976.
- Vander, A J, Sherman, J H and Luciano, D S, *Human physiology*. 2nd ed New York, McGraw-Hill, 1975.

## BIOCHEMISTRY

A course of 20 lectures and 21 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; sphingomyelins; 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; co-factors; 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.

### **Practical Biochemistry**

*Enzymes.* Enzyme kinetics. Determination of the Michaelis' constant of serum cholinesterase and the mode of inhibition by echothiophate.

*Bioenergetics.* Comparison of acid lability of phosphoryl derivatives, enzymic hydrolysis of ATP.

*Carbohydrate metabolism.* Effects of glucose, insulin, adrenaline, tolbutamide and glucagon on blood sugar levels.

*Protein metabolism.* Activity of liver alanine aminotransferase. Blood urea determination.

*Lipids.* Thin layer chromatography of plasma lipids.

*Nucleic Acids.* Determination of liver DNA and RNA content.

### Textbooks

*Biochemistry Laboratory Manual.* Melbourne, Victorian College of Pharmacy Ltd, 1979.

Conn, E E and Stumpf, P K, *Outlines of biochemistry.* 4th ed New York, Wiley, 1976.

### References

Bhagavan, N V, *Biochemistry. A comprehensive review.* 2nd ed. Philadelphia Lippincott, 1978.

Gourley, D R H, *Interaction of drugs with cells.* Springfield, Thomas, 1971.

Harper, H A, *Review of physiological chemistry.* 16th ed Los Altos, Lange, 1977.

Lehninger, A L, *Biochemistry.* 2nd ed New York, Worth, 1975.

McGilvery, R W, *Biochemistry. A functional approach.* 2nd ed Philadelphia, Saunders, 1979.

Watson, J D, *Molecular biology of the gene.* 3rd ed New York, Benjamin, 1976.



## Third year

### PHARMACEUTICS III

A course of 75 lectures and 150 hours of practical work. In addition there will be a non-examinable course of 4 tutorials consisting of case studies in professional pharmacy.

*Technology.* Granulation, effervescent granules, wet granulation, mechanical granulators. Tablets, manufacturing processes, compression machines, formulation, testing, coating. Veterinary dose forms.

*Drug stability.* Introduction, applied kinetics, shelf-life, storage, accelerated ageing, pH profiles of hydrolysis, solvents and catalysts, photochemical reactions and suncreening, the stabilities of some representative drugs, oxidation, stabilization.

*Incompatibility.* Professional aspects, representative physical and chemical incompatibilities. *In vivo* drug interactions, basic principles, mechanisms, examples.

*Biopharmaceutics.* pH-partition hypothesis, properties of membranes and mechanisms of drug transfer across membranes. Factors affecting gastrointestinal absorption, percutaneous absorption and other routes of absorption. Kinetics of absorption, distribution, metabolism and excretion. Pharmacokinetic models; apparent volume of distribution. Factors affecting metabolism and excretion, biological half-life of drugs. Protein and tissue binding. Bioavailability and its measurement. Absorption promoters. Formulation effects on drug action, disintegration and dissolution testing; correlation of *in vitro* tests with *in vivo* studies. Generic and batch-to-batch equivalence. Prediction of drug blood levels from dosage regimes. Techniques used to prolong drug effects. Pro-drugs. Theory and technology of sustained release preparations; microencapsulation, liposomes. Physiological factors in drug action, drug response in pathological states, paediatric and geriatric posology. Biopharmaceutics of drug interactions.

*Applied pharmaceutical microbiology.* Antibiotics: sources, modes of action, spectra of activity, toxicology and problems of drug resistance.

*Pharmaceutical information.* Sources and retrieval, pharmaceutical aspects of computerization.

*Industrial pharmacy.* Management. Good manufacturing practices. Statistical control of product quality. Drug recall. Industrial equipment with special emphasis on blending and coating operations.

*Patient counselling.* Communication skills, non-verbal communication, effective interviewing.

### Practical Pharmaceutics III

The manufacture of tablets, tablet coating, tablet testing. Preparation of ointments, creams, suppositories, etc. General dispensing. Formulation.

Sterilization, sterility testing, preparation and testing of injections, large volume intravenous solutions, ophthalmic preparations.

Investigational projects in Biopharmaceutics. Practical tutorials in calculations, incompatibilities, drug interactions, and pharmacokinetics.

### Textbooks

- Australian pharmaceutical formulary and handbook*. 12th ed Adelaide, Pharmaceutical Association of Australia and New Zealand, 1978.
- Extra pharmacopoeia: Martindale*. 27th ed London. Pharmaceutical Press, 1977.
- Garrod, L P, Lambert, H P and O'Grady, F, *Antibiotic and chemotherapy*. 4th ed Edinburgh and London, Livingstone, 1973.
- Martin, A N, Swarbrick, J and Cammarata, A. *Physical pharmacy*. 2nd ed Philadelphia, Lea and Febiger, 1969.
- Pharmaceutics III Laboratory Manual*. Melbourne, Victorian College of Pharmacy Ltd, 1981.

### References

- British Pharmacopoeia (Veterinary)*. 2nd ed London, HMSO, 1977.
- Journal of pharmacy and pharmacology*.
- Journal of pharmaceutical sciences*.
- Lachman, L, Lieberman, H A and Kanig, J L, *The theory and practice of industrial pharmacy*. 2nd ed Philadelphia, Lea and Febiger, 1976.
- Parrott, E L, *Pharmaceutical technology*. Minneapolis, Burgess, 1970.
- Perkins, J J, *Principles and methods of sterilization in health sciences*. 2nd ed Springfield, III, Thomas, 1970.
- Treleaven, G K (ed), *Prescription proprietaries guide*. 9th issue. Melbourne, Australasian Pharmaceutical Publishing Co, 1980.

## PHARMACEUTICAL CHEMISTRY III

A course of 75 lectures and 150 hours of practical work.

*Relationship of chemical property and structure to biological activity*. Solubility, partition coefficient, surface activity, degree of dissociation, acidity constant, redox potential, resonance, hydrogen bonding, interatomic distance, chelation, isosterism.

*Pharmacodynamics, stereochemistry and structure-activity relationships*. Cholinergics, anticholinergics, adrenergics, adrenergic blocking agents, histamine and antihistaminics, prostaglandins.

*Compounds affecting the central nervous system*. Structure activity relationships and chemical properties of analgesics, sedatives, hypnotics, tranquilisers, antidepressants, CNS stimulants, hallucinogenic agents.

*Chemotherapy*. Dyes, arsenicals, sulphonamides, antituberculous compounds, specificity of structure, antimalarials.

*Antibiotics.* Penicillins and cephalosporins, streptomycin, chloramphenicol, antinomycins, tetracyclines, erythromycin and griseofulvin.

*Steroids.* Sterols, stereochemical properties and reactions, conformation analysis, biosynthesis, bile salts, steroid hormones, cardioactive glycosides, steroidal alkaloids.

*Terpenes and fat soluble vitamins.* Monoterpenes, diterpenes, sesquiterpenes, carotenes, vitamins A, D, E and K.

*Water soluble vitamins.* Vitamin B series and vitamin C.

*Alkaloids.* The structure and properties of selected alkaloids of pharmaceutical interest.

*Data systems.* Applications of computers in chemistry, chemical and drug information systems, Wiswesser Notation.

*Radiochemistry.* Radioactivity, production and use of tracers, transuranic elements, separation and use of non-radioactive isotopes, biological aspects of radiation, radiopharmaceuticals.

*Biosynthesis and metabolism.* The biosynthesis and metabolism of biologically important molecules.

*Analytical pharmaceutical chemistry.* Analytical techniques used in pharmaceutical science. Analysis of drugs and chemicals. Analysis of drugs in biological systems. Quality control procedures. Diagnostic methods and clinical chemistry.

*Topical research.* A chemical review of major current research papers in the pharmaceutical sciences. The literature of medicinal chemistry.

*General topics.* Reference will be made to the following groups of compounds which are not easily placed in distinct chemical classes because of the diversity of structure of compounds showing a given biological activity. Some compounds may have also been considered elsewhere in the syllabus. Thyroid hormones and antithyroid drugs, anti-inflammatory agents, diuretics, antihypertensive agents, cardiac drugs, coagulants and anticoagulants, hypoglycaemic agents.

*Drug design.* Molecular design, miscellaneous factors, examples of drug design.

## References

- Albert, A, *Selective toxicity*. 6th ed. London, Chapman Hall, 1979.  
Burger, A, *Medicinal chemistry*. 4th ed, New York, ed 6, M Wolff, Interscience, 1979.  
Foye, O F, *Principles of Medicinal Chemistry*. Philadelphia, Lea and Febiger, 1974.  
Wilson, C O, Gisvold, O and Doerge, R F. *Text-book of organic medicinal and pharmaceutical chemistry*. 7th ed Philadelphia, Lippincott, 1977.

## Practical

*Organic.* Preparation of organic compounds, including compounds of pharmaceutical interest. Separation of mixtures, identification and characterisation of unknown organic compounds, including the use of spectroscopic methods. Metabolism. Application of computers in drug information systems. Applications of instrumental techniques in pharmaceutical science.

*Physical and analytical.* Analysis of drugs. A research project will be undertaken in an area of analytical chemistry. The project will be selected by the student and will have a pharmaceutical or clinical theme. A detailed research report must be submitted.

*General.* Emphasis is placed on technique and general methods. Students are expected to show initiative in organizing 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

As prescribed for Pharmaceutical Chemistry II (Practical)  
and

Williams, D H and Fleming, I, *Spectroscopic methods in organic chemistry*. 2nd ed London, McGraw-Hill, 1973.

NOTE The balance of the refundable deposit from first and second years will be retained in third year to cover the cost of replacing damaged or cleaning dirty apparatus. Any student who has had excessive breakages in previous years, which have been deducted from the deposit, may be required to lodge a further deposit.

## PHARMACOLOGY II

A course of 75 lectures and 100 hours' practical work.

*The endocrine system.* The synthesis, storage and release of hormones; abnormalities in hormonal secretions. Hypothalamic releasing factors and feedback control. Neurosecretion. Hormonal inter-relationships in the control of water balance, blood levels of glucose and calcium, metabolic rate, growth and lactation. Synthetic hormones. Corticosteroids; hypoglycaemic and antithyroid drugs.

*The physiology and pharmacology of the central nervous system.* Anatomy of human brain, spinal and cranial nerves. Circulation of the cerebro-spinal fluid. Cranial blood supply. Somatic and autonomic reflex arcs. Learning and memory in the somatic and autonomic nervous systems. Long and short term memory. Location of sensory, motor and association areas. Sensory pathways with particular reference to pain. Headache. The pyramidal and extrapyramidal systems. Disorders of locomotion. Centrally acting muscle relaxants. The aetiology and therapy of Huntington's chorea and Parkinson's disease. Inter-relationships between autonomic and somatic nervous systems. The role of the hypothalamus and limbic system in emotion and behaviour and the regulation of temperature, food and water intake. Vomiting, emetics and anti-emetics. Medullary control and respiration and coughing. Respiratory stimulants and anti-tussives. The EEG. Reticular formation, wakefulness, EEG arousal and recruiting responses. Sleep. Hypnotics, anaesthetics and sedatives. Epilepsy and its treatment. Drug therapy of psychiatric disorders; tranquillizers, antidepressants, psychomotor stimulants. Hallucinogens. Narcotic and non-narcotic analgesics, addiction, tolerance and dependence. Anorectics.

*Clinical pharmacology.* A therapeutic approach to disease states involving the following systems: eye, uterus, connective tissue, skin, respiratory and gastrointestinal tracts.

*Biochemical Pharmacology.* Molecular biology. Genetic function of DNA; DNA replication; genetic code; template RNA; transcription of code; activation of amino acids; ribosomes; translation of code; polypeptide formation; inhibition of protein synthesis. Cellular regulatory mechanisms. Allosteric control; induction and repression; compartmentation; hormones. Drug metabolism. Types and sites of biotransformation; induction of liver microsomal drug-metabolizing enzymes; conjugation. Drugs acting on cell division. Chemotherapy of cancer, carcinogens.

*Parasitic disease and its treatment.* The life histories of various parasites and the methods used for their eradication with particular reference to chemotherapy.

*Development of new drugs.* Preclinical and clinical evaluation of drugs, governmental regulatory bodies.

*Drug toxicity.* Toxicity testing, iatrogenic disease, drug interactions, environmental pharmacology, treatment of toxicity.

### **Practical**

*In vivo* and *in vitro* experiments to illustrate the principles discussed in the lecture course.

### **Textbooks and references**

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

Bacq, Z M, *Fundamentals of biochemical pharmacology.* Oxford, Pergamon, 1971.

Bhagan, N V, *Biochemistry. A comprehensive review.* 2nd ed, Philadelphia, Lippincott, 1978.

Catt, K J, *An ABC of endocrinology.* Boston, Little, Brown & Co, 1972.

*Pharmacology II Laboratory Manual.* Melbourne, Victorian College of Pharmacy Ltd, 1981.

Pratt, W B and Ruddon, R W, *The anti-cancer drugs.* Oxford, Oxford University Press, 1979.

## **FORENSIC PHARMACY**

A course of 25 lectures.

Introductory lectures on:

- (a) The history of our governmental system including the legislative, administrative and judicial bodies
- (b) Our laws and their origin
- (c) Statutory interpretation.

The aim of the course is to develop a sense of legal and professional responsibility.

The subject deals with the legislation that is applicable to drugs, medicines (drugs in compound form), poisons, and pharmacy generally. A knowledge of the following in so far as they relate to pharmacy:

Pharmacists Act and Regulations.  
Poisons Act and the Regulations.

The Health Act and Regulations including Food and Drug Standards Regulations and Cleanliness (Food, Drugs and Substances) Regulations  
National Health Act and Regulations  
Therapeutic Goods Act  
Weights and Measures Act  
Stock Medicines Act  
Commonwealth Spirits Act and Regulations  
Labour and Industry Act  
Postal Regulations  
Code of good manufacturing practice  
The course will also consider standards of professional conduct, inter-professional relations, organisation of health services in Victoria and pharmacy organizations in Victoria.

**Textbooks**

Poisons Act 1962  
Pharmacists Act 1974  
Poisons, Drugs of Addiction and Restricted Substances, and Pharmacists Regulations  
Schedules to Poisons Act  
Office Consolidation.

**PHARMACEUTICAL ADMINISTRATION AND ORGANIZATION**

A course of 50 lectures.

**Accounting**

Basic accounting terminology. The fundamental accounting equation. A modified system of accounting typically used by a professional enterprise.

A consideration of the nature of financial analysis; approaches to the analysis of financial statements; methods of financial analysis; funds statements and their interpretation, and the computation and interpretation of strategic ratios from financial statements.

A study of managerial control of a pharmacy through accounting systems including fixed and variable cost analysis, break-even analysis, application of fixed and variable costs to budgets, cash budgeting, profit forecasting and planning.

An introduction to the subject of partnerships.

## Commercial Law

*Contract.* Formation and contents of contract; misrepresentations; rights and liabilities; termination of contracts.

*Sale of goods.* Definitions; requirements for enforceability; implied warranties and conditions; carriage of goods; rights and obligations of parties in relation to delivery; acceptance etc.

*Cheques.* Use, type and crossing of cheques; negotiability; essential elements of form; liability of parties; effect of forgery and unauthorised endorsement.

*Insurance.* Types of insurance; concept of good faith; indemnity contracts; insurable interest; cover-notes; subrogation.

*Restraints of trade, consumer protection.* Employer-employee; vendor-purchaser restraints; effect of Commonwealth Trade Practices Act; Victorian Consumer Affairs Act.

*Negligence and workers compensation.* Duty of care; breach of duty; damage; seller's negligence; negligent statements; employee protection generally; workers compensation; definition of 'worker'; scope of entitlement; benefits available.

## Management

*Human behaviour.* The individual; groups; motivation; the client, customer relations, communications.

*Partnerships.* Practical and legal aspects of partnerships.

*Marketing.* Consumer needs; principles of marketing; principles applied to pharmacy.

*Pricing.* Pricing of prescriptions.

*Pharmacy and the nation.* Productivity of health professions; characteristics of pharmacy workforce; pharmacy manpower planning.

## Graduate School

The Graduate School of the Victorian College of Pharmacy was founded in 1970 to develop and direct all graduate studies within the College. Through the Intersearch Executive faculty it controls all local aspects of the Intersearch Programme which is a joint venture in graduate studies operated by the Victorian College of Pharmacy and the University of Kansas, USA (see page 13).

Students of high academic merit are enrolled in the Intersearch programme to proceed to the degree of Doctor of Philosophy; the degree is jointly awarded by the two institutions. Candidates must complete studies on both campuses in order to participate in the programme which involves formal course work and research. The programme was founded through an initial grant from Mr Lumsford Richardson and has since been financed through the Drug Research Appeal of the Victorian College of Pharmacy and the Endowment Association of the University of Kansas.

The Graduate School also controls and directs all aspects of the Master of Pharmacy programme. The graduate faculty consists of those members of staff who hold the degree of Doctor of Philosophy, are of lectorial status and above, and who wish to be involved in the research activities of the College. There are also external members of the Graduate School who act as advisors and who have been interested in various graduate developments within the College. External members are from other academic institutions, research foundations, and the pharmaceutical industry from within Australia, the United Kingdom and the United States of America.

### *Dean, Graduate School*

Colin Raper

### *Executive Committee, Graduate School*

Colin Raper (Chairman)

Peter R Andrews

Ian H Pitman

Geoffrey N Vaughan

President-in-office, Victorian College of Pharmacy Ltd

Robert Burnet (Secretary)

### *Executive Committee, Intersearch*

Takeru Higuchi (President), University of Kansas

Peter R Andrews, Victorian College of Pharmacy Ltd

John A Hersey, Victorian College of Pharmacy Ltd

Lester A Mitscher, University of Kansas

Howard E Mossberg (Secretary, USA) University of Kansas

Ian H Pitman, Victorian College of Pharmacy Ltd

Colin Raper, Victorian College of Pharmacy Ltd

Charles O Rutledge, University of Kansas

Valentino Stella, University of Kansas

Geoffrey N Vaughan (Secretary, Australia), Victorian College of Pharmacy Ltd.

## Research

Research facilities are available within the Graduate School for students to undertake graduate work in experimental and theoretical areas of



the pharmaceutical sciences. Students may enter for the M Pharm, PhD (Intersearch), D Pharm (Pharmaceutical Society of Victoria) degrees by arrangement with the Graduate School. The following fields of research are available for graduate studies:

#### *Pharmaceutics*

- Pharmaceutical Sciences
- Pharmaceutical Formulation
- Biopharmaceutics
- Pharmaceutical Technology
- Physical Pharmacy
- Pharmacokinetics
- Microbiology

#### *Pharmaceutical Chemistry*

Analytical chemistry of dosage forms and biological systems, applications of instrumentation in pharmaceutical science, drug design and synthesis, natural product chemistry. Clinical chemistry to support drug research in hospital practice, plus chemical support for industrial and community practice.

#### *Pharmacology*

Pharmacological studies of cholinergic and adrenergic systems, coronary physiology, reproductive physiology, biochemistry.

#### *Regulations*

The rules and regulations for the award of the above degrees are detailed on page 65 of the handbook.

### **Graduate Diploma in Hospital Pharmacy**

The Victorian College of Pharmacy Ltd commenced teaching a graduate diploma in hospital pharmacy in 1978. Any pharmacist with hospital experience is eligible to apply for admission to the course. Applications close on 24 December 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 course is planned around three major areas: clinical pharmacology, clinical pharmaceutics and applied or hospital pharmacy practice. Wherever possible the lectures on clinical pharmacology are designed to interface with clinical pharmaceutics to show the relevance of pharmaceutical aspects such as doseform design, dosage regimen and medicine selection. The section on hospital pharmacy practice will introduce the student to pertinent subjects such as drug distribution, unit dose packing, IV additives, radiopharmaceuticals, drug monitoring and quality control. It will also extend to other fields including patient counselling, microbial contamination and clinical trials.

Generally, lectures will be held in the mornings at the College Pharmacy. Didactic formal contact over the two academic years is about 165 hours,

approximately broken down as follows:

Clinical Pharmacology	108 hours
Clinical Pharmaceutics	37 hours
Applied Hospital Pharmacy Practice	20 hours

In addition, formal course work on data processing, application of computers, information retrieval and relevant biostatistics will be presented. This will account for another 15 hours of formal lecture time.

Afternoons are generally reserved for assignment topics. These will be tutorials, discussion groups, clinical sit-ins, student-presented seminars, ward rounds, hospital/work visits, visits to biochemical, haematology and pathology laboratories, laboratory exercises and demonstrations. These will account for another 250 hours formal contact time over the two years.

Great importance is placed on the active participation of each of the students in seminar presentation and discussion groups. The students' performances at these seminars and tutorials will be closely monitored; marks will then be allocated on degree of participation in discussions, 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 4-6 hours per week on personal private study. This will involve library and literature assignments, preparation of patient's 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.

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 lectures.

*Advanced pharmacology.* This will consist of revision and an updating 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.

*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, tissue and organ growth, wounds, neoplastic and immunologically-based diseases and poisoning are also covered.

*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 (possibly 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.

Avery, G S, *Drug treatment*, 2nd ed Sydney, Adis, 1980.

Bowman, W C and Rand, M J, *Textbook of pharmacology*, 2nd ed Oxford, Blackwell, 1980.

Harrison, R T, *Principles of internal medicine*, 9th ed New York, McGraw-Hill, 1980.

Koda-Kimble, M A, Katcher, B S and Young, L Y, *Applied therapeutics for clinical pharmacists*, 2nd ed San Francisco, Applied Therapeutics Inc., 1978.

McClintic, J R, *Physiology of the human body*, 2nd ed New York, Wiley, 1978.

### CLINICAL PHARMACEUTICS

A course of 37 lectures.

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, multidose 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.

### Textbooks

Gibaldi, M, *Biopharmaceutics and clinical pharmacokinetics*, 2nd ed Philadelphia, Lea and Febiger, 1977.

Niazi, S, *Textbook of biopharmaceutics and pharmacokinetics*, New York, Appleton Century Crofts, 1974.

Ritschel, W A, *Handbook of basic pharmacokinetics*, Hamilton, Drug Intelligence Publications Inc, 1976.

### APPLIED HOSPITAL PHARMACY

A course of 20 lectures.

*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.

*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 medicated records, patient compliance, drug distribution systems, unit packs and relevant packaging technology, ward and ward stock control, drug information services, intravenous additives, parenteral alimentation, and radiopharmaceuticals will be offered, possibly as electives.

All enquiries related to the Graduate Diploma should be addressed to the Course Director.

## Sponsorships

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:

### **Sigma Industrial Professorship**

Sigma Co Ltd has supported an Industrial Professorship in Pharmaceuticals since 1971. The foundation and present incumbent of this chair is Professor John A Hersey.

### **Nicholas Industrial Professorship**

Nicholas International Ltd is supporting an M A Nicholas Industrial Professor in Biopharmaceutics for an initial period of five years from 1978. Professor Barry L Reed is the foundation professor of biopharmaceutics.

### **Sigma Research Fellowship**

Sigma Co Ltd is currently supporting a research assistant in the School of Pharmacology.

*Recipients:*

- 1979 Ong, Suan Beng
- 1980 Carlo Maccarone

### **Nicholas Research Fellowship**

Nicholas International Ltd is currently supporting two graduate research students undertaking the Master of Pharmacy degree.

*Recipients:*

- 1979 Christopher J Farquhar
- 1980 Christopher J Farquhar
- Luigi Pierri

### **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:*

- 1979 Barrie C Finnin
- 1980 Barrie C Finnin

### Pharmaceutical Society Research Fellows

The College conducts an ongoing Drug Research Appeal which has been generously supported by many private and organisational donors, both within and outside the profession. The following fellowships are being provided from the Drug Research Appeal Fund.

*Recipients:*

- 1979 Koay Bee Bee  
Jean Kozak  
Lee Man Kok  
Dorothy J Snell
- 1980 Koay Bee Bee  
Lee Man Kok  
Leung Edward  
Nigel Paulet

### Cyril Tonkin Scholarship

The Pharmaceutical Society of Victoria has awarded Cyril Tonkin Scholarships to four graduate research students, one of whom is undertaking an Intersearch Doctor of Philosophy degree, and three of whom are undertaking a Master of Pharmacy degree.

*Recipients:*

- 1979 Kwok Yui Hunt  
Lai Kei Yin  
Lisette J Wolf
- 1980 Chow Weng Lok  
Lai Kei Yin  
Janet Ramsay  
Desmond J Williams

### Perkin-Elmer Research Fellowship

Perkin-Elmer Pty Ltd is currently supporting a graduate research student undertaking a Master of Pharmacy degree.

*Recipients:*

- 1979 C Geoffrey Beamiss
- 1980 C Geoffrey Beamiss  
Toh Tiong Cjeng

### David Bull Laboratories Research Fellowship

David Bull Laboratories is currently supporting a research student undertaking a Master of Pharmacy degree.

*Recipient:*

- 1980 Wong Siong Chiik

# Exhibitions

Subject		Value	Qualification	Donor or Style
First Year	Pharmaceutics I	\$100	best student	Sigma Co Ltd
	Pharmaceutical Chemistry I	\$100	best student	Sigma Co Ltd
	Mathematics	\$100	best student	Salaried Pharmaceutical Chemists' Association
	Physiology	\$50	best student	Ramsay Surgical Ltd
Second Year	Pharmaceutics II	\$100	best student	Bequest late H T Tompsitt
	Pharmaceutical Chemistry II	\$100	best student	Bequest late H T Tompsitt
	Pharmacology I	\$100	best student	Sigma Co Ltd
Third Year	Pharmaceutics III	\$100	best student	Bequest late H T Tompsitt
	Pharmaceutical Chemistry III	\$100	best student	Bequest late H T Tompsitt
	Pharmacology II	\$100	best student	Sigma Co Ltd
	Forensic Pharmacy	\$50	best student	Kodak (A/asia) Pty Ltd
	Pharmaceutical Administration and Organisation	\$50	best student	Kodak (A/asia) Pty Ltd

## Special Awards

Style	Value	Qualification	Donor
Pharmacy Gold Medal	—	best student at Pharmacy III Examination	Pharmaceutical Society of Victoria
Francis Hardey Faulding Exhibition	\$50	best male student at Pharmacy III Examination	F H Faulding & Co Ltd
Freda Smalley Exhibition	\$50	best female student at Pharmacy III Examination	Women Pharmaceutical Chemists' Association of Victoria
Byron Stanton Exhibition	\$50	best student in the biological sciences	Victorian Pharmacy Students Association
Guild Exhibition	\$100	best student in the physical sciences	The Guild Insurance Co Ltd
Chapter Prize	—	best trainee project	Chapter of Pharmacy Practice Tutors
Scott-McGibbony Prize	—	best student/trainee in management	Pharmacy Guild of Australia (Victorian Branch)
P D L Exhibitions	3 x \$100	best three students at Final Qualifying Examination in Practical Pharmaceutics	Pharmaceutical Defence Ltd



# College rules

(Issued by the Council)

## Classes

- 1 Students are required to familiarise themselves with the time-tables 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 lecture theatres, laboratories, or the assembly hall, where facilities are not provided. (When smoking in the library please use the ash-trays provided).
- 6 No chemicals, 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 term at the College while fees for the previous term are unpaid, unless a satisfactory reason is given to the Registrar.
- 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 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 completely 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.
- 20 Where a student has been guilty of any misconduct or breach of these rules, he 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.

## **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 college of advanced education 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 wish to seek advice or 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 (Registrar)

Louis Roller (School of Pharmaceutics)

## **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 on 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 designed primarily for the use of members of the Pharmaceutical Society of Victoria. The free use of the library has been extended by the Society to outside professional and academic institutions, private corporations and the academic staff of the college.

Council has directed that the administration of the library be attached to the Dean's office. A student representative sits on the library committee.

Students are more than welcome to use the library which is available to them for study and reference purposes. However, they are requested to consider the rights of the other users of the library facilities and to conform to the rules. The basic hours of opening are from 9.00 am to 5.00 pm from Monday to Friday.

### **Library Rules**

- 1 The library is available for study and reference purposes.
- 2 'Sub-total' silence is requested in the library at all times, at the discretion of the Dean or his staff who may be in charge at the time.
- 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 permitted in the western end of the library if ash trays are used.
- 9 Users failing to observe the current rules may be suspended from using the library.

# Pharmacy Board of Victoria (Constituted 1876)

M G Blachford, PhC, MPS *President*

P Moore, PhC, MPS *Treasurer*

R W Ashton, PhC, MPS

W J Baneth, BPharm, PhC, MPS

J R Coppock, PhC, MPS

M Gandolfo, PhC, MPS

W A Mercer, PhC, MPS, LHA

N W Naismith, PhC, MPS, FSHP

I H Pitman, BSc, PhD, PhC, MPS, FRACI

J C Urquhart, PhC, FPS

H V Feehan, BCom(Hons), AFAIM, AIBA, MRSH *Registrar*

S N Leyshon, BEc, AUA(Pharm), DipEd, MPS, AASA, AAIM *Deputy Registrar*

## Functions of Board and Society

The Pharmacy Board of Victoria is a quasi-legal body constituted by statute and answerable to the Victorian State Parliament through the Minister of Health. The Board meets and has its administrative offices in the Victorian College of Pharmacy.

The Board, in effect, 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, and supervises the practical training of students, including the registration of articles of traineeship, approval of preceptors and the issuing of student's 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 Victoria.

The Pharmaceutical Society of Victoria 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 interests of the pharmacists who are its members. For nearly a century the Pharmaceutical Society of Victoria owned and operated a College which taught students of pharmacy in a school recognised by the Pharmacy Board.

In 1976 the Council of the Pharmaceutical Society of Victoria determined to establish a new and separate Council to administer the affairs of the College. The new Council assumed its responsibilities from January 1, 1977.

# Examinations

The Board's examinations are conducted in the College. A great amount of co-operation exists between the Board and the Society. The Pharmacists Act 1974 provides that the Pharmacy Board of Victoria shall have power to control and direct examinations concerned with the pharmacy course.

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. The Final Examination is conducted at the conclusion of the period of practical training.

## 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
- Physiology

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

- Pharmaceutics II
- Pharmaceutical Chemistry II
- Microbiology
- Pharmacology I
- Biochemistry

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

- Pharmaceutics III
- Pharmaceutical Chemistry III
- Pharmacology II
- Pharmaceutical Administration and Organization
- Forensic Pharmacy

The Final Examination shall consist of examinations in the following:

- Dispensing (practical)
- Pharmaceutical Practice (oral)

## 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.

### Final Examination

The syllabus is as follows:

#### 1. *Dispensing (Practical)*

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

The candidate will be required to exhibit a well developed skill in the preparation and presentation of pharmaceutical products often extemporaneously prepared and in the dispensing of prescriptions. Appreciation and resolution of contemporary problems in modern medication is also expected. The candidate is also required to write a concise but accurate and intelligible record of all relevant quantitative and qualitative information as to his bench operations. Facility 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.

#### 2. *Pharmaceutical Practice (oral)*

This takes the form of an interview with a member or members of the Pharmacy Board. The candidate will be required to quickly establish a formal and co-operative relationship with his interviewer and to intelligibly discuss the State and Federal laws relating to the practice of pharmacy in Victoria, to read prescriptions and discuss medication problems.

The interviewer will require evidence that the candidate has been able to learn technical and forensic details of the kind of pharmaceutical practice he has been engaged in during his traineeship.

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

- (a) Pharmacists Act 1974
- (b) Pharmacists Regulations 1976
- (c) Poisons Act 1962
- (d) Drugs of Addiction and Restricted Substances Regulations
- (e) Poisons Regulations 1963
- (f) Part XIV of the Health Act and the relevant sections of the Regulations
- (g) Stock Medicines Act, Stock Foods Act, Pesticides Act and Regulations
- (h) National Health Act and Regulations

#### Closing date of entry

This will be advertised in the Australian Journal of Pharmacy, the Pharmaceutical Society's News Bulletin, the College calendar of dates and a personal communication will be sent to each trainee at his last known address.

# Examination rules

(Issued by the Pharmacy Board of Victoria)

The following examination rules are issued by the Pharmacy Board of Victoria and the Victorian College of Pharmacy Limited. These rules should be read in conjunction with Council's policy concerning courses of study published on page 14.

- 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 prior to the commencement of the examination but may not 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 Pharmacy Board of Victoria or the Victorian College of Pharmacy 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.
- 14 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.
- 15 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.
- 16 Any communication regarding examinations must be addressed in the initial instance to the Registrar of the Victorian College of Pharmacy.
- 17 In these rules 'examination' includes supplementary examinations and any additional examination, either written, oral or practical, prescribed by an individual examiner.



# Victorian College of Pharmacy Ltd

## Victoria Institute of Colleges

### REGULATIONS FOR THE AWARD OF BACHELOR DEGREES

#### Definitions

1 In these regulations:

“Affiliated College” means any institution which is an affiliated college within the meaning of the Victoria Institute of Colleges Act 1965,

“Bachelor Degree” means any bachelor degree which is specified from time to time in the Schedule of the Victoria Institute of Colleges Statute 8.1 – Degrees and Diplomas,

“Board” means the Board of Studies of the Victoria Institute of Colleges,

“College” means the affiliated college at which a candidate is enrolled or proposes to enrol in an approved course leading to a bachelor degree,

“Council” means the Council of the Victoria Institute of Colleges,

“Institute” means the Victoria Institute of Colleges,

“Registrar” means the Registrar of the Victoria Institute of Colleges.

#### Admission requirements

2 A candidate for a bachelor degree shall:

- (a) Qualify for admission to an affiliated college in a course of study whose curriculum and entrance requirements have been approved by the Council for the purposes of the award of that degree;
- (b) Complete all requirements relating to attendance at lectures and practical classes, assignments and examinations laid down by the college and as approved by the Council from time to time; provided that a candidate who has completed appropriate study at another institution may, at the discretion of a college, be admitted to a course leading to a bachelor degree in that college.

#### Reports on students admitted

3 Upon the request of the Registrar, an affiliated college shall furnish information on the qualifications of persons admitted to courses of study leading to the award of a bachelor degree.

#### Approval of Courses of Study

4 The Council may approve a course of study in an affiliated college leading to the award of a bachelor degree on such conditions and for such terms as, on the advice of the Board, it deems appropriate.

#### Periodic Reviews

5 The Board shall make such arrangements as it deems appropriate for the periodic review of standards of achievement of students completing approved courses leading to bachelor degrees and shall report to the Council on its findings. In the light of such reports, the Council may withdraw approval of a course of study or confirm such approval either conditionally or unconditionally.

### **Examination of Candidates**

6 An affiliated college granted approval to conduct a course leading to the award of a bachelor degree shall be responsible for the examination of students enrolled in such course, provided that the Board at its discretion, may require a college to appoint an examiner or examiners acceptable to the Board and external to the college staff to report on the standards achieved by candidates completing the final year of an approved degree course.

### **Fees**

7 Notwithstanding any fees levied by the college, a candidate shall pay such fees as may be determined from time to time by the Council.

### **Eligibility for Degree**

8 A candidate who has satisfied the requirements of Regulations 2 and 6 shall be qualified to be admitted to the relevant bachelor degree and upon applying to the Registrar in writing shall be entitled to have the degree conferred upon him.

### **Principals to Certify**

9 At least thirty days before the date fixed for a ceremony at which bachelor degrees will be conferred by the Council the Principal of an affiliated college at which a candidate has completed an approved course of study and fulfilled all other requirements for the award of a degree shall forward to the Registrar a list of the names of the persons who have qualified for a bachelor degree together with a signed certificate that all of the candidates named have fulfilled all of the conditions for the degree laid down in these regulations.

### **Conferring the Degree**

10 Such certified candidates shall have the degree conferred upon them by the President of the Institute or his representative according to procedure determined by the President.

### **Degree without Examination**

11 On the recommendation of the Board, the Council may admit to a bachelor degree without examination, or with such special examinations as may be prescribed by the Board, any person who has completed or has carried out such formal academic study, research, investigation or developmental work or has achieved such eminence in a relevant profession as, despite his noncompliance with the requirements of Regulation 2, in the opinion of the Board warrants his admission to the degree.

### **Register**

12 The Registrar shall keep registers of names of all graduates on whom bachelor degrees are conferred and the dates of such conferment.

### **College Rules to Apply**

13 Except as specifically provided in these regulations, the rules for enrolment of students in the college, as published in the then current

handbook of the college, shall apply to students of the college enrolling to undertake an approved course of study for a bachelor degree.

The Victoria Institute of Colleges is currently considering additional regulations for the award of the degree Bachelor of Pharmacy. These additional regulations will be made known immediately they are available.

## REGULATIONS FOR THE AWARD OF DEGREE OF MASTER BY THESIS OR PUBLICATION

- Definitions**      1    In these regulations
- Affiliated College* means any institution which is an affiliated college within the meaning of the Victoria Institute of Colleges Act,
- Board* means the Board of Studies of the Victoria Institute of Colleges,
- College* means the affiliated college in which a person is, with the approval of the Board, undertaking a research program or other requirement of the Board in respect of a candidature, or the affiliated college in which an applicant proposes to enrol for such purpose,
- Council* means the Council of the Victoria Institute of Colleges,
- Institute* means the Victoria Institute of Colleges,
- Degree of Master by Thesis or Publication* means a degree of master specified in the schedule to the Victoria Institute of Colleges Statute 8.1 – Degrees and Diplomas, and
- Registrar* means the Registrar of the Victoria Institute of Colleges or any other person appointed by the Council to act as Registrar for the time being.
- Candidature**      2    The Board may admit persons to candidature for a degree of master by thesis or publication and any person so admitted may proceed to undertake the research program or other requirement prescribed by the Board, in respect of his candidature.
- Admission to Candidature**      3    3.1    A person may be admitted to candidature for a degree of Master by Thesis pursuant to Regulation 4.1 or 4.2, who is recommended for admission to candidature by the College in which he proposes to undertake his research program and who satisfies the Board that he
- Thesis**                              3.1.1    has qualified for a first degree of the Institute (or such other degree as the Board may deem equivalent for this purpose)
- 3    3.1    3.1.1    at a standard considered by the Board to be sufficiently meritorious;

- 3.1.2 or has qualified for any other award judged by the Board to be of relevant character and appropriate standard; and has produced evidence of professional experience through which he has developed his applied knowledge of the relevant field of study, such as satisfies the Board that he has the capacity to undertake study for the degree of master;
- 3.1.3 and has fulfilled any other conditions relating to pre-requisite study which the Board may have imposed in respect of his admission to candidature.

**Publication**

- 3.2 A person may be admitted by the Board, to candidature for a degree of Master, by publication who
  - 3.2.1 has held for a minimum period of five years
    - 3.2.1.1 a first degree of the Institute or of an Australian university, or of any other institution approved by the Board for this purpose; or
    - 3.2.1.2 such other qualifications as might be approved by the Board in individual instances,
 

provided that an applicant who is not resident in Victoria may be admitted to candidature only if he has gained a tertiary qualification from a Victorian institution; and
  - 3.2.2 submits to the Board a publication or publications based on original research, investigation or developmental work carried out by him in an industrial, commercial, governmental, educational or research organisation, approved by the Board for the purpose, or carried out as a member of the staff of an Affiliated College; provided that the subject and nature of the research work are accepted by the Board as appropriate for examination for the award of the degree of Master.

**Types of Programs**

- 4 The following types of research programs may be approved by the Board as appropriate for candidates to undertake for qualifications for the award by degree of Master by Thesis:

<b>College-based Research Programs</b>	4.1	presentation of a major thesis based on original research, investigation or developmental work, carried out under supervision in an Affiliated College by a candidate enrolled as a student of the College (hereafter referred to as a College-based research program);
<b>Non-College-based Research Program</b>	4.2	presentation of a major thesis based on original research, investigation or developmental work, carried out by a candidate enrolled as a student of an Affiliated College in an approved industrial, commercial, governmental, educational or research organisation under the supervision of not less than two supervisors, of whom one is a full-time member of the staff of the College and appointed by the College (hereafter referred to as a non-College-based research program).
<b>Research Program Requirements</b>	5	<p>5.1 A candidate proceeding to a program of research pursuant to Regulation 4.1 or 4.2 shall be required to undertake, during the first year of his candidature, a structured course of study approved by the Board, designed to advance his knowledge of certain specialised disciplines and to acquaint him with the methodology of research, unless it can be shown that the candidate has previously completed a post-graduate program, which has fulfilled this purpose; or had experience deemed by the Board to be equivalent.</p> <p>5.2 An application for candidature pursuant to Regulation 4.1 or 4.2 shall be submitted to the Board on the applicant's behalf by the Principal of the College and shall be in a form prescribed by the Board.</p> <p>5.3 The Board shall determine whether an applicant shall be admitted to candidature. In arriving at such determination, the Board shall take into account, amongst other things, the facilities available for the student to undertake the program of research, and the subject and nature of the applicant's proposed research program.</p>
<b>Duration</b>	6	<p>6.1 The Board shall not certify as to the successful completion of a research program undertaken by a candidate until the elapsed period from the date of approval of the candidature is:</p> <p>6.1.1 in respect of a candidature who is admitted to candidature pursuant to Regulation 3.1.1, two years full-time equivalent; and</p>

- 6.1.2 in respect of a candidate who is admitted to candidature pursuant to Regulation 3.1.2, such minimum period as the Board may in any instance determine.
  - 6.2 In regard to any stipulated period of full-time research or work the Board may determine, in respect of a candidate, the equivalent period to be spent in part-time research or in varying segments of full-time or part-time research.
- Criteria for Publications**
- 7 7.1 For the purpose of assessing an application pursuant to Regulation 3.2, the Board shall require that any publication submitted in respect of the application:
    - 7.1.1 has been the subject of critical independent examination prior to publication;
    - 7.1.2 is available to the general public;
    - 7.1.3 is accompanied by documentary evidence that the applicant is the author; and
    - 7.1.4 where it consists of several papers, relates to one aspect of the subject.
  - 7.2 A report issued by an organisation shall not, without the express consent of the Board, be accepted as a publication for the purpose of these regulations.
  - 7.3 Where a paper has been published jointly, the applicant shall provide the Board with a written statement indicating the extent of the applicant's personal contribution to the project reported in the publication and any co-author or any person who in respect of the publication had been a supervisor of the applicant's work shall provide the Board with such documentary evidence as the Board may direct on the extent of the applicant's contribution to the project and the authorship of the publication.
- Supervisors**
- 8 8.1 For a candidate undertaking a College-based research program, the college shall appoint at least one supervisor who shall be a member of the staff of the College and who shall supervise and assist the candidate. The appointment of supervisors shall be subject to the approval of the Board.
  - 8.2 For a candidate proceeding by non-College-based research program, the college shall appoint not less than two supervisors, of whom at least one shall be a member of staff of the College and of whom at least one shall be a person who is associated with the organisation in which the

candidate is to carry out his program. The appointment of the supervisors shall be subject to the approval of the Board.

- 8.3 In respect of any such candidate, the College shall submit to the Board, at the completion of the first year of the program, and after the results of any examination are known, a report of approximately three hundred words on the work of the candidate, prepared by each supervisor, together with:
- 8.3.1 the results of any examination of the candidate;
  - 8.3.2 details of any modifications made to the candidate's approved research program;
  - 8.3.3 suggested modifications for the candidate's research program; and
  - 8.3.4 a recommendation as to whether the candidature should be continued or terminated.

**Intermediate Examination**

- 9 9.1 A College may, on the recommendation of a supervisor, require a candidate to undertake such examination requirements related to the approved research program as his supervisor or supervisors may determine.
- 9.2 The College shall be responsible for the conduct of any intermediate examination pursuant to Regulation 9.1 above.

**Candidate's Progress**

- 10 The Board may, upon the recommendation of the College or at its own discretion, terminate the candidature of a candidate whom the Board considers not to be making satisfactory progress in his research program, presentation of thesis or any other requirement.

**Examinations**

- 11 11.1 11.1.1 In regard to candidates proceeding pursuant to Regulation 4.1 or 4.2, the College shall recommend, and the Board may approve, the appointment of not less than two examiners, neither being a candidate's supervisor,
- 11.1.2 Not more than one of any such examiners may be a member of the staff of the College or any other place in which any research for the thesis was carried out and no person may be appointed as an examiner who has been associated either directly or indirectly with the candidate's research program.
- 11.2 In regard to candidates admitted to candidature

pursuant to Regulation 3.2, the Board shall appoint at least two examiners to examine the publication or publications submitted by the candidate in respect of his candidature.

- 11.3 The Registrar shall notify examiners of their appointment by the Board.
- 11.4 The name of any examiner must not, without the approval of the Board, be disclosed to a candidate.
- 11.5 Each examiner shall report to the Board on the standard of the candidate's thesis or publications as the case may be, and recommend the decision which the Board should take in respect of the candidature.
- 11.6 If differing recommendations are received from examiners, and the Board is considering failing the candidate, a referee examiner shall be appointed by the Board to examine the candidate, to consider the other examiners' reports, and to recommend the action to be taken by the Board in respect of the candidature.
- 11.7 A candidate shall not submit for final examination more than twice on the one research program.

**Thesis or Publications**

- 12 12.1 A candidate shall, except as provided in Regulation 13, submit to the Board four bound copies of his thesis or publications, as the case may be. All copies of such thesis or publications shall conform with such specifications as are prescribed by the Board from time to time, and shall include a summary of approximately two hundred words and a certificate signed by the candidate to the effect that the work has not previously been submitted on behalf of the applicant, either in whole or in part, in respect of any other academic award.
- 12.2 Two copies of the thesis or publications shall become the property of the Institute and one further copy of the thesis shall become the property of the College.
- 12.3 If the research project has arisen in an organisation other than an Affiliated College, and the circumstances warrant the imposition of a measure of secrecy, the Board may direct that the thesis shall not become available for consultation for a period of time, which shall not be more than eighteen months from the date of such direction.



- 12.4 The Board may require a candidate to produce such evidence as it may direct to establish that any thesis or other publication may be published without infringing any agreement, patent, copyright, statutory obligation or contractual relationship.
- 12.5 The Council's policy on confidentiality, as published from time to time, shall apply in respect of any thesis, material, or other publication constituting a candidate's research program.
- 12.6 The Council shall be free to allow the thesis to be consulted or borrowed, and may signify a period of time after which it may issue the thesis or publications in whole or in part in photostat or microfilm or other copying medium, provided that the author has not in writing specifically withheld his consent to the thesis being made so available.

**Submissions  
in the Arts**

- 13 13.1 A candidate who is admitted to candidature in a field of the arts shall submit to the Board such compositions, designs, works of art, adjudicated performance, recordings or other forms of work as the Board shall deem appropriate in any case.
- 13.2 Where a thesis forms part or all of the submission by such candidate, such thesis may, to the extent approved by the Board, be in the form of photographs or other means of recording.
- 13.3 In connection with any submission to be made in a field of the arts, the Board shall advise the person seeking admission to candidature of any of its requirements in respect of ownership of any forms of work so submitted.
- 13.4 In all other respects the provisions of Paragraphs 12.3 to 12.6 inclusive of Regulation 12 shall apply in regard to any written thesis submitted in respect of a candidate in a field of the arts.

**Fees**

- 14 Notwithstanding any fees levied by the College, an applicant or candidate or graduand shall pay such examination, graduation and other fees as may be determined from time to time by the Council.

**Eligibility  
for Degree**

- 15 A candidate who has satisfied the requirements of these regulations shall, on the recommendation of the Board, and with the approval of the Council, be admitted to the appropriate Degree of Master and may apply in writing to the Registrar to have the Degree conferred upon him.

## REGULATIONS

- Conferring Degree** 16 The Degree shall be conferred by the President of the Institute (or his representative) according to procedure determined by the President.
- Degree without Examination** 17 On the recommendation of the Board, the Council may admit to a Degree of Master without examination, or with such special examinations as may be prescribed by the Board any person who, having graduated at any university or other tertiary institution, has completed such formal academic study, research or investigation or achieved such eminence in the relevant profession as may be deemed, in the opinion of the Board, to be equivalent of the requirements in Regulation 4.
- Register** 18 The Registrar shall keep a register of names of all graduates on whom a Degree of Master by Thesis or Publication is conferred and the date of such conferring.
- College Rules to Apply** 19 Except as specifically provided in these regulations, the rules for enrolment of students in a College, as determined by the College, shall apply to a candidate undertaking a research program leading to a Degree of Master by Thesis or Publication.
- Delegation** 20 There shall be a Standing Committee on Higher Degrees established by the Board.
- 21 The Council on the recommendations of the Board may delegate such responsibilities in respect of the implementation of these regulations as it deems fit to the Standing Committee on Higher Degrees, or College as appropriate.

Promulgated first day of January 1980 by direction of the Vice-President.

# Pharmaceutical Society of Victoria

## REGULATIONS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHARMACY

The Pharmaceutical Society of Victoria established in 1973 the degree of Doctor of Pharmacy (D Pharm) for its members. The D Pharm programme is funded wholly by the Society. The degree is of the "research" type and therefore is similar to the professional Pharm D degree, which is awarded widely throughout the United States.

The regulations concerning the award of the D Pharm degree together with the guidelines are recorded.

### Nature of degree

- 1 The Doctor of Pharmacy degree (D Pharm) is a research degree awarded by the Pharmaceutical Society of Victoria for the presentation of a thesis.<sup>1</sup>

### Admission to candidature

- 2 A candidate for the degree of Doctor of Pharmacy must:
  - (a) be a member of the Pharmaceutical Society of Victoria;
  - (b) hold a Master degree recognised for the purpose of this regulation by the Council;
  - (c) be accepted by the Council on the recommendation of the executive of the Graduate School of the Victorian College of Pharmacy Ltd.

### Course of Study

- 3 After being accepted a candidate must pursue a course of advanced study and research for at least two years.

### Examination

- 4 The Council, on the recommendation of the executive of the Graduate School, shall appoint not less than three examiners, one of whom may be the supervisor and at least two of whom will be external examiners.
- 5 The executive of the Graduate School may prescribe examinations as required additional to the examination of the thesis.

### Thesis

- 6 Four copies of the thesis will be presented. One copy of the thesis of each candidate fulfilling the requirements for admission to the degree shall be deposited in the library of the Society.

### Awarding body

- 7 In every instance Council will be the body which awards the degree on the recommendation of the examiners.
- 8 Council will direct that a roll of all D Pharm graduates be kept and that such roll be published in the annual report of the Society.

*A candidate may not present as his thesis any work for which any other degree has been conferred on him, but he will not be precluded from incorporating such work or any part thereof in his thesis provided*

*(i) he has stated his intention to do so in his application for candidature and*

*(ii) he indicates in his thesis the part of the work which has been so incorporated*

## GUIDELINES

These guidelines should be read in conjunction with the regulation for the Degree of Doctor of Pharmacy

### Examination

- 1 The Council, on the recommendation of the executive of the Graduate School, shall appoint not less than three examiners, one of whom may be the supervisor and at least two of whom shall be external examiners.
- 2 The dean of the appropriate school shall act as chairman of the panel but need not be one of the three examiners. If the head of the appropriate school is not an examiner he shall not have a vote.
- 3 Each examiner shall read the thesis and may require the candidate to answer *viva voce* or in writing any questions concerning the subject of the thesis.
- 4 Before making their formal return the examiners shall consult together or otherwise communicate with each other with regard to the thesis submitted.
- 5 The result of the examination shall be in accordance with the decision of a majority of the examiners.

### Thesis

- 6 Four bound typewritten or printed copies of the candidate's thesis shall be lodged with the Executive Director of the Society. The form of the typewritten or printed copies shall be in accordance with the following specifications:
  - (i) Thesis should be double-spaced typed on metric size A4 paper. Only one side of the paper should be normally typed on.
  - (ii) There should be a margin of 3 cm on the left-hand side of all pages.
  - (iii) Pages should be numbered consecutively and clearly; interpolated sheets should be marked distinctly [eg 52(a)] or as the case may require.
  - (iv) The title of the thesis, the degree for which it is submitted, the year of submission and the full name of the author should be shown on the title page.
  - (v) A summary of approximately 200 words should be included.
  - (vi) All references should be listed at the end of the thesis.
  - (vii) The spine of each bound copy must carry the name of the author, the title of the work (abbreviated if necessary), the year of submission and the inscription 'D Pharm'.
  - (viii) In his thesis the candidate should indicate the sources from which his information is derived, the extent to which he has availed himself of the work of others and, in general terms, the portions of his work which he claims as original. When a candidate submits work carried out in collaboration with another person, he should indicate his own share in the work.



*Recommended Price \$3.00*