FACULTY OF SCIENCE

1968 HANDBOOK

THE UNIVERSITY OF NEW SOUTH WALES

FACULTY OF SCIENCE

1968 HANDBOOK

FIFTY CENTS

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FOREWORD

During the next few years, a great influx of new students is expected in this and the other universities in Australia, and the Faculty of Science will be much involved with the new problems and opportunities which will accompany this growth. As members of this Faculty it is well to examine the roles and functions of its Schools and the part which you may play in its development.

The primary role of the Faculty is to provide a series of strongpoints in which the basic scientific disciplines, both physical and biological, can be conserved and developed, and from which should flow lucid explanation of what is known and challenging ideas on what might be. The teaching of science and the extension of its boundaries by research and scholarship are inseparably linked in a university and as students in this Faculty you may hope to be infected with an enthusiasm for new knowledge and an appetite for some participation in the widening of understanding.

The Faculty has another very important role in its participation in the training of those students who are members of the "science-based" faculties—Engineering, Applied Science and Medicine. You will rub shoulders with many whose interests are directed towards specific areas of application of science and whose different views can widen and enrich your own.

The range of knowledge for which your Faculty is primarily responsible is large and expanding, and while you will of necessity concentrate your studies in particular areas, the courses available to you allow of many combinations and are designed to provide you not only with some degree of specialized competence but an appreciation of the unity of scientific knowledge. You have a rich and exciting diversity of courses from which to choose and we hope that you will emerge as graduates flexible in approach and abundant in imagination.

B. J. RALPH
Dean

CALENDAR OF DATES FOR 1968

Term 1 ..... March 4 to May 18
Term 2 ..... June 3 to August 10
Term 3 ..... September 2 to November 2

JANUARY—

Monday 22	Last day for acceptance of applications to enrol by new students and students repeating first year.
Monday 29	Australia Day—Public Holiday.
Tuesday 30 to Saturday Feb. 10	Deferred examinations.

FEBRUARY—

Monday 19	Enrolment Week commences for new First Year students.
Monday 26	Enrolment Week commences for students re-enrolling.

MARCH—

Monday 4	First Term lectures commence.
Friday 15	Last day for enrolment of new students.
Friday 29	Last day for later year enrolments.

APRIL—

Friday 12 to Monday 15	Easter.
Thursday 25	Anzac Day—Public Holiday.

MAY—

Saturday 18	First Term ends.

JUNE—

Monday 3	Second Term commences.
Monday 10	Queen's Birthday—Public Holiday.
Friday 28	Last day for acceptance of applications for re-admission after exclusion under rules governing re-enrolment.

JULY—

Tuesday 2 ..... Foundation Day.

Friday 19 ..... Last day for acceptance of applications for examinations.

AUGUST—

Saturday 10 ..... Second Term ends.

SEPTEMBER—

Monday 2 ..... Third Term commences.

OCTOBER—

Monday 7 ..... Eight-Hour Day—Public Holiday.

NOVEMBER—

Saturday 2 ..... Third Term lectures cease.

Saturday 9 to Saturday 30 ..... Annual Examinations (30-week courses).

1969

Term 1 ..... March 3 to May 17

Term 2 ..... June 2 to August 9

Term 3 ..... September 1 to November 1

JANUARY—

Tuesday 28 to Saturday Feb. 8 .... Deferred examinations.

FEBRUARY—

Monday 17 ..... Enrolment Week commences for new First Year students.

Monday 24 ..... Enrolment Week commences for students re-enrolling.

MARCH—

Monday 3 ..... First Term lectures commence.

FACULTY OF SCIENCE

SCHOOL AND ADMINISTRATIVE OFFICERS 1968

Dean—Professor B. J. F. Ralph.

Deputy Dean—Associate Professor N. C. Stephenson, MSc *Syd.*, PhD *N.S.W.*, ARACI

Graduate Assistant to the Dean—Miss E. Ayre, BA *Syd.*

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Associate Professor (Clinical Psychology)
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Executive Assistant to Head of School
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Professor of Microbiology
J. M. Vincent, DScAgr *Syd.*, DipBact *Lond.*, FAIAS

Professor of Zoology
G. B. Sharman, BSc *Tas.*, DSc *W.Aust.*

SCHOOL OF CHEMISTRY

Professor of Inorganic Chemistry and Head of School
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Professor of Organic Chemistry and Deputy Head of School
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Personal Professor (Organic Chemistry)
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Head, Analytical Chemistry
N. R. Davies, BSc PhD *Lond.*, FRIC

Associate Professor and Head, Applied Organic Chemistry
E. R. Cole, MSc *Syd.*, PhD *N.S.W.*, FRACI

Associate Professor and Head, Inorganic Chemistry
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SCHOOL OF MATHEMATICS

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Professor of Applied Mathematics
V. T. Buchwald, BSc *Manc.*, MSc PhD *Lond.*

Professor of Applied Mathematics
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Professor of Pure Mathematics
G. Szekeres, DiplChemEng *Bud.*, FAA

Professor of Pure Mathematics
G. M. Kelly, BSc *Syd.*, BA PhD *Cantab.*

Associate Professor of Mathematical Statistics
J. B. Douglas, MA BSc DipEd *Melb.*

Director of First Year Studies
Associate Professor A. H. Low, MSc DipEd *Syd.*, PhD *N.S.W.*

SCHOOL OF PHYSICS

Professor of Applied Physics and Head of School
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Executive Assistant to Head of School
R. E. Lishmund, BSc PhD *St. And.*, AInstP, AAIP

GENERAL INFORMATION

ADMISSIONS OFFICE

The Admissions Office provides intending students (both local and overseas) with information regarding courses, admission requirements, scholarships and enrolment.

Applications for special admission or admission with advanced standing to courses should be made at the Admissions Office. Local residents should apply prior to 31st December of the year preceding that in which admission is sought. Where applicable documentary evidence should be tendered with the application, and copies should accompany original documents, as this will allow the immediate return of the latter. Students applying from overseas for admission to undergraduate courses and to those post-graduate courses which require completion of formal lecture courses should lodge their applications prior to 1st October of the year preceding that in which admission is sought.

Applications for admission to undergraduate courses from students who do not satisfy the requirements for admission (see section on "Requirements for Admission"), from students seeking admission with advanced standing, and from students who have had a record of failure at another university, are referred by the Admissions Office to the Admissions Committee of the Professorial Board.

Students seeking to register as higher degree candidates should discuss their proposals initially with the Head of the School in which they wish to register. An application is then lodged on a standard form and the Admissions Office, after obtaining a recommendation from the Head of the School, refers the application to the appropriate Faculty or Board of Studies Higher Degree Committee.

The Admissions Office also receives applications from students who wish to transfer from one course to another, or seek any concession in relation to a course in which they are enrolled. These applications should, wherever possible, be lodged before the commencement of the academic year in which the concession is to apply.

Students wishing to resume their studies after an absence of twelve months or more are required to apply to the Admissions Office for permission to re-enrol. It should be noted that, unless permission has been given to defer their studies for a specified period which will not normally exceed twelve months, students will be required to re-enter the course under the regulations prevailing at the time of resumption. This condition will apply also to students who have been re-admitted to a course after exclusion under the rules restricting students re-enrolling.

The Admissions Office operates an Enrolment Bureau for undergraduate students enrolling in the University for the first time. Details of the procedure to be followed by such students will be published in the preamble to the Higher School Certificate Examination results, or may be obtained on application to the Admissions Office.

The Admissions Office is located on the upper campus in the Chancellery, telephone 663-0351. Office hours are from 9 a.m. to 1 p.m., and 1.45 p.m. to 5 p.m., Monday to Friday. An evening service is provided during the enrolment period.

REQUIREMENTS FOR ADMISSION

Candidates may qualify for entry to undergraduate courses by complying with the matriculation requirements set out in Section A below, or by meeting the relevant requirements specified in Section B, or, for 1968 only, by complying with the special requirements set out in Section C.

SECTION A

MATRICULATION REQUIREMENTS

(To operate from 1st January, 1968)

The following are the revised matriculation requirements of the University of New South Wales consequent upon the introduction of the Higher School Certificate examination which will be held for the first time in 1967.

1. (a) A candidate for any first degree of the University must satisfy the conditions for admission set out hereunder before entering upon the prescribed course for a degree. Compliance with these conditions does not in itself entitle a student to enter upon a course.

(b) A candidate who has satisfactorily met the conditions for admission and has been accepted by the University shall be classed as a "matriculated student" of the University after enrolment.

(c) A person who has satisfactorily met the conditions for admission may be provided with a statement to that effect on the payment of the prescribed matriculation fee.

2. Except as elsewhere provided a candidate before being admitted to matriculation shall have passed at the required standard the Higher School Certificate Examination in New South Wales in at least five subjects in accordance with the following conditions:

(a) The subjects shall be chosen from the following subjects taken at the first, second or third level, in the Higher School Certificate Examination:

A. English.

B. (i) French, German, Greek, Latin.

(ii) Ancient History, Art, Economics, Geography, Modern History, Music, Bahasa Indonesia, Chinese, Dutch, Hebrew, Italian, Japanese, Russian, Spanish or such other language as may, in the case of any particular candidate, be approved by the Professorial Board.

C. (i) Mathematics.

(ii) Agriculture, Science.

D. Industrial Arts (1967 and 1968 Higher School Certificate Examinations only).

(b) The subjects shall include:—

(i) English,

(ii) four subjects at the first or second level, and,

(iii) one subject chosen from each of the Groups B and C and of these two subjects at least one must be from Section (i) of either Group B or Group C at the first or second level.

(c) The subjects shall NOT include both Art and Music.

3. Mathematics and Science both passed as full courses together shall, for the purpose of matriculation, be counted as three subjects, but otherwise each shall count as one subject.

4. The qualification for matriculation must be obtained at one examination.

5. In addition to the above requirements a candidate for admission to any particular faculty, course or subject shall satisfy the special requirements, if any, pertaining to that faculty, course or subject as set out in the following Schedule A. Where these additional requirements are not satisfied at the same examination as the requirements listed in paragraph 2 they may be met at a separate examination.

6. (a) Notwithstanding the provisions of Clauses 2, 3 and 5 of these requirements, any candidate who has taken the Higher School Certificate Examination in the subject of English and no fewer than any four other subjects named in Clause 2, at any level, may be admitted to matriculation provided he has reached a standard determined from time to time by the Professorial Board.*

   (b) Mathematics and Science both taken as full courses together shall, for the purpose of this clause, be counted as three subjects.

   (c) A candidate qualifying for matriculation under this clause may also be admitted to a particular faculty, course or subject provided:—

      (i) he satisfies the special requirements pertaining to that faculty, course or subject as set out in the following Schedule A, or

      (ii) the Professorial Board* deems that his programme of studies for, and his performance at, the Higher School Certificate Examination constitute an adequate preparation for his admission to the particular faculty, course or subject.

*See page 17 for the Professorial Board's decisions on these matters.

SCHEDULE A

ADDITIONAL FACULTY, COURSE AND SUBJECT REQUIREMENTS IN TERMS OF CLAUSE FIVE

(A) FACULTY REQUIREMENTS

APPLIED SCIENCE, ENGINEERING, MEDICINE, SCIENCE

Passes in Mathematics and Science at the first or second level full course.

ARCHITECTURE

Passes in Mathematics at the first or second level full course and in Science at the first or second level full course or second level short course provided that the Physics option has been taken in the short course.

COMMERCE

Passes in English at the first or second level and Mathematics at the first or second level full course or second level short course.

ARTS

Passes in English at the first or second level.

(B) COURSE REQUIREMENTS

INDUSTRIAL ARTS (B.Sc. and B.Sc. (Tech.)) AND SHEEP AND WOOL TECHNOLOGY (Education Option) (B.Sc.)

Passes in Science at the first or second level full course and in Mathematics at the first or second level full or short course provided that a student electing to include the subject Mathematics I in his University course shall have passed Mathematics at the first or second level full course.

SOCIAL WORK (B.Soc.Wk.)

As for Faculty of Arts.

(C) SUBJECT REQUIREMENTS

FRENCH I

Pass in French at the first or second level.

GERMAN I

Pass in German at the first or second level or pass in Introductory German.

INTRODUCTORY GERMAN, INTRODUCTORY SPANISH OR PRELIMINARY ITALIAN

Pass in any other foreign language at the first or second level.

ECONOMICS II OR ECONOMICS III

Passes in English at the first or second level and Mathematics at the first or second level full course or second level short course.

MATHEMATICS I

Pass in Mathematics at the first or second level full course.

GEOLOGY I

Pass in Science at the first or second level full course.

CHEMISTRY I, PHYSICS I OR GENERAL AND HUMAN BIOLOGY

Passes in Mathematics and Science at the first or second level full course.

SECTION B

SUPPLEMENTARY PROVISIONS FOR MATRICULATION

1. Notwithstanding the provisions of Section A above, candidates may be accepted as "matriculated students" of the University under the following conditions subject to the approval of the Professorial Board:—

   (a) Any person who holds a diploma from the New South Wales Department of Technical Education, or any other Technical College which may from time to time be recognised by the University, may be admitted to the University as a "matriculated student" with such status as the Board may determine, provided that, in the opinion of the Board, the applicant's qualifications are sufficient for matriculation to the Faculty nominated.

   (b) The Board may admit as a "matriculated student" in any Faculty with such status as the Board may determine in the circumstances:

      (i) A graduate of any approved University.

      (ii) An applicant who presents a certificate from a University showing that he has a satisfactory record and is qualified for entrance to that University, provided that in the opinion of the Board there is an acceptable correspondence between the qualifying conditions relied upon by the applicant and conditions laid down for matriculation to the nominated Faculty of the University of New South Wales.

   (c) (i) Any person who has completed the first year of the course at the Royal Military College of Australia and submits a certificate from the Commandant to that effect may be admitted as a "matriculated student" of the University.

(ii) Any person who has completed a full course of at least three years' prescribed study at the Royal Military College of Australia and produces a certificate from the Commandant to that effect may be admitted as a "matriculated student" of the University with such status as the Board may determine.

(d) Any person who has completed satisfactorily the passing out examination of the Royal Australian Naval College and submits a certificate from the Commanding Officer may be admitted as a "matriculated student" of the University.

(e) (i) Any person who has completed the first year of the course at the Royal Australian Air Force College and submits a certificate from the Commandant to that effect, may be admitted as a "matriculated student" of the University.

(ii) Any person who has completed two years of the course at the Royal Australian Air Force College and submits a certificate from the Commandant to that effect, may be admitted as a "matriculated student" of the University with such status as the Board may determine.

(f) An applicant who presents a certificate from another University showing that he is qualified for entrance to that University and setting out the grounds of such qualification, provided that in the opinion of the Professorial Board, there is an acceptable correspondence between the qualifying conditions relied upon by the applicant and the conditions laid down for matriculation to the nominated Faculty of the University of New South Wales.

2. (a) The Professorial Board may in special cases, including cases concerning persons of other than Australian education, declare any person qualified to enter a Faculty as a "provisionally matriculated student" although he has not complied with the requirements set out above, and in so doing may prescribe the completion of certain requirements before confirming the person's standing as a "matriculated student". Students who satisfactorily complete these requirements will be permitted to count the courses so passed as qualifying for degree purposes.*

*The Professorial Board has determined that normally confirmation of standing as a "matriculated student" will require the successful completion of not less than half the normal programme in the first year of enrolment.

(b) Persons over the age of twenty-five years may be admitted to provisional matriculation status provided that:—

(i) they have satisfactorily completed an approved course of systematic study extending over at least three years after passing the School Certificate Examination, or

(ii) they satisfy the Professorial Board that they have reached a standard of education sufficient to enable them profitably to pursue the first year of the proposed course.

(c) Any applicant for provisional status may be required to take such examination as the Professorial Board may prescribe before such status is granted.

3. The Professorial Board may, at its discretion, permit a person, who does not satisfy the requirements for admission, to attend lectures in a subject or subjects at the University, on payment of the prescribed fees provided that such person shall not necessarily have the privileges of "matriculated students" and shall not be eligible to proceed to a degree.

SECTION C

SPECIAL MATRICULATION REQUIREMENTS TO OPERATE IN 1968 ONLY

(DETERMINATIONS OF THE PROFESSORIAL BOARD IN TERMS OF CLAUSE 6 OF THE NORMAL REQUIREMENTS AS SET OUT IN SECTION A ABOVE)

The Professorial Board has determined that, *for 1968 only,*

(a) a candidate who qualifies by means of the 1967 Higher School Certificate examination to matriculate in any other university in New South Wales or in the Australian National University shall be deemed to have qualified to matriculate in the University of New South Wales under the provisions of Clause 6 of the matriculation requirements set out in Section A above.

(b) a candidate who achieves at the 1967 Higher School Certificate Examination *a standard acceptable to the Professorial Board* in English and any four other subjects approved for matriculation purposes shall be deemed to have qualified to matriculate in the University of New South Wales under the provisions of Clause 6 of the

matriculation requirements set out in Section A above. For this purpose Mathematics and Science both taken as full courses shall count as three subjects.

(c) the special requirements pertaining to entry to a particular faculty, course or subject, referred to in Clause 6 of Section A, shall be as set out in Schedule B.

SCHEDULE B

SPECIAL FACULTY, COURSE OR SUBJECT REQUIREMENTS IN TERMS OF CLAUSE 6 OF THE NORMAL REQUIREMENTS AS SET OUT IN SECTION A ABOVE (TO OPERATE IN 1968 ONLY)

A. FACULTY REQUIREMENTS

APPLIED SCIENCE, ENGINEERING, MEDICINE AND SCIENCE

Passes in Science at the second level short course or higher AND in Mathematics either at the second level full course or higher or *at the second level short course at a standard acceptable to the Professorial Board.*

ARCHITECTURE

Passes in Mathematics at the second level short course or higher AND in Science, at the second level short course or higher.

COMMERCE

Passes in Mathematics at the second level short course or higher AND in English at either the second level or higher or *at the third level at a standard acceptable to the Professorial Board.*

ARTS

A pass in English at the second level or higher, or a pass at the third level *at a standard acceptable to the Professorial Board.*

B. COURSE REQUIREMENTS

(Courses under the control of the Board of Vocational Studies)

SOCIAL WORK COURSE (Bachelor of Social Work)

As for Faculty of Arts.

INDUSTRIAL ARTS COURSE (B.Sc. and B.Sc. (Tech.)) and SHEEP AND WOOL TECHNOLOGY (EDUCATION OPTION) COURSE (B.Sc.)

As for Faculties of Applied Sciences, Engineering, Medicine and Science.

C. SUBJECT REQUIREMENTS

10.011 HIGHER MATHEMATICS I	A pass in Mathematics at the second level full course or higher.
10.001 MATHEMATICS I	A pass in Mathematics *at the second level short course at a standard acceptable to the Professorial Board.*
10.021 MATHEMATICS IT	A pass in Mathematics at the second level short course.
PHYSICS I CHEMISTRY I GENERAL AND HUMAN BIOLOGY GEOLOGY I	As for Faculties of Applied Science, Engineering, Medicine and Science.
ECONOMICS II ECONOMICS III	As for Faculty of Commerce.
FRENCH I	A pass in French at second level or higher.
GERMAN I	Pass in German at second level or higher or in Introductory German.
INTRODUCTORY GERMAN INTRODUCTORY SPANISH PRELIMINARY ITALIAN	Pass in any other foreign language at second level or higher.

NOTE: Candidates who depend for matriculation on a pass in a subject "at a standard acceptable to the Professorial Board" (indicated in italics throughout the above statement) may ascertain whether they have satisfied this standard by **written** application to the Registrar which must be lodged not later than 22nd January, 1968.

ENROLMENT PROCEDURE FOR UNDERGRADUATE COURSES

First Enrolments—Application for enrolment in first year must wherever possible be made in person to the Student Enrolment Bureau, Unisearch House, 221 Anzac Parade, Kensington (across

from the main University campus), as soon as the results of the Higher School Certificate Examination are available, but in any event not later than 22nd January.

Country residents and metropolitan students who are unable to attend in person and who wish to enrol with the University should write to the Registrar, P.O. Box 1, Kensington, 2033, specifying the course in which they wish to enrol and requesting a form on which to make their preliminary application. This form must be returned not later than 22nd January.

In 1968, in all faculties except Medicine where a quota will be necessary, all properly qualified candidates for enrolment will, it is hoped, be accepted. However, should enrolment estimates be exceeded or staff shortages become acute, restrictions may have to be imposed in other faculties. Early application, therefore, is essential.

New students complete their enrolment at a specified appointment time in the second week before the commencement of First Term. Fees must be paid on the day of the appointment. However, in special circumstances and provided class places are still available, students may be accepted for enrolment after the prescribed week subject to the payment of a late fee.

Applicants for enrolment with advanced standing or applicants relying on overseas examinations for matriculation should lodge an application with the Admissions Office prior to 1st October of the year preceding that in which admission is sought.

First Year Repeats—First Year students who fail all subjects at the annual examinations and who are not granted any deferred examinations must apply for re-enrolment to the Student Enrolment Bureau at the time set out above for First Enrolments. Other first year repeat students follow the procedure set out below for Later Year Enrolments.

Complete details of the enrolment requirements are contained in the booklet "Enrolment Procedure for New Students", which may be obtained at the Enrolment Bureau when making application to enrol.

Later Year Enrolments—All students enrolling other than for the first time should do so through the appropriate school. Full-time students, other than those in the Science course, must attend at the time and place during Enrolment Week as set out in the booklet published each year, "Enrolment Procedure for Students

Re-enrolling". Enrolment forms for these students will be prepared and available at the enrolment centre.

All full-time and part-time students in the Applied Chemistry course are required to complete an enrolment form in the last fortnight of third term. The forms may be obtained from the office of the School of Chemistry (Mr. A. Funnell). An appointment will then be made to complete enrolment in accordance with the special arrangements made by the school. These arrangements are published in the booklet, "Enrolment Procedure for Later Year Students".

A late fee of $6 will be incurred by students failing to enrol during Enrolment Week.

Miscellaneous Subject Enrolments—Students may be permitted to enrol for miscellaneous subjects (i.e., as students not proceeding to a degree or diploma) provided the Head of the School offering the subject considers it will be of benefit to the student and there is accommodation available. Under no circumstances will subjects taken in this way count towards a degree or diploma.

Students who have completed the final examinations but have a thesis still outstanding are required to enrol for the period necessary to complete the thesis and to pay the requisite fees.

Course details must be completed during the prescribed Enrolment Week. For details of fee requirements, including late fee provisions, see under Fees.

Final Dates for Enrolment—No enrolments will be accepted from *new students* after the end of the second week of term (18th March, 1968) except with the express approval of the Registrar and the Head of the School concerned; no *later year enrolments* will be accepted after 31st March without the express approval of the Registrar which will be given in exceptional circumstances only.

UNIVERSITY UNION CARD

All students other than miscellaneous students are issued with a University Union membership card. This card must be carried during attendance at the University and shown on request.

The number appearing on the front of the card in the space at the top right-hand corner is the student registration number used in the University's records. This number should be quoted in all correspondence.

The card must be presented when borrowing from the University libraries, when applying for travel concessions and when notifying a change of address. It must also be presented when paying fees on re-enrolment each year when it will be made valid for the year and returned. Failure to present the card could result in some inconvenience in completing re-enrolment.

A student who loses a Union card must notify the University Union as soon as possible.

New students will be issued with University Union cards by mail to their term address as soon as possible after fee payment. In the meantime, the fees receipt form should be carried during attendance at the University and shown on request. If the Union card is not received within three weeks of fee payment the University Union should be notified.

FEES*

Fees for Undergraduate Courses

Where course fees are assessed on the basis of term hours of attendance the hours for each subject for purposes of fee assessment shall be those prescribed in the Calendar, irrespective of any variation from the prescribed hours which may be necessary in conducting the subject.

For the purpose of fee determination for courses in the Faculty of Science assessment is on a term basis. A full-time course fee will be charged for any term where more than 15 hours' per week instruction, etc., is involved.

(i) Full-time Course Fee (more than 15 hours' attendance per week)—$110 per term.

(ii) Part-time Course Fee (over 6 hours' and up to 15 hours' attendance per week)—$55 per term.

(iii) Part-time Course Fee (6 hours' or less attendance per week)—$28 per term.

(iv) Course Continuation Fee—A fee of $23 per annum (no term payment) is payable by:—

(a) Students who have once been enrolled for a thesis and have only that requirement outstanding; OR

(b) Students given special permission to take annual examinations without attendance at the University. (Students in this category are not required to pay the subscriptions to the University Union, the Students' Union, the Sports Association and the Library Fee).

Miscellaneous Subjects

Undergraduate subjects taken as "miscellaneous subjects" (i.e., not for a degree or diploma) or to qualify for registration as a candidate for a higher degree are assessed on an hourly basis in accordance with the schedule above.

*** Fees quoted are current at time of publication and may be altered by Council without notice.**

Students given approval to enrol in a miscellaneous subject or subjects in addition to being enrolled in a course are assessed according to the total hours of attendance as if the additional subject(s) formed part of the course.

Other Fees

In addition to the course fees set out above all registered undergraduates will be required to pay—

Matriculation Fee—$7—payable at the beginning of first year.

Library Fee—annual fee—$12.

University Union*—entrance fee—$20.

Student Activities Fees

University Union*—$12—annual subscription.

Sports Association*—$2—annual subscription.

Students' Union*—$4—annual subscription.

Miscellaneous—$10—annual fee.

Total—$28.

Graduation or Diploma Fee—$7—payable at the completion of the course.

Depending on the course being taken, students may also be required to pay—

Applied Psychology Kit Hiring Charge—$2 per kit. Additional payment for breakages and losses in excess of $1.

Biochemistry Kit Hiring Charge—$4 per kit. Additional charge for breakages and losses in excess of $1 may be required.

Chemistry Kit Hiring Charge—$4 per kit. Additional charge for breakages and losses in excess of $1 may be required.

Excursion Fee—$2 per subject (biology, botany, zoology entomology).† Geography (2 excursions) $4.

Special Examination Fees

Deferred examination—$5 for each subject.

Examinations conducted under special circumstances—$7 for each subject.

Review of examination result—$7 for each subject.

* Life members of these bodies are exempt from the appropriate fee or fees.

† Students in the original Applied Biology degree course pay an excursion fee of $1 per subject for botany, zoology and entomology.

Late Fees

First Enrolments

Fees paid on the late enrolment session and before the commencement of term	$6
Fees paid during the first and second weeks of term	$12
Fees paid after the commencement of the third week of term with the express approval of the Registrar and Head of the School concerned	$23

Re-Enrolments

First Term

Failure to attend enrolment centre during enrolment week	$6
Fees paid after the commencement of the third week of term to 31st March	$12
Fees paid after 31st March where accepted with the express approval of the Registrar	$23

Second and Third Terms

Fees paid in third and fourth weeks of term	$12
Fees paid thereafter	$23
Late lodgement of Application for Admission to Examinations (late applications will be accepted for three weeks only after the prescribed dates)	$5

Withdrawal from Course

Students withdrawing from a course are required to notify the Registrar in writing. Fees for the course accrue until a written notification is received.

Where notice of withdrawal from a course is received by the Registrar before the first day of First Term a refund of all fees paid other than the matriculation fee will be made.

Where a student terminates for acceptable reasons a course of study before half a term has elapsed, one half of the term's fee may be refunded. Where a student terminates a course of study after half a term has elapsed, no refund may be made in respect of that term's fees.

The Library fee is an annual fee and is not refundable where notice of withdrawal is given after the commencement of First Term.

On notice of withdrawal a partial refund of the Student Activities Fees is made on the following basis:

University Union—$2 in respect of each half term.

University of New South Wales Students' Union—where notice is given prior to the end of the fifth week of first term $2, thereafter no refund.

University of New South Wales Sports Association—where notice is given prior to 30th April a full refund is made, thereafter no refund.

Miscellaneous—where notice is given prior to 30th April $5, thereafter no refund.

PAYMENT OF FEES

Completion of Enrolment

All students are required to attend the appropriate enrolment centre during the prescribed enrolment period* for authorisation of course programme. Failure to do so will incur a late fee of $6.

First year students (including students repeating first year) must complete enrolment (including fee payment) before they are issued with class timetables or permitted to attend classes. A first year student who has been offered a place in a course to which entry is restricted and fails to complete enrolment (including fee payment) at the appointed time may lose the place allocated.

Fees should be paid during the prescribed enrolment period but will be accepted without incurring a late fee during the first two weeks of First Term. (For late fees see below.) No student is regarded as having completed an enrolment until fees have been paid. Fees will not be accepted (i.e., enrolment cannot be completed) from new students after the end of the second week of term (i.e., 15th March, 1968), and after 31st March from students who are re-enrolling, except with the express approval of the Registrar, which will be given in exceptional circumstances only.

Payment of Fees by Term

Students who are unable to pay their fees by the year may pay by the term, in which case they are required to pay First Term course fees and other fees for the year, within the first two weeks

* The enrolment periods for Sydney students are prescribed annually in the leaflets "Enrolment Procedure for New Students" and "Enrolment Procedure for Students Re-enrolling".

of First Term. Students paying under this arrangement will receive accounts from the University for Second and Third Term fees. These fees must be paid within the first two weeks of each term.

Assisted Students

Scholarship holders or Sponsored Students who have not received an enrolment voucher or appropriate letter of authority from their sponsor at the time when they are enrolling should complete their enrolment paying their own fees. A refund of fees will be made when the enrolment voucher or letter of authority is subsequently lodged with the Cashier.

Extension of Time

Any student who is unable to pay fees by the due date may apply in writing to the Registrar for an extension of time. Such application must give year or stage, whether full-time or part-time, and the course in which the applicant wishes to enrol, state clearly and fully the reasons why payment cannot be made and the extension sought, and must be lodged before the date on which a late fee becomes payable. Normally the maximum extension of time for the payment of fees is until 31st March for fees due in First Term and for one month from the date on which a late fee becomes payable in Second and Third Terms.

Where an extension of time is granted to a First Year student in First Term, such student may only attend classes on the written authority of the Registrar, but such authority will not normally be given in relation to any course where enrolments are restricted.

Failure to Pay Fees

Any student who is indebted to the University and who fails to make a satisfactory settlement of his indebtedness upon receipt of due notice ceases to be entitled to membership and privileges of the University. Such a student is not permitted to register for a further term, to attend classes or examinations, or to be granted any official credentials.

No student is eligible to attend the annual examinations in any subject where any portion of his course fees for the year is outstanding after the end of the fourth week of Third Term (27th September, 1968).

In very special cases the Registrar may grant exemption from the disqualification referred to in the two preceding paragraphs upon receipt of a written statement setting out all relevant circumstances.

RULES RELATING TO STUDENTS

COURSE TRANSFERS AND CLAIMS FOR ADVANCED STANDING

Students wishing to transfer from one course to another (including transfer from full-time to part-time study or vice versa) must make application to the Admissions Office as soon as possible and preferably before Enrolment Week. The Admissions Office will give each applicant an acknowledgement of his application to transfer.

Having made application to the Admissions Office students transferring are required to attend the School Enrolment Centre at the time set down for the year/stage of the new course in which they expect to enrol. They must present the letter granting approval of the transfer to the enrolling officer.

Students who have not received a letter granting approval to the transfer before the date on which they are required to enrol must present their acknowledgement to the enrolling officer who will decide whether to permit them to attend classes provisionally in the new course. Students who are permitted to attend classes provisionally should not pay fees until they have received their letter granting formal approval to transfer.

Students claiming advanced standing (exemptions from subjects) by reason of courses completed in other places should do so by applying to the Registrar on the appropriate form. Copies of the form may be obtained from the Admissions Office.

CHANGES IN COURSE PROGRAMMES AND WITHDRAWAL FROM SUBJECTS

Students seeking approval for variation of enrolment programme or seeking to withdraw from subjects must make application to the Head of the School responsible for the course on a form available from school offices. The Registrar will inform students of the decision. Approval of withdrawal from subjects is not automatic, each application being determined after considering the circum-

stances advanced as justifying withdrawal. It should be noted that withdrawal from a subject or course after Term 1 will not be approved unless there are special circumstances. It is emphasized that failure to sit for the examination in any subject for which a student has enrolled is regarded as failure to pass that examination unless written approval to withdraw has been given by the Registrar.

RESUMPTION OF COURSES

Students wishing to resume their studies after an absence of twelve months or more are required to apply to the Admissions Office for permission to re-enrol. Students re-enrolling in this way will normally be required to satisfy conditions pertaining to the course at the time of re-enrolment. This condition applies also to students who have been re-admitted to a course after exclusion under the rules restricting students re-enrolling.

ANNUAL EXAMINATIONS

The annual examinations take place in November-December for students in 30-week courses, and in September for students in 21- and 24-week courses. Timetables showing time and place at which individual examinations will be held are posted on the central notice boards. Misreading of the timetable is not an acceptable excuse for failure to attend an examination. Examination results are posted to the term addresses of students. No results will be given by telephone.

All students (including students enrolled for a thesis only) must lodge an application for admission to examinations by 19th July, 1968.

The Accountant is authorized to receive application forms during the three weeks immediately following the prescribed closing date if they are accompanied by a late fee of $5. Applications forwarded more than three weeks after the closing date will not be accepted except in very exceptional circumstances and with the approval of the Registrar. Where an application is not accepted the student concerned is not eligible to sit for the examination.

Applications lodged prior to the due date will be acknowledged by postcard. Students who do not receive an acknowledgement within ten days of lodging the application should contact the Examinations Branch or the office of the college attended.

As a result of the application of machine methods to the processing of examination results, all students in Sydney, Wollongong and Broken Hill receive a pro-forma application for admission to examinations listing the subjects for which the student has formally enrolled. The return of this pro-forma duly completed constitutes the application for admission to examinations. Pro-forma applications will be posted to students on 30th June. Any student who does not receive a pro-forma application must contact the Examinations Branch prior to the date prescribed for the return of applications.

RESTRICTION UPON STUDENTS RE-ENROLLING

The University Council has adopted the following rules governing re-enrolment with the object of requiring students with a record of failure to show cause why they should be allowed to re-enrol and retain valuable class places. These rules will be applied retrospectively from January, 1962.

(i) As from 1st January, 1962, a student shall show cause why he should be allowed to repeat a subject in which he has failed more than once. (Failure in a deferred examination as well as in the annual examination counts, for the purpose of this regulation, as one failure.) Where such subject is prescribed as a part of the student's course he shall be required to show cause why he should be allowed to continue the course. A student in the medical course shall show cause why he should be allowed to repeat the second year of the course if he has failed more than once to qualify for entry to the third year.

(ii) Notwithstanding the provisions of clause (i), a student shall be required to show cause why he should be allowed to continue a course which he will not be able to complete in the time set down in the following schedule:—

Number of years in course	*Total time allowed from first enrolment to completion (years)*
3	5
4	6
5	8
6	9
7	11
8	12

*(iii) No full-time student shall, without showing cause, be permitted to continue a course unless all subjects of the first year of his course are completed by the end of his second year of attendance. No student in the Faculty of Arts shall, without showing cause, be permitted to continue a course unless he completes four subjects, one of which must be from Group II, by the end of his second year of attendance.

No part-time student shall, without showing cause, be permitted to continue a course unless all subjects of the first two stages of his course are completed by the end of his fourth year of attendance and all subjects of the third and fourth stages of his course by the end of his seventh year of attendance.

No student in the Faculty of Medicine shall, without showing cause, be permitted to continue with the medical course unless he completes the second year of the course by the end of his third year of attendance, and the third year of the course by the end of his fourth year of attendance.

(iv) A student who has a record of failure in a course at another University shall be required to show cause why he should be admitted to this University. A student admitted to a course at this University following a record of failure at another University shall be required to show cause, notwithstanding any other provisions in these rules, why he should be permitted to continue in that course if he is unsuccessful in the annual examinations in his first year of attendance at this University.

* Rule (iii) in so far as it relates to students in the Faculty of Arts will apply retrospectively as from the 1st January, 1967, and in so far as it relates to students in the Faculty of Medicine, will apply to students enrolling for the first time in 1967 or thereafter.

(v) Any student excluded under any of the clauses (i)-(iii) may apply for re-admission after two academic years and such application shall be considered in the light of any evidence submitted by him.

(vi) A student wishing "to show cause" under these provisions shall do so in writing to the Registrar. Any such application shall be considered by the Professorial Board, which shall determine whether the cause shown is adequate to justify his being permitted to continue his course or re-enrol as the case may be.

(vii) The Vice-Chancellor may on the recommendation of the Professorial Board exclude from attendance in a course or courses any student who has been excluded from attendance in any other course under the rules governing re-enrolment and whose record at the University demonstrates, in the opinion of the Board and the Vice-Chancellor, the student's lack of fitness to pursue the course nominated.

(viii) A student who has failed, under the provisions of Clause (vi) of these rules, to show cause acceptable to the Professorial Board why he should be permitted to continue in his course, and who has subsequently been permitted to re-enrol in that course or to transfer to another course, shall also be required to show cause, notwithstanding any other provisions in these rules, why he should be permitted to continue in that course if he is unsuccessful in the annual examinations immediately following the first year of resumption or transfer of enrolment as the case may be.

(ix) A student may appeal to an Appeals Committee constituted by Council for this purpose, against his exclusion by the Professorial Board from any subject or course.

RE-ADMISSION AFTER EXCLUSION

Applications for re-admission must be made on the standard form and lodged with the Registrar not later than 30th June of the year prior to that for which re-admission is sought. An application should include evidence of appropriate study in the subjects (or equivalents) on account of which the applicant was excluded. In addition, evidence that the circumstances which were deemed to operate against satisfactory performance at the time of exclusion

are no longer operative or are reduced in intensity, should be furnished. An applicant may be required to take the annual examinations in the relevant subjects as qualifying examinations in which case re-admission does not imply exemption from the subject.

It should be noted that a person under exclusion may not be enrolled in miscellaneous subjects unless he has received the approval of the Professorial Board.

Persons who intend applying for re-admission to the University at a future date may seek advice as to ways in which they may enhance their prospects of qualifying for re-admission. Enquiries should be made on a form obtainable from the Examinations Branch, and lodged with the Registrar.

STUDENT SERVICES

THE LIBRARY

The University library is on the upper campus and adjacent to the Chancellery and the Morven Brown and John Goodsell Buildings. The Bio-Medical Library is in the Biological Sciences Building with a branch at Prince Henry Hospital ('Phone: 661-0111). Library services are also available at Sydney Technical College, Wollongong University College and Broken Hill Division.

Each library provides a reference and lending service for staff and students, and is open in term during day and evening sessions. The library service provided by the Sydney Technical College Library is restricted to staff and students in the Department of Optometry.

Staff and students must register with the library or libraries from which they intend to borrow books.

THE UNIVERSITY UNION

The University Union is a common meeting ground for all students. Eating and general recreational facilities are available, as well as a shop for stationery and other student requisites, branches of several banks, a pharmacy, a branch of Anthony Horderns, and hairdressing facilities. Membership is compulsory for all registered students.

STUDENT ACCOMMODATION

Residential Colleges

Accommodation for students is provided within the complex of the Residential Colleges of the University which comprise Basser College, Phillip Goldstein Hall, Philip Baxter College and Post-Graduate Hall. The College complex houses 500 men and women students, as well as staff members. Tutors in residence provide tutorial assistance in a wide range of subjects.

Board and residence fees, which are payable on a term basis, amount to $18.50 per week. Intending students should apply in writing to the Master, Box 24, Post Office, Kensington, N.S.W., 2033, from whom further information is available.

Other Accommodation

Students requiring other than Residential College accommodation may make application to the Student Amenities Service where current lists are kept of accommodation available at recognised boarding houses, private homes, and in serviced and unserviced apartments.

STUDENT COUNSELLING AND RESEARCH UNIT

Prospective students seeking advice or guidance regarding the selection and planning of courses (particularly in relation to a career), or advice regarding their suitability for a particular course, are invited to consult the University's Student Counselling and Research Unit. Appointments may be made by telephone (663-0351, extensions 2600 to 2605).

In addition to its counselling service, the Unit provides a variety of study skills programmes throughout the year, on a group or individual basis. Programmes offered in the past have included Reading Improvement, Study Methods, Written Expression, Note Taking, Studying Mathematics, Improving Listening, Preparing for Statistics.

STUDENT AMENITIES UNIT

This Unit is closely associated with the Sports Association and also handles applications for student concession fares and provides a service for students requiring other than College accommodation.

STUDENT EMPLOYMENT UNIT

Assistance is offered in finding full-time employment for evening students, and permanent employment after graduation. The Unit also administers the University's industrial training programme and is located in the Chancellery (Administration Building) located off High Street.

STUDENT HEALTH UNIT

A student health and first aid centre, staffed by a qualified medical practitioner and a nursing sister, is provided by the University. Students are encouraged to attend the centre for advice on all matters pertaining to their health.

SCHOLARSHIPS, BURSARIES AND CADETSHIPS

Students undertaking courses in the Faculty of Science are eligible to apply for the following scholarships or cadetships.

University Scholarships

The University annually awards up to fifteen scholarships tenable in degree courses to students who have matriculated at the Higher School Certificate Examination; ten scholarships to students who have completed certificate courses (Department of Technical Education); ten scholarships to students who have completed Trade Courses (Department of Technical Education); and ten scholarships to part-time students who have taken the Diploma Entrance course of the Department of Technical Education. The scholarships are tenable in any faculty and exempt the holder from payment of course fees during the currency of the scholarship. Scholarships will be awarded in order of merit on the Higher School Certificate Examination results. They may be held only by persons who do not hold another award. Applications must be lodged after publication of Higher School Certificate Examination results and after the announcement of the award of Commonwealth Scholarships, but not later than 31st January.

Commonwealth University Scholarships

There are three types of scholarships, which are available for both Pass and Honours courses: (a) Open Entrance Scholarships; (b) Later Year Scholarships; (c) Mature Age Scholarships. Benefits include payment of tuition fees, examination fees, matriculation fees, degree fees, and other compulsory fees. Full-time students may also apply for a living allowance, which is subject to a means test.

The closing date for applications for Commonwealth University Scholarships is 30th September of the year immediately preceding the year for which the scholarship is desired. Applications for renewal of scholarship must be made before 31st October each year. Further information, application forms and the Common-

wealth Scholarship Handbook may be obtained from the Officer-in-Charge, New South Wales Branch Office, Department of Education and Science, La Salle Building, 70 Castlereagh Street, Sydney, 2000 (telephone 27-5475).

The John Heine Memorial Scholarship

Students qualified to enrol in the third year of the full-time Applied Chemistry Course or in the Applied Chemistry Conversion Course, and who are employees of a member of the Metal Trades Employers' Association are eligible to apply for the John Heine Memorial Scholarship.

The scholarship has a total value of $700, which is paid at the following rates:—

(i) Final two years of the Applied Chemistry Degree Course:

1st year	$300
2nd year	$400

(ii) Applied Chemistry Conversion Course:

1 full-time year	$500
2 part-time years—	
1st year	$200
2nd year	$300

Applications should be made not later than 31st January of each year to the Secretary, John Heine Memorial Foundation, c/- Metal Trades Employers' Association, 101 Walker Street, North Sydney.

Bursaries Awarded by the Bursary Endowment Board

A number of Bursaries tenable at the University are awarded to candidates of merit at the Higher School Certificate Examination whose family income falls within certain limits prescribed by the Bursary Endowment Board.

Applications should be made to the Secretary, Bursary Endowment Board, c/- Department of Education, Bridge St., Sydney.

Scholarships in Optometry

The Australian Optometrical Association, the Australian Optometrical Association (New South Wales Division), and Gibb & Beeman (Spectacle Makers) Pty. Ltd., offer annually one scholarship each to the value of $500 per annum. These scholarships are available to students who desire to enrol in the full-time degree course in Optometry leading to the degree of Bachelor of Optometry at the University of New South Wales.

Applicants must be residents of New South Wales. While scholarship holders are not under any bond or obligation, it is expected that they will practise optometry in Australia. Candidates must be under 21 years of age at the time of application.

Each scholarship will normally be tenable for the duration of the course but its tenure shall be at all times subject to the holder maintaining a standard of conduct and progress acceptable to the Professorial Board. The annual allowance of the scholarship is payable to the holder in three equal amounts at the commencement of each term of the University year.

These scholarships will be awarded on the understanding that applicants will normally hold a Commonwealth Scholarship which covers the cost of University fees. However, applicants who are not holders of a Commonwealth Scholarship may also be considered.

Application for these scholarships, on forms obtainable from the Registrar, must be lodged with the Registrar after publication of examination results and the announcement of the award of Commonwealth Scholarships, but not later than 31st January each year.

Traineeships and Cadetships

Traineeships and cadetships are offered by the N.S.W. Public Service Board and by the Commonwealth Service.

These traineeships make it possible for selected employees of the Commonwealth or State Public Services to undertake full-time University study.

Students receive a salary during their years at the University and are required to undertake their industrial training with the department in which they are employed. Full details of cadetships and traineeships available at any one time may be had, in the case of the State authorities, from the N.S.W. Public Service Board, 19 O'Connell Street; and in the case of the Commonwealth authorities, from the Employment Officer, Commonwealth Public Service Inspector's Office, Commonwealth Centre, Chifley Square (cnr. Phillip and Hunter Streets) (telephone 28-5701).

Department of Railways Cadetships

The Department of Railways each year offers cadetships in Chemistry. Cadet chemists are enrolled in the appropriate part-time course leading to the degree of B.Sc. and are required to

enter into a bond of $1000 to remain in the employ of the Department for five years after completion of the cadetship. Cadets have their course fees paid and receive a salary in accordance with the award rates.

The following salaries were in effect in September, 1967:—

1st Year	2nd Year	3rd Year	4th Year	5th Year
$1246	$1501	$1710	$1876	$2066

Upon reaching the age of 21, cadets receive a salary of $2195 per annum.

Vacancies for cadets are advertised between November and January and full details are given in a brochure available during this period from the Employment Personnel Officer, Department of Railways, 509 Pitt Street, Sydney.

Sponsored Students

Many private industrial and commercial organisations sponsor students in Science courses. The conditions under which students are sponsored vary from company to company, but in general the company meets all compulsory fees. Industrial training is generally undertaken with the sponsoring company.

Students are advised to consult the Admissions Office or the Student Counselling Unit at Kensington for further details concerning scholarships and cadetships and for information concerning companies sponsoring students.

FACULTY OF SCIENCE COURSES

The courses available within the Faculty of Science are of two types. The first is the Science Course, which allows a student to select sequences from a variety of the sciences. The regulations governing this course and the list of subjects available appear below. The course is of three years' duration for the degree of Bachelor of Science, with an additional year for Honours. The course may also be taken on a part-time basis, normally requiring a minimum of seven years' study, and leads to the degree of Bachelor of Science (Pass).

The second type of course offered by the Faculty consists of the more specialised courses in Applied Chemistry, Applied Psychology and Optometry. The Applied Chemistry and Applied Psychology courses lead to the degree of Bachelor of Science and the Optometry course to the degree of Bachelor of Optometry. The Applied Chemistry course may be completed in three years of full-time study or six years of part-time study; an additional full-time year (or two part-time years) is required for Honours. The Applied Psychology course, formerly a part-time course only, was revised at the end of 1962, and since 1963 both full-time (four years) and part-time (six years) courses have been offered at Pass or Honours level. For students who commenced prior to 1963 the old part-time course of five years (pass) or six years (honours) will continue to operate. The Optometry course is a four-year full-time course.

Details of the three special courses mentioned above are given under the titles of the Schools which provide them.

HONOURS COURSES

In general, Honours degrees are awarded after one year of extra study for full-time students or two years for part-time students. The requirements of the School in which the student is to take Honours are, broadly, that (i) he apply in writing to the Head of the School in which he anticipates working, during the final year in his pass course; and (ii) that he have a better than average record in his studies. He will be required to complete in a satisfactory manner such courses as the Head of the School pre-

scribes and engage in a programme of original research under the supervision of a staff member.

More precise details are given under the sections dealing with the various schools. For students in the Science Course, details are given under the section entitled "Requirements for Honours in the Science Course".

POSTGRADUATE COURSES

On completion of a first degree course (B.Sc.) the student may wish to proceed to a higher degree. This usually entails two or three years' research under direction. A limited number of Scholarships are available at this and other Universities, and these are competitive.

The regulations governing higher degrees are to be found in the University Calendar. A candidate thinking of undertaking such a course should first discuss the matter with the Head of the School in which he wishes to study.

Several courses at the postgraduate level, leading to the award of a Graduate Diploma are also available. These are in Applied Psychology, Food and Drug Analysis and Biochemical Engineering.

The course in applied psychology leads to the Diploma in Psychology (Dip.Psych.) and is specifically designed to provide professional training at an advanced level for graduates with at least three years of undergraduate training in psychology. In particular, the course aims to train students in the application of psychological theory and techniques to vocational and educational guidance, to clinical practice and/or to psychological problems in industry. The course is offered in one year of full-time study or two years of part-time study.

The course in Food and Drug Analysis is offered by the School of Chemistry on a part-time basis over two years and leads to a diploma (Dip.F.D.A.). The course is designed to provide systematic training at an advanced level for chemists who wish to extend their acquaintance with analytical techniques, and is thus suitable for those who wish to practise as public analysts.

The course in Biochemical Engineering is offered by the School of Biological Sciences, in conjunction with the School of Chemical Engineering, and leads to a diploma (Dip.Biochem.Eng.). Biochemical engineering problems are of increasing occurrence in a wide range of Australian industries and it is felt that this course will help to meet the need for trained personnel in this area. The course may be completed in one year of full-time study or over two years on a part-time basis.

GENERAL STUDIES COURSES

All undergraduates in faculties other than Arts are required to complete a number of general studies subjects. The general pattern and course outlines in the Faculty of Science are listed below.

Full-time Courses

Three-Year Courses

First Year: No general studies subjects.

Second Year: 26.501 English *or* 26.571 An Introduction to Modern Drama (each of 45 hours).

Third Year: Two 45-hour courses to be selected from:—

26.121	Psychology
26.151	Economics
26.301	Music
26.511	History
26.521	Philosophy
‡26.531	Sociology
26.541	Political Science
*26.561	Introduction to French Civilisation
†26.562/1	German Literature and Civilisation, Part I
†26.563/1	Spanish and Spanish American Literature, Part I
26.601	History of Technology
11.011H	History of Fine Arts
11.021H	History of Architecture

Except that students who have chosen 26.571 An Introduction to Modern Drama may select only one of the following electives:—

26.301	Music
26.601	History of Technology
11.011H	History of Fine Arts
11.021H	History of Architecture

*This course is of 90 hours' duration and counts as an elective plus an advanced elective. It is available to students whose General Studies programme includes an advanced elective and who have reached a reasonable standard in French at Matriculation.

†These subjects are given in English.

‡This subject will not be offered in 1968 by the Department of General Studies. Students wishing to do Sociology will have to enrol in the appropriate Arts course.

Four-Year Courses

In addition to the above requirements, students completing four-year courses, either Pass or Honours, will take a further course in one of the subjects already studied or may select 11.031H History of Fine Arts and Architecture. It should be noted, however, that 11.031H may not be chosen if either 11.011H or 11.021H has previously been taken. The other subjects require a previous course in the same subject as a pre-requisite.

The subjects offered are:—

26.122	Psychology
26.152	Economics
26.302	Music
26.502	English
26.512	History
26.522	Philosophy
26.532	Sociology (not offered in 1968)
26.542	Political Science
26.562/2	German Literature and Civilisation, Part II
26.563/2	Spanish and Spanish American Literature, Pt. II
26.602	History of Technology
11.031H	History of Fine Arts and Architecture

Students in the Applied Psychology course should note that they must select the following subjects: 26.501 in second year, 26.511 in third year, 26.521 in fourth year.

Part-time Courses

B.Sc. in Applied Chemistry: pass students must take 26.501 or 26.571 in their fourth year, one 45-hour course in fifth year, and a further 45-hour course in sixth year. Honours students take an additional advanced course.

B.Sc. in Applied Psychology: students must take 26.501 in their first year, 26.511 in second year, and 26.521 in fifth year.

B.Sc. in Science Course: as for full-time courses.

GENERAL STUDIES READING LISTS

26.121 Psychology

An introduction to general psychology by way of a course centred upon issues related to the study of personality-motivation, perception, learning, the nature of personality development and of social behaviour.

TEXT BOOK

Lindgren, H. C., Byrne, D., Petrinovich, L. *Psychology: An Introduction to a Behavioural Science.* Wiley.

or

Morgan, C. T. *Introduction to Psychology.* McGraw-Hill, 2nd ed., 1961.

REFERENCE BOOK

Gabriel, J. *Children Growing Up. The Development of Children's Personalities.* University of London Press, 2nd ed., 1965.

26.122 Psychology

The theme of this elective is man in society, his strivings, satisfactions and values. The course examines what psychology has to say about personality, the roles which people adopt, the groups people form and the nature of group relations, the effect of group interaction, the importance of attitudes, the influence of propaganda and the function of conformity, conventions and customs.

TEXT BOOKS

Baughman, E. E. and Welsh, G. S. *Personality, a Behavioural Science.* Prentice Hall, 1962.

Krech, D. and Crutchfield, R. S. *The Individual and Society.* McGraw-Hill, 1962.

26.151 Economics

An introductory examination of the working of a modern economic system, with some reference to Australian economic institutions.

TEXT BOOKS

Carter, C. F. *The Science of Wealth.* Edward Arnold, 1963.

Grant, J. McB. and Hagger, A. F. *Economics. An Australian Introduction.* F. W. Cheshire, 1964 or 1965.

26.152 Economics

Follows 26.151 Economics. A more penetrating study of central fields of economic theory and includes such topics as the history of economic thought and different economic systems. Particular attention paid to relating economic theory to such subjects as the population explosion, economic growth, and the role of international trade and economic integration. Further studies of the economic structure and economic policy of Australia.

TEXT BOOKS

Fusfeld, D. *The Age of the Economist.* Scott Foresman, 1966. Paperback.

Gill, R. F. *Evolution of Modern Economics.* Prentice-Hall, 1967. Paperback.

Samuelson, P. A. *Economics.* 7th ed., McGraw Hill. (Available in hardback and paperback.) Plus *Study Guide and Workbook to Samuelson.*

26.301 Music

A brief survey of music from the earliest times of documented history to the present day in the context of particular societies and periods. Many of the recorded examples used will be European music of a kind normally heard in the concert hall, but wherever possible European art music will be presented in juxtaposition with the practice of traditional or folk music of all continents (including the music of the Australian Aborigines) and with the high art music of Asian countries. Including continuity of improvisational methods from early periods to the development of jazz, and samples of the latest developments in contemporary music (including electronic music). Musical training is not a prerequisite.

TEXT BOOKS

Covell, R. *Australia's Music: Themes of a New Society*. Sun Books, 1967, Melbourne.
Harman, A. and Mellers, W. *Man and His Music: The Story of Musical Experience in the West*. Barrie and Rockliff, London, 1962.

REFERENCE BOOKS

Chailley, J. *40,000 Years of Music*. Macdonald, 1964, London.
Dart, T. *The Interpretation of Music*. Hutchinson, 1960, London.
Hartog, H. (ed.). *European Music in the Twentieth Century*. Penguin, 1961, London.
Lang, P. H. *Music in Western Civilisation*. Dent, 1942, London.
Mellers, W. *Music in a New Found Land*. Barrie & Rockliff, 1964, London.
Nettl, B. *Folk and Traditional Music of the Western Continents*. Prentice-Hall, 1965, New Jersey.
Sachs, C. *The Wellsprings of Music*. McGraw-Hill, 1965, New York.

26.302 Music

The history and influence of musical notation, coupled with the idea of the composer as hero. Opera from Wagner to the present day; twentieth century music from Debussy to the present day.

TEXT BOOKS

Covell, R. *Australia's Music: Themes of a New Society*. Sun Books, 1967, Melbourne.
Harman, A. and Mellers, W. *Man and His Music: The Story of Musical Experience in the West*. Barrie & Rockliff, 1962, London.

REFERENCE BOOKS

Allen, W. D. *Philosophies of Music History*. Dover, 1962, New York.
Chailley, J. *40,000 Years of Music*. Macdonald, 1964, London.
Dart, T. *The Interpretation of Music*. Hutchinson, Columbia, 1960, London.
Grout, D. J. *A Short History of Opera*. Columbia University, 1965, New York.
Hartog, H. (ed.). *European Music in the Twentieth Century*. Penguin, 1961, London.
Kerman, J. *Opera as Drama*. Vintage, 1956, New York.
Lang, P. H. *Music in Western Civilisation*. Dent, 1942, London.
Mellers, W. *Music in a New Found Land*. Barrie & Rockliff, 1964, London.
Stravinsky, Igor. *The Poetics of Music*. Vintage, 1959, New York.
Wiora, W. *The Four Ages of Music*. Norton, 1965, New York.

26.501 English

Aims at stimulating an interest in literature through a study of twentieth century texts having a more or less common theme—"the human condition". The tutorials will be used in the main for an examination of the informative, persuasive, and imaginative uses of the English language, and for group discussions of the set texts.

TEXT BOOKS

Lawrence, D. H. *Sons and Lovers*.
Malraux, A. *Man's Estate*.
Ernest Hemingway. *A Farewell to Arms*.
Albert Camus. *The Outsider*.

William Golding. *Lord of the Flies.*
Carson McCullers. *The Ballad of the Sad Café* (the ballad only).
Robert Penn Warren and Albert Erskine. *Short Story Masterpieces.*
Eugene O'Neill. *The Emperor Jones.*
Tennessee Williams. *A Streetcar Named Desire.*
Tennessee Williams. *The Glass Menagerie.*
Arthur Miller. *Death of a Salesman.*
Robert Bolt. *A Man For All Seasons.*
Three Australian Plays. Penguin.

All the texts are available in paperback editions, but any complete edition will do. *The Emperor Jones* and *The Glass Menagerie* may be available in the one paperback (Modern Library) with the title *Six Modern American Plays.*

26.502 English

Pre-requisite 26.501 or acceptable equivalent. Centred upon outstanding works of literature of the nineteenth and the twentieth centuries. Includes discussion of the sorts of pressure arising from preceding literary achievements, society and philosophical concerns, which have helped in moulding the form of each of the works and in bringing about changes of literary form.

TEXT BOOKS
Eliot, T. S. *Selected Poems.* Faber & Faber.
John Keats. *Selected Poems.* Signet Classics.

26.511 History ("The World in the 20th Century")

Consists of thirty lectures and fifteen tutorials. A general survey of the main aspects of world history in our own times. It begins with a review of a relatively settled world in which Europe is the centre, its internal balance of power still virtually intact; the British Empire is at its height; Africa and parts of Asia are divided amongst the Europeans; U.S.A. has become a great power with strategic frontiers pushed far beyond her shores; and nationalism in the Arab world has not yet awakened.

The main topics will be: the rise of Japan; the Chinese Revolution; the causes, nature and effects of the two World Wars; the Russian Revolution; the Treaty of Versailles; the League of Nations and U.N.O.; Fascism and National Socialism; America between the wars; the Cold War; Stalinism and the changing nature of Communism the twilight of Imperialism; movements towards European unity after 1945; Asian and African nationalism; and Australia's place in the modern world.

TEXT BOOKS
Crozier, Brian. *South East Asia in Turmoil.* Penguin, 1966.
FitzGerald, C. P. *The Birth of Communist China.* Penguin, 1965.
Henderson, James L. (ed.). *Since 1945, Aspects of Contemporary World History.* Methuen, 1966.
Thomson, David. *England in the Twentieth Century.* Penguin, 1965.
von Laue, T. *Why Lenin? Why Stalin? A Reappraisal of the Russian Revolution, 1900-1930.* Lippincott, New York, 1964.
Wiskemann, Elizabeth. *Europe of the Dictators, 1919-1945.* Fontana History of Europe, Collins, 1966.

26.512 History ("The World Since 1919")

Prerequisite 26.511.

A survey of events since 1919 to give an historical understanding of the world today. Its main topics are: the Peace Settlement after World War I; the growth of communist Russia; dictatorship in Europe; USA between the wars and the abandonment of isolation; an outline of World War II, its causes and effects; the cold war; the role of UNO; the changing British Commonwealth; the decline of colonialism; African nationalism; communism in China; and the place of Australia in the modern world.

REFERENCE BOOKS

Crozier, Brian. *South East Asia in Turmoil.* Penguin, 1966.
Davidson, Basil. *Which Way Africa?* Penguin.
Dulles, Foster Rhea. *America's Rise to World Power, 1898-1954.* Harper Torch book.
Henderson, J. L. *Since 1945, Aspects of Contemporary World History.* Methuen, 1966.
Sibram, Stuart. *Mao Tse Tung.* Penguin.
Snyder, L. L. *The World in the 20th Century.* Anvil Books.
von Laue, T. *Why Lenin? Why Stalin? A Reappraisal of the Russian Revolution, 1900-1930.* Lippincott, New York, 1964.
Wiskemann, Elizabeth. *Europe of the Dictators, 1919-1945.* Fontana Library.

26.521 Philosophy

An introduction to formal logic and to problems and methods of philosophy. Elementary logic is taught in tutorial classes where students are encouraged not only to understand formal features of Aristotelian and modern logic, but also to apply what they have learnt to thought and language of the everyday world. Elementary philosophy is taught by means of lectures and tutorials, and deals firstly, with the nature and methods of philosophy as contrasted with other forms of inquiry, and secondly, with some of the major problems of philosophic interest, such as the relation between language and the world; the nature of knowledge and truth; the concepts of *determinism* and *free-will*; the relation between the mental and the physical parts of Man; and the existence of God.

TEXT BOOKS

Hamblin, C. L. *Elementary Formal Logic.* Hicks Smith.
Hospers, J. *Introduction to Philosophical Analysis.* Routledge and Kegan Paul.

26.522 Philosophy

Prerequisite 26.521 Philosophy. Available in either of two forms.

Syllabus A: Contemporary Philosophy—Current trends in philosophy. Special attention is paid to techniques of philosophic scholarship, and students are required to prepare a short dissertation embodying results of original research on a subject chosen in consultation with the Department of General Studies.

TEXT BOOK

Passmore, J. A. *A Hundred Years of Philosophy*. 2nd ed., Duckworth, London, 1966.

Syllabus B: Symbolic Logic—By arrangement with the School of Philosophy, students in General Studies may take, as their advanced elective in Philosophy, a course in symbolic logic, normally offered to students of Philosophy II (Arts). Provides further training in modern logic.

TEXT BOOK

Copi, I. M. *Symbolic Logic*, 2nd ed., Macmillan, New York, 1965.

26.541 Political Science

Term I: A general introduction to Political Science, taking Miller: *The Nature of Politics* as the main text. Each lecturer deals in his own way with such general notions as the nature of politics, the scope of the study, political system, state, law, power, authority, rights, etc.

Terms II and III: These lectures deal with three political systems, Britain, Australia and the U.S.A., using them to exemplify some general questions about politics, and to bring out the variety of ways in which problems of representative government may be tackled.

The following subjects will be dealt with in such a way as to bring out their similarities and differences in the three systems under review:

Constitutions and Constitutionalism. General considerations—relation of constitutionalism to other political concepts discussed; constitutionalism and democracy; separation of powers—legislature, executive, judiciary; federal and unitary constitutions; origins and development; interpretations and amendment.

Parliamentary and Presidential Systems. Monarchy and republic; Prime Minister and President; Parliament and Congress—structure, powers, electoral processes, fixed and limited terms; the process of legislation; the formation of the executive government—Cabinet and Ministry; the bureaucracy.

Parties. The Legal status of parties; the place of parties in representative systems; party structure and organisation in the three countries; party leadership; "machine" politics; parties and democracy.

Public Opinion and Government. Discussion of the views in Birch: *Representative and Responsible Government*, especially Part I and Part V.

TEXT BOOKS

Griffith, J. *The Australian System of Government*. Uni. paperback, 1967.
Miller, J. D. B. *The Nature of Politics*. Penguin, 1966.
Moodie, G. *The Government of Britain*. Uni. paperback, 1965.
Sawer, G. *Australian Government To-day*. Melbourne, 9th ed., 1967 (paperback).

REFERENCE BOOKS

Birch, A. H. *Representative and Responsible Government: An Essay on the British Constitution*.

26.542 Political Science

This course of 60 lectures will be conducted in First and Second Terms. It will follow on directly from 26.541 (or 26.541S) with the purpose of extending the student's acquaintance with modern political systems. There will be three sections each of about 20 lectures, dealing with (a) the U.S.S.R. and the East European Peoples' Democracies; (b) two aspects of Afro-Asian political systems; (c) the international political system and some aspects of world politics.

Topics under (a) will include: the establishment and development of the Soviet system since 1917; the formal machinery of government; the Communist Party of Russia and the ruling parties of other regimes; "ideological" questions; developments in Russia and Communist block since the death of Stalin; the Sino-Soviet dispute. Under (b): theoretical concepts necessary for understanding developing societies; the role of intellectuals and other elites; study of selected countries since independence. Under (c): the development of the community of nations; the growth of international institutions and law; the nature and control of international conflict.

TEXT BOOKS

Barnett, A. D. *Communist China in Perspective.* Praeger, 1962.
Frankel, J. *International Relations.* Oxford, 1964.
Grant, Bruce. *Indonesia.* Penguin, 2nd ed., 1966.
Schapiro, L. B. *The Government and Politics of the Soviet Union.* Hutchinson, Uni. Library, 2nd ed., 1967 (paperback).
Von der Mehden, F. *Politics of the Developing Nations.* Prentice-Hall, 1964.

REFERENCE BOOKS

Crankshaw, E. *The New Cold War.* Pelican, 1963.
Deutscher, I. *Stalin.* Oxford Paperback, 1961.
Fitzgerald, C. P. *The Birth of Communist China,* Pelican, 1964.
Kochan, L. *The Making of Modern Russia.* Pelican, 1964.
Meyer, A. G. *Communism.* Random House, 2nd ed., 1963.
Mills, C. W. *The Marxists.* Pelican, 1964.
Tinker, H. *Ballot Box and Bayonet,* O.U.P., 1964.

26.561 Introduction to French Civilisation

Intensive work in the French language. Aspects of French civilisation (conducted in French). In the treatment of French cultural life, emphasis will be placed on painting and architecture.

TEXT BOOKS

Brée, G. and Dufau, M. *Voix d'aujourd'hui.* Harcourt, Brace & World.
Gerard, P. and Meras, M. *Cathédrales de France.* Fernand Nathan.
Harrap's Shorter French and English Dictionary (recommended for purchase if possible).
Michaud, G. *Guide France.* Hachette.
Politzer, R. L. and Hagiwara, M. P. *Active Review of French.* Blaisdell Publishing Co., 1963 ed.
Romier, L. *A History of France.* Macmillan, paperback ed.
Thoraval, J., et al. *Les Grandes Etapes de la Civilisation Francaise.* Bordas.

REFERENCE BOOKS

Duby, G. and Mandrou, R. *Histoire de la Civilisation Francaise.* A-Colin, Paris, edited by the Documentation Francaise.

Heron de Villefosse, R. *Paris.* Hachette.

Leroy, A. *Evolution de la Peinture Francaise des Origines à Nos Jours.* Horizons de France.

Petit Larousse, "Dictionnaire enclyclopédique pour tous". Larousse. (An invaluable reference book for civilisation as well as language.)

Read, H. *Art Now.* Faber & Faber.

Robert, P. *Le Petit Robert.* (Dictionnaire alphabétique et analogique de la langue francaise.) Société de Nouveau Lettré.

25.562/1 German Literature and Civilisation, Part 1

Conducted in English. General aspects of German civilisation, Johann Wolfgang von Goethe, *Faust I,* Thomas Mann, *Buddenbrooks,* Bertolt Brecht, *Mother Courage* and *Sezuan.*

TEXT BOOKS

Brecht, B. *Plays,* vol. II. Methuen, 1962.

Goethe, J. W. v. *Faust,* Part I. Bantam Classics (Dual Language ed.).

Mann, T. *Buddenbrooks.* Penguin (English ed.)

26.562/2 German Literature and Civilisation, Part 2

Conducted in English. General survey of German literature, Johann Wolfgang von Goethe, *Wilhelm Meister* Part I, Franz Kafka, *The Castle,* and Friedrich Dürrenmatt, *Romulus,* and Max Frisch, *The Fire Raisers.*

TEXT BOOKS

Dürrenmatt, F. *Romulus the Great.* Grove Press, 1965.

Frisch, M. *The Fire Raisers.* Methuen, 1962.

Goethe, J. W. v. *Wilhem Meister's Apprenticeship.* Collier-Macmillan, 1962.

Kafka, F. *The Castle.* Penguin (Modern Classics).

26.563/1 Spanish and Spanish-American Literature, Part 1

A selection of modern and contemporary Spanish and Spanish-American writers. While these are mostly novelists and dramatists, there is some poetry included (as in case of Lorca) where adequate translations are available.

TEXT BOOKS

Alegria, Ciro. *The Golden Serpent.* Signet.

Azuela, Mariano. *The Underdogs.* Signet.

Flores, Angel (ed.). *Great Spanish Stories.* Dell-Laurel.

Gili, J. L. (ed.). *Lorca.* The Penguin Poets.

Hortelano, Juan Garcia. *Summer Storm.* Penguin.

Jones, Willis Knapp. *Representative Plays of Florencio Sanchez.* Pan American Union.

Lorca, Federico Garcia. *Three Tragedies.* New Directions.

Resnick and Pasmantier (eds.). *An Anthology of Spanish Literature in English Translation.* Vol. II, Ungar.

REFERENCE BOOKS

Brenan, Gerald. *The Literature of the Spanish People.* Meridian Books.

Cohen, J. M. *The Penguin Book of Spanish Verse.* Penguin.

Englekirk, et al. *An Outline History of Spanish-American Literature.* Appleton-Century-Crofts.
Horig, Edwin. *Garcia Lorca.* Editions Poetry, London.
Jones, Willis Knapp. *Spanish-American Literature in Translation Since 1888.* Ungar.
Resnick and Pasmantier (eds.). *Highlights of Spanish Literature. A Bilingual Anthology.* Ungar.

26.563/2 Spanish and Spanish-American Literature, Part 2

The Medieval period in Spain, and the Colonial era in Spanish America. Emphasis is on the short story, the novel and theatre, though some great poetry is included.

TEXT BOOKS

Bentley, Eric (ed.). *The Classic Theatre.* Vol. III, Doubleday Anchor. Duplicated materials embracing a selection of Spanish-American Literature in English translation.
Cervantes. *Don Quixote.* Laurel.
Flores, Angel (ed.). *Great Spanish Short Stories.* Dell-Laurel.
Merwin, W. S. (ed.). *Poem of the Cid.* A Mentor Classic.
Resnick and Pasmantier (eds.). *An Anthology of Spanish Literature in English Translation.* Vol. I, Ungar.

REFERENCE BOOKS

Brenan, Gerald. *The Literature of the Spanish People.* Meridian Books.
Cohen, J. M. (ed.). *The Penguin Book of Spanish Verse.* Penguin.
Englekirk, et al. *An Outline History of Spanish-American Literature.* Appleton-Century-Crofts.

N.B. The book lists are subject to modification.

26.571 An Introduction to Modern Drama

This course considers various styles of drama and their methods of social and personal statement. Emphasis is on contemporary drama; but, to clarify the development of forms of dramatic expression, study is made of peak periods and styles of the past, as well as of theatre and stage design. Through critical examination of plays in performance at the Old Tote Theatre, students can enjoy direct experience of live theatre. Some use also is made of films and recordings.

TEXT BOOKS

Absurd Drama. Penguin.
Barnet (ed.). *Genius of the Early English Theatre.* Mentor.
Chekhov. *Plays.* Penguin.
Ibsen. *Last Plays* (trans. Paulson). Bantam.
New American Drama. Penguin.
Sokel (ed.). *Anthology of German Expressionist Drama.* Doubleday Anchor.
Sophocles. *Theban Plays.* Penguin.
Strindberg. *Six Plays* (trans. Sprigge). Doubleday Anchor.
Three German Plays. Penguin.
Plus other plays to be prescribed.

26.601 History of Technology

Shows that the development of the human race is closely linked with technological change. Every major development is to be seen against the historical background of the times and the changing socio-economic pattern. The subject will be dealt with in the following historical periods: Prehistoric Times; the early civilizations of Mesopotamia, Egypt, India, and China; Classical Antiquity; Islamic Times and the Middle Ages; Renaissance and the Age of Enlightenment; and the beginning of the Industrial Revolution.

TEXT BOOK

Forbes, R. J. and Dijksterhuis, E. J. *History of Science and Technology*. 2 vols., Penguin.

REFERENCE BOOK

Singer, C. and Holmyard, J. *History of Technology*. O.U.P., 1957.

26.602 History of Technology

(a) Metals in pre-historic times; metallurgy in the ancient civilisations; increased use of metals in the European Middle Ages; China discovers casting of iron; oriental steel refining methods spread to Europe. Renaissance writers on metallurgy stimulate development of ore dressing; furnace design; use of water power for blowers, rolling and drawing mills; steam engine fosters large-scale metal production. Use of mineral coal; steel making in puddle furnace, converters and open hearth processes; electro-metallurgy.

(b) Domination over matter through energy. Use of animals for traction. Vitruvius on water mills, machine tools and cranes. Windmills in Persia and China, their spread to Europe. Agricola's mining machinery, Branca's steam turbine, Huygen's gunpowder engine. Early steam engines. Stephenson's railway and Fulton's steamship. Otto's and Diesel's combustion engines. Faraday prepares for electric power. Steam turbines, gas turbines, modern water turbines. Atomic energy.

REFERENCE BOOKS

Agricola, G. *De Re Metallica* (trans. E. G. Hoover).

Forbes, R. J. *Studies in the History of Ancient Technology*. Vols. 1-10, Brill, Leyden, Holland.

Semler, E. G. (ed.). *Engineering Heritage*. 2 vols, Institute of Mechanical Engineers.

Singer, C., et al. (eds.). *A History of Technology*. 4 vols, Oxford U.P.

11.011H History of Fine Arts

An outline of the development of nineteenth and twentieth century painting and sculpture. Follows the movements concerned in the development of modern art from the stylistic background of the European tradition to contemporary works. Development of some phases of painting and sculpture during the Ancient, Medieval and Renaissance epochs. The influence of religious, economic and social factors on the more important works of the period.

TEXT BOOKS

Lake, C. and Maillard, R. *A Dictionary of Modern Painting*. Methuen, London, 1964.

Newton, E. *European Painting and Sculpture*. Penguin U.K. (Pelican Books A.82).

Read, H. *The Meaning of Art*. Penguin U.K., 1951. (Pelican Books, A213).

REFERENCE BOOKS

Berenson, B. *Italian Painters of the Renaissance.* Phaidon, London, 1952.
Brion, M. *Art Since 1945.* Thomas & Hudson, ed. London, 1959.
Burchhardt, J. *The Civilisation of the Renaissance in Italy.* Phaidon, London, 1944.
De Wald, E. T. *Italian Painting 1200-1600.* Holt, Rinehart and Winston, New York, 1962.
Gardner, H. *Art Through the Ages.* G. Bell & Sons, London, 1953.
Goldscheider, L. *The Painting and Sculpture of Michelangelo.* Phaidon, London, ca. 1960.
Mathey, F. *The World of the Impressionists.* Thomas and Hudson, London, 1961.
Ragnar, M. *Modern Painting.* Skira, 1960.
Seuphor, M. *A Dictionary of Abstract Painting.* Methuen, London, 1963.
Seuphor, M. *The Sculpture of this Century.* Zwemmer, London, 1959.
Vasari, G. *Lives of the Painters, Sculptors and Architects.* Dent and Sons, London, 1949. (Everymans Library.)
Vivas, E. and Krieger, M. *The Problems of Aesthetics.* Holt, Rinehart and Winston, New York, 1960.

Reading lists are issued progressively during the course.

11.021H History of Architecture

The role of the architect; architecture as an art, a science, and a practical profession; the origins of architectural form in ancient civilizations, and the development of these forms throughout the Middle Ages and the Renaissance; the effects of the Industrial Revolution and its aftermath, and the growth of modern architecture; the development of an Australian idiom in architecture and building.

TEXT BOOKS

Boyd, R. *The Walls Around Us.* F. W. Cheshire, Melbourne, 1962.
Pevsner, N. *An Outline of European Architecture.* Pelican Books, London, 1963.
Richards, J. M. *An Introduction to Modern Architecture.* Pelican Books, London, 1963.

REFERENCE BOOKS

A list will be issued early in the lecture series.

11.031H History of Fine Arts and Architecture

An introduction to the history and aesthetics of the visual arts of the Western world, i.e., architecture, paintings, sculpture, design and craftsmanship. Lectures are illustrated by slides and films.

TEXT AND REFERENCE BOOKS

Section I

Berenson, B. *Italian Painters of the Renaissance.* Phaidon, London, 1952.
Brion, M. *Art Since 1945.* Thomas and Hudson, London, 1959.
Burchhardt, J. *The Civilisation of the Renaissance in Italy.* Phaidon, London, 1944.
De Wald, E. T. *Italian Painting 1200-1600.* Holt, Rinehart and Winston, New York, 1962.
Gardner, H. *Art Through the Ages.* G. Bell & Sons, London, 1953.
Goldscheider, L. *The Painting and Sculpture of Michelangelo.* Phaidon, London, ca. 1960.

Lake, C. and Maillard, R. *A Dictionary of Modern Painting*. Methuen, London, 1964.
Mathey, F. *The World of the Impressionists*. Thomas and Hudson, London, 1961.
Newton, E. *European Painting and Sculpture*. Penguin. (Pelican Books A82.)
Ragnar, M. *Modern Painting*. Skira, 1960.
Read, H. *The Meaning of Art*. Penguin 1951. (Pelican Books A213.)
Seuphor, M. *A Dictionary of Abstract Painting*. Methuen, London, 1963.
Seuphor, M. *The Sculpture of this Century*. Zwemmer, London, 1959.
Vasari, G. *Lives of the Painters, Sculptors and Architects*. Dent and Sons, London, 1949. (Everymans Library.)
Vivas, E. and Krieger, M. *The Problems of Aesthetics*. Holt, Rinehart and Winston, New York, 1960.

Section II

Boyd, R. *The Walls Around Us*. F. W. Cheshire, Melbourne, 1962.
Pevsner, N. *An Outline of European Architecture*. Pelican Books, 1963.
Richards, J. M. *An Introduction to Modern Architecture*. Pelican Books, London, 1963.

SUBSTITUTION OF ARTS SUBJECTS FOR HUMANITIES SUBJECTS

In fulfilment of the Humanities requirements, and provided timetables and other circumstances permit, students in Faculties other than Arts may substitute certain Arts subjects for the prescribed Humanities subjects. Since Arts courses are conducted on a full-time basis, this provision will normally apply to full-time students only.

The manner in which substitution of Arts subjects may be effected is set out below.

Subject to the rules listed below, a student may, with the approval of the Head of the School offering the subject, substitute one of the Arts subjects listed for 90 hours of General Studies or two of these subjects for 180 hours of General Studies.

GROUP A

(i) General Studies Subjects

26.501	English
26.502	English
26.561	French
26.562/1	German Literature and Civilisation, Part 1
26.562/2	German Literature and Civilisation, Part 2
26.563/1	Spanish and South American Literature, Part 1
26.563/2	Spanish and South American Literature, Part 2
26.571	Drama

GROUP B

(i) General Studies Subjects

11.011H	History of Fine Art
11.021H	History of Architecture
11.031H	History of Fine Art and Architecture
26.121	Psychology
26.122	Psychology
26.151	Economics
26.152	Economics
26.301	Music
26.302	Music
26.511	History
26.512	History
26.521	Philosophy
26.522	Philosophy
26.541	Political Science
26.542	Political Science
26.601	History of Technology
26.602	History of Technology

(ii) Arts Subjects

50.111	English
56.111	French
56.201	German IZ*
56.211	German I
56.301	Spanish IZ*
56.311	Spanish I
57.211	Drama I

(ii) Arts Subjects

12.011	Psychology I
15.101	Economics I
51.111	History I
52.111	Philosophy I
53.111	Sociology I
54.111	Political Science I

*Students who have passed in German or Spanish at Matriculation level are not permitted to enrol in Course IZ in that subject.

Rule 1: A student must include in his General Studies programme at least one subject from each of the Groups A and B.

Rule 2: A student may not count in his General Studies programme both a General Studies subject and the corresponding Arts subject.

Rule 3: A student may not substitute an Arts subject for one or more General Studies subjects, if the Arts subject or a similar subject forms part of the normal programme in the degree course in which he is enrolled.

THE SCIENCE COURSE

Various arrangements of this course are available to students wishing to specialise in subjects offered by the relevant Schools. No concurrent industrial experience is required.

All subjects are available for study during the day, and most during the evening sessions.

A pass degree may be awarded after three years' full-time study and an honours degree after four years' full-time study. The normal time for a course leading to a pass degree by part-time study is seven years with an additional year full-time, or two years part-time, for a course leading to an honours degree. Some subject groupings cannot be completed in the minimum time due to the exigencies of the timetable.

Progression in the Science Course is normally permitted by subjects (but see Clause 2e below).

Any arrangements of subjects to be studied under these regulations must be approved by the Dean of the Faculty and the advice of his representative must be sought*. A student who intends to seek admission to an Honours Course should consult the Head of the appropriate School on completion of the first year subjects. The normal requirements for admission to Honours studies in Schools of the Faculty may be found under the description of the courses offered by these Schools as set out below.

REGULATIONS GOVERNING THE SCIENCE COURSE

1. A student is required to select his course from the following groups of qualifying subjects in accordance with the provisions set out in subsequent clauses.†

Students should note that some Group I, Group II and Group III subjects are offered at two or three different levels, and that each level of a subject may differ in its adequacy and acceptability

* A table of recommended patterns of subjects is given below.

† A student who selects an unusual combination of subjects, or selects subjects from more than one group in one year, may be required, owing to the exigencies of the timetable, to attend for more than the minimum number of years (this may sometimes be avoided by attendance at night classes).

as a co-requisite or pre-requisite for other subjects or level of a subject.

Students commencing their course and intending to study any of Chemistry, Mathematics (compulsory), and Physics, should be aware of the need to select the subject level which is appropriate to, and adequate for, the study of other subjects which are taken concurrently or are to be taken in a subsequent year.

Details of approved first-year programmes and of pre-requisites and co-requisites are given under Clauses 3 and 4 respectively.

		Term 1 Lec. Lab./ Tut.	Term 2 Lec. Lab./ Tut.	Term 3 Lec. Lab./ Tut.
(A) General Studies				
(i) *One* of the following:				
26.501	English *or*			
26.571	An Introduction to Modern Drama	1 — ½	1 — ½	1 — ½
(ii) *Two* of the following:				
11.011H	History of Fine Arts			
11.021H	History of Architecture			
26.121	Psychology			
26.151	Economics			
26.301	Music			
26.511	History			
26.521	Philosophy	1 — ½	1 — ½	1 — ½
26.531	Sociology			
26.541	Political Science			
26.562/1	German Literature and Civilisation, Part 1			
26.562/2	German Literature and Civilisation, Part 2			
26.601	History of Technology			
Additional for an Honours Degree—				
	Advanced General Studies Elective	2 — 0	2 — 0	2 — 0
(B) Science Subjects—				
Group I—				
1.001	Physics I *or*	3 — 3	3 — 3	3 — 3
1.011	Higher Physics I *or*	3 — 3	3 — 3	3 — 3
1.041	Physics IC	3 — 3	3 — 3	3 — 3
2.001	Chemistry I *or*	2 — 4	2 — 4	2 — 4
2.011	Higher Chemistry I	2 — 4	2 — 4	2 — 4
5.001	Engineering I	6	6	6
10.001	Mathematics I *or*	4 — 2	4 — 2	4 — 2
10.011	Higher Mathematics I *or*	4 — 2	4 — 2	4 — 2
10.021	Mathematics IT	4 — 2	4 — 2	4 — 2
12.001	Psychology I	3 — 2	3 — 2	3 — 2
17.001	General and Human Biology	3 — 3	3 — 3	3 — 3

		Term 1 Lec. Lab./ Tut.	Term 2 Lec. Lab./ Tut.	Term 3 Lec. Lab./ Tut.
25.001	Geology I*	2 — 4	2 — 4	2 — 4
27.031	Geography IS	2 — 4	2 — 4	2 — 4
52.111	Philosophy I	4	4	4
Group II—				
1.112	Physics II	4 — 4	4 — 4	4 — 4
2.002	Chemistry II	4 — 5	4 — 5	4 — 5
10.111	Pure Mathematics II	3 — 2	3 — 2	3 — 2
10.211	Applied Mathematics II	3 — 4	3 — 4	3 — 4
10.121	Pure Mathematics II (Higher)	6 — 0	6 — 0	6 — 0
10.221	Applied Mathematics II (Higher)	4 — 1	4 — 1	4 — 1
10.111W‡	Pure Mathematics IIW	5	5	5
10.211W‡	Applied Mathematics IIW	7	7	7
10.121W‡	Pure Mathematics IIW (Higher)	6	6	6
10.221W‡	Applied Mathematics IIW (Higher)	7	7	7
10.411W‡	Mathematics IIW	7	7	7
10.311	Theory of Statistics I	4 — 3	4 — 3	4 — 3
10.321	Theory of Statistics I (Higher)	5 — 3	5 — 3	5 — 3
12.012	Psychology II	3 — 5	3 — 5	3 — 5
17.101	Biochemistry I	3 — 6	3 — 6	3 — 6
17.301	Botany I	3 — 6	3 — 6	3 — 6
17.401	Zoology I	3 — 6	3 — 6	3 — 6
25.002	Geology II*	4 — 5	4 — 5	4 — 5
73.011	Physiology I	3 — 6	3 — 6	3 — 6
Group III—	*Part (a)*—			
1.113	Physics III	4 — 8	4 — 8	4 — 8
2.003	Chemistry III	4 — 10	4 — 10	4 — 10
10.112	Pure Mathematics III	4 — 1	4 — 1	4 — 1
10.122	Pure Mathematics III (Higher)	6 — 1	6 — 1	6 — 1
10.212	Applied Mathematics III	3 — 4	3 — 4	3 — 4
10.222	Applied Mathematics III (Higher)	5 — 3	5 — 3	5 — 3
10.112W	Pure Mathematics IIIW	5	5	5
10.122W	Pure Mathematics IIIW (Higher)	7	7	7
10.212W	Applied Mathematics IIIW	7	7	7
10.222W	Applied Mathematics IIIW (Higher)	8	8	8
10.412W	Mathematics IIIW	7	7	7
12.013	Psychology III†	4 — 5	4 — 5	4 — 5

* Field tutorials are an essential component of these courses.

‡ The Suffix "W" indicates a subject offered only at Wollongong University College.

† Students are required to undertake such additional field work and clinical studies, averaging two hours per week, as may be prescribed by the Head of the School of Applied Psychology.

17.102	Biochemistry II	3 — 10	3 — 10	3 — 10
17.201	Microbiology I	4 — 8	4 — 8	4 — 8
17.302	Botany II	3 — 10	3 — 10	3 — 10
17.402	Zoology II	4 — 9	4 — 9	4 — 9
17.501	Entomology I	4 — 9	4 — 9	4 — 9
25.003	Geology III*	7 — 6	7 — 7	6 — 6
73.012	Physiology II	3 — 9	4 — 10	4 — 10
Part (b)—				
1.133	Mathematical Physics	5 — 1	5 — 1	5 — 1
2.053	Chemistry III (Supplementary)	3 — 7	2 — 8	2 — 8
6.065	Computer Science	4 — 5	4 — 5	4 — 5
10.312	Theory of Statistics II	4 — 4	4 — 4	4 — 4
10.322	Theory of Statistics II (Higher)	5 — 4	5 — 4	5 — 4
12.044	Psychology III (Supplementary)†	3 — 5	3 — 5	3 — 5
25.013	Geology III (Supplementary)*	4 — 8	4 — 8	4 — 8

* and † see footnotes on previous page.

2. (*a*) In order to qualify for admission to the degree of Bachelor of Science under these regulations a candidate must attend the classes and satisfy the examiners in the following subjects:—

(i) the General Studies subjects listed under section 1 (A),

(ii) nine Science subjects selected from the list in section 1 (B).

(*b*) The proposed course must be approved by the Dean of the Faculty of Science or his representative during enrolment. In special circumstances, the Dean may grant the student permission to defer enrolment in one of the Group I subjects until the second year of the course. Where any alteration in the course approved at enrolment is desired, the student must obtain the approval of the Dean or his representative for the new course.

(*c*) The nine Science subjects must include:—

(i) The appropriate one of 10.001 Mathematics I, 10.011 Higher Mathematics I, or 10.021 Mathematics IT.

(ii) At least three and not more than four other subjects from Group I.

(iii) At least one subject from Group III, Part (*a*).

(*d*) No more than one subject from each of the following groups of subjects may be chosen:—

(i) Pure Mathematics II; Pure Mathematics II (Higher); Pure Mathematics IIW; Pure Mathematics IIW (Higher); Mathematics IIW.

(ii) Applied Mathematics II; Applied Mathematics II (Higher); Applied Mathematics IIW; Applied Mathematics IIW (Higher); Mathematics IIW.

(iii) Pure Mathematics III; Pure Mathematics III (Higher); Pure Mathematics IIIW; Pure Mathematics IIIW (Higher); Mathematics IIIW.

(iv) Applied Mathematics III; Applied Mathematics III (Higher); Applied Mathematics IIIW; Applied Mathematics IIIW (Higher); Mathematics IIIW.

(v) Theory of Statistics I; Theory of Statistics I (Higher).

(vi) Theory of Statistics II: Theory of Statistics II (Higher).

(vii) Psychology I; Psychology (General Studies Elective).

(*e*) A full-time student is required to complete the appropriate Group I Mathematics and three other approved Group I subjects in the first two years of attendance or else show cause to the satisfaction of the Professorial Board why he should be allowed to re-enrol. The remaining subjects of the course may be completed in any order consistent with the requirements concerning pre-requisite and co-requisite subjects as set out in Section 4.

3. In general a full-time student should complete his course as follows:—

First Year—

(A) The subjects chosen in this year will depend on the subjects which a student plans to study in subsequent years. The appropriate Group I Mathematics must be taken by all students and the remaining three subjects to be taken are as specified below:

(a) *School of Applied Psychology.* 10.001, 10.011 or 10.021 Mathematics, 12.001 Psychology and two other Group I subjects.

(b) *School of Biological Sciences.* 10.001, 10.011 or 10.021 Mathematics, 17.001 General and Human Biology, 2.001 or 2.011 Chemistry, 1.001 or 1.011 or 1.041 Physics; except that with the consent of the Head of the School of Biological Sciences, and in special circumstances, Physics may be deferred to second year and 25.001 Geology taken in lieu in first year. In this case credit will not be given for any Group II Biology subjects until Physics I is completed.

(c) *School of Chemistry.* 10.001, 10.011 or 10.021 Mathematics, 2.001 or 2.011 Chemistry, 1.001, 1.011 or 1.041 Physics and one other Group I subject.

(d) *School of Mathematics.* 10.001, 10.011 Mathematics and three other Group I subjects except that 1.001, 1.011 or 1.041 Physics must be completed before a student enters either level of Applied Mathematics II.

(e) *School of Physics.* 10.001 or 10.011 Mathematics, 1.001 or 1.011 Physics, and two other Group I subjects. A student is usually expected to complete 2.001 or 2.011 Chemistry in his course.

(f) A student may take a degree under these regulations with a major sequence of subjects in the School of Applied Geology or in the School of Physiology:

(i) *School of Applied Geology.* 10.001, 10.011 or 10.021 Mathematics, 1.001, 1.011 or 1.041 Physics, 2.001 or 2.011 Chemistry and 25.001 Geology.

(ii) *School of Physiology.* 10.001, 10.011 or 10.021 Mathematics, 1.001, 1.011 or 1.041 Physics; 2.001 or 2.011 Chemistry and 17.001 General and Human Biology.

(B) When choosing the level to be studied in a first year subject a student must note that:—

(a) Completion of 10.021 Mathematics IT will not qualify for admission to a major sequence of subjects in the School of Mathematics. A pass at credit standard or better in 10.021 Mathematics IT will qualify for entry to Theory of Statistics I but will not qualify for progression to Theory of Statistics II subsequently.

(b) Completion of 1.041 Physics IC will not normally qualify for admission to 1.112 Physics II. However students who achieve a superior pass in 1.041 Physics IC may apply to the Head of the School of Physics for permission to enter 1.112 Physics II.

(c) Completion of 10.001 Mathematics will not qualify for admission to any Group II Mathematics subject at the higher level.

Second Year—

(A) English *or* An Introduction to Modern Drama.

(B) Three subjects from Group II,
or two subjects from Group II and one from Group I.

Third Year—

(A) Two General Studies Electives,

(B) Two subjects from Group III, Part (*a*),
or one subject from Group III, Part (*a*) and one from Group III, Part (*b*),
or one subject from Group III, Part (*a*) and one from Group II.

In particular cases, however, the Head of the Department of General Studies has discretion to vary the order in which the General Studies subjects are taken.

4. *Pre-requisites and Co-requisites*

(*a*) Before enrolling for any subject listed in Group II the student shall have attended the classes and satisfied the examiners in the corresponding subject in Group I at the appropriate level, and before enrolling for any subject listed in Group III, the student shall have attended classes and satisfied the examiners in the corresponding subject listed in Group II.

(*b*) Before enrolling in any subject listed in the left-hand column below, the student shall have attended the classes and satisfied the examiners in the subjects stated as pre-requisites in the right-hand column.

Subject	*Pre-requisite/s*
Group II—	
Physics II	10.001 Mathematics I *or* 10.011 Higher Mathematics I
Biochemistry I	*†1.001 Physics I *or* 1.011 Higher Physics I *or* 1.041 Physics IC
Botany I	*2.001 Chemistry I *or* 2.011 Higher Chemistry I
Zoology I	*10.001 Mathematics I *or* 10.011 Higher Mathematics I *or* 10.021 Mathematics IT
	17.001 General and Human Biology
Physiology I	1.001 Physics I *or* 1.011 Higher Physics I *or* 1.041 Physics IC
	2.001 Chemistry I *or* 2.011 Higher Chemistry I
	10.021 Mathematics IT
	17.001 General and Human Biology

* A student failing to pass these subjects should seek the advice of the Dean's representative about beginning Group II Biology subjects.

† See 3A(b).

Subject	*Pre-requisite/s*
Pure Mathematics II (Higher)	10.011 Higher Mathematics I
Pure Mathematics II	10.001 Mathematics I *or* 10.011 Higher Mathematics I
Applied Mathematics II (Higher)	10.011 Higher Mathematics I *and* 1.001 Physics I *or* 1.011 Higher Physics I *or* 1.041 Physics IC
Applied Mathematics II	10.001 Mathematics I *or* 10.011 Higher Mathematics I *and* 1.001 Physics I *or* 1.011 Higher Physics I *or* 1.041 Physics IC
Theory of Statistics I — either level	10.001 Mathematics I *or* 10.011 Higher Mathematics I (*or* 10.021 Mathematics IT at Credit standard or better)
Group III—	
Physics III	Pure Mathematics II — either level *or* Pure Mathematics IIW — either level, *or* Mathematics IIW
Botany II	Biochemistry I *or* one of the Group II subjects offered by the Schools of Chemistry, Mathematics or Physics
Zoology II	Biochemistry I *or* Chemistry II
Microbiology I	*Either* Biochemistry I, *or* Chemistry II *and* General and Human Biology
Biochemistry II	Chemistry II
Theory of Statistics II — either level	Pure Mathematics II — either level, *or* Pure Mathematics IIW — either level
Pure Mathematics III (Higher)	Pure Mathematics II (Higher) *and* one other Group II subject of the School of Mathematics
Mathematical Physics	Pure Mathematics II *and* Physics II
Entomology I	Zoology I *and either* Chemistry II or Biochemistry I
Physiology II	Biochemistry I*

* In exceptional cases, *either* Physics II *or* Chemistry II may be substituted.

Geology III	1.001 Physics I *or* 1.011 Higher Physics I *or* 1.041 Physics IC
Computer Science	Pure Mathematics II *or* Applied Mathematics II *or* Theory of Statistics I *or* Physics II

(*c*) Enrolment in the subject in the left-hand column shall not be approved unless the corresponding subject or subjects listed in the right-hand column are taken concurrently or have been completed.

Subject	*Co-requisite/s*
Group II—	
Applied Mathematics II—either level	Pure Mathematics II —either level, *or*
Applied Mathematics IIW—either level	Pure Mathematics IIW —either level
Group III—	
Chemistry III (Supplementary)	Chemistry III
Theory of Statistics II —either level	Pure Mathematics III —either level, *or* Pure Mathematics IIIW —either level
Geology III (Supplementary)	Geology III
Mathematical Physics	Physics III
Psychology III (Supplementary)	Psychology III

The Dean of the Faculty has the power to vary in exceptional cases the pre-requisites and/or co-requisites set down above on the recommendation of the Head of the appropriate school.

Part-time Study

5. For part-time as for full-time students subjects are offered as whole units, with the exception of Physics III and Mathematical Physics. These two subjects from Group III are still offered in sections during the evening, and the hours per week allocated to them are shown below:—

Group III—

		Hours per week for 30 weeks			
		Lec.	Lab./Tut.		Lec. Lab./Tut.
Physics III	Part I	2	— 4	Part II	2 — 4
Mathematical Physics	Part I	2½	— ½	Part II	2½ — ½

6. A part-time student must select his subjects in compliance with the regulations set out above for full-time students. However, a part-time student is required to complete the appropriate Group I Mathematics and three other approved Group I subjects in the first four years of enrolment.

Honours Course

7. (*a*) A suitably qualified candidate may be admitted to an honours course in one of the following subjects. An extra year of full-time work, or two extra years of part-time work, is required.

(i) Biochemistry
(ii) Botany
(iii) Chemistry
(iv) Computer Science
(v) Entomology
(vi) Geology
(vii) Mathematics (Pure or Applied)
(viii) Microbiology
(ix) Physics
(x) Physiology
(xi) Psychology
(xii) Theory of Statistics
(xiii) Zoology

(*b*) A student desiring admission to the honours course must apply to the Head of the appropriate School in accordance with the requirements set out under the section entitled "Requirements for Honours in the Science Course", or, where no specific date is given, on completion of the pass degree requirements.

(*c*) A student proceeding to honours in any School must attend lectures, read and engage in laboratory work as may be required by the Head of the School.

The special requirements for admission to the honours course in each of the above subjects are set out later under the section entitled "Requirements for Honours in the Science Course".

Advanced Standing in the Science Course for Engineering Students Proceeding to the Double Degree — B.Sc/B.E.

A student who has satisfied the examiners in the first two years of an Engineering course, including Physics II and Mathematics II as prescribed for the Electrical Engineering course, may be admitted to the Science degree with advanced standing.

Such student shall be required to complete the appropriate General Studies and three Science course subjects in accordance with the regulations, except that he may qualify for a pass B.Sc. by completing *two* Group III subjects.

RECOMMENDED PATTERNS OF SUBJECTS IN THE SCIENCE COURSE

The following information relates to courses in which first enrolment took place *before* 1968.

Students enrolling in Year I in 1968, should refer to the list of pre-requisite subjects (set out in the Science Course regulations) for guidance in the choice of first-year courses.

Chemistry Courses*

The recommended patterns of courses for a Chemistry major are:

COURSE I

Year I	*Year II*	*Year III*
Chemistry I	Chemistry II	Chemistry III
Physics I	Physics II	Chemistry III
Mathematics I	Pure Mathematics II	(Supplementary)
Geology I		
or Psychology I		
or General & Human Biology		
or Engineering I		
or Geography I		

COURSE II

Year I	*Year II*	*Year III*
Chemistry I	Chemistry II	Chemistry III
Physics I	Biochemistry I	Chemistry III
Mathematics I	Botany I	(Supplementary)
General & Human Biology		

In addition, several variants are possible in second year, and Biochemistry II *or* Pure Maths. III, etc., can replace Chemistry III (Supplementary) in third year.

Physics Courses

The recommended patterns of courses for a Physics major are:

Year I	*Year II*	*Year III*
Chemistry I	Physics II	Physics III
Physics I	Pure Mathematics II	Mathematical Physics
Mathematics I	Chemistry II	*or* Pure Mathematics III
Geology I	*or* Theory of	
or Psychology I	Statistics I	
or General & Human Biology	*or* Applied Mathematics II	
or Engineering I		
or Geography I		

* Students wishing to take Chemistry as a major subject may alternatively take the Applied Chemistry Course which also leads to a B.Sc. degree. All students proposing to major in Chemistry should read the section under "School of Chemistry", which will assist them in determining the most appropriate course.

The Biological Sciences

The recommended patterns of courses for a major in one of the Biological Sciences are:

(a) Biochemistry

COURSE I

Year I	*Year II*	*Year III*
Chemistry I	Biochemistry I	Biochemistry II
Physics I	Chemistry II	Chemistry III
Mathematics I	Botany I	
General & Human Biology		

COURSE II

Year I	*Year II*	*Year III*
As above	Biochemistry I	Biochemistry II
	Chemistry II	Chemistry III
	Zoology I	

(b) Microbiology

COURSE I

Year I	*Year II*	*Year III*
As above	Biochemistry I	Microbiology I
	Chemistry II	Biochemistry II
	Botany I	

COURSE II

Year I	*Year II*	*Year III*
As above	Biochemistry I	Botany II
	Chemistry II	Microbiology I
	Botany I	

(c) Botany

COURSE I

Year I	*Year II*	*Year III*
As above	Botany I	Botany II
	Biochemistry I	Biochemistry II
	Chemistry II	

COURSE II

Year I	*Year II*	*Year III*
As above	As above	Botany II
		Microbiology I

COURSE III

Year I	*Year II*	*Year III*
As above	As above	Botany II
		Chemistry III

(d) Zoology

COURSE I

Year I	*Year II*	*Year III*
As above	Zoology I	Zoology II
	Biochemistry I	Biochemistry II
	Chemistry II	

COURSE II

Year I	*Year II*	*Year III*
As above	Zoology I	Zoology II
	Biochemistry I	Botany II
	Botany I	

(e) Entomology

COURSE I

Year I	*Year II*	*Year III*
As above	Zoology I	Entomology I
	Biochemistry I	Biochemistry II
	Chemistry II	

COURSE II

Year I	*Year II*	*Year III*
As above	Zoology I	Zoology II
	Biochemistry I	Entomology I
	Botany I	

Mathematics Courses*

Following are recommended patterns of courses for students taking mathematics as their major subject:

COURSE I

Chemistry I	Pure Mathematics II	Pure Mathematics III
Physics I	Applied Mathematics II	Applied Mathematics III
Mathematics I	Theory of Statistics I	*or* Theory of Statistics II
Geology I		
or Psychology I		
or General & Human Biology		
or Engineering I		
or Geography I		

COURSE II

Chemistry I	Pure Mathematics II	Pure Mathematics III
Physics I	Applied Mathematics II	Applied Mathematics III
Mathematics I	Physics II	*or* Theory of Statistics I
Geology I		
or Psychology I		
or General & Human Biology		
or Engineering I		
or Geography I		

COURSE III

Chemistry I	Pure Mathematics II	Pure Mathematics III
Physics I	Physics II	Theory of Statistics II
Mathematics I	Theory of Statistics I	*or* Applied Mathematics II
Geology I		
or Psychology I		
or General & Human Biology		
or Engineering I		
or Geography I		

* Students intending to take Applied Mathematics III are strongly advised to include Physics II in the course pattern selected.

COURSE IV

Chemistry I	Pure Mathematics II	Pure Mathematics III
Physics I	Applied Mathematics II	Physics III
Mathematics I	Physics II	
Geology I		
or Psychology I		
or General & Human Biology		
or Engineering I		
or Geography I		

Courses III and IV are also recommended by the School of Physics.

Geology Courses

The recommended patterns of courses for a Geology major are:

Year I	*Year II*	*Year III*
Chemistry I	Geology II *and* any two (2) of the following:	Geology III *and* any one (1) of the following:
Physics I	Physics II	Geology III (S)
Mathematics I	Pure Mathematics II	Physics III
Geology I	Chemistry II	Chemistry III*

* Chemistry III will require some practical work outside the normal day course.

Psychology Courses

The recommended patterns of courses for a Psychology major are:

COURSE I

Year I	*Year II*	*Year III*
Chemistry I	Psychology II	Psychology III
Physics I	Pure Mathematics II	Theory of Statistics I
Mathematics I	General & Human Biology	
Psychology I		

COURSE II

Year I	*Year II*	*Year III*
Chemistry I	Psychology II	Psychology III
Physics I	Chemistry II	Zoology I
Mathematics I	General & Human Biology	
Psychology I		

COURSE III

Year I	*Year II*	*Year III*
Chemistry I	Psychology II	Psychology III
Physics I	General & Human Biology	Psychology III (Supplementary)
Mathematics I	and *one* of the following:	
Psychology I	Pure Mathematics II	
	Chemistry II	
	Physics II	

Physiology Courses

The recommended pattern of courses for a Physiology major is:

Year I	*Year II*	*Year III*
Physics I	Physiology I	Physiology II
Chemistry I	Biochemistry I	Biochemistry II
Mathematics I	and	*or* Zoology II
General & Human	Zoology I	
Biology	*or* Chemistry II*	

* Students may also choose Physics II, but *before* enrolling in the subject, they *must* discuss their choice with a representative of the School of Physiology.

REQUIREMENTS FOR HONOURS IN THE SCIENCE COURSE

Biochemistry, Botany, Entomology, Microbiology, Zoology

Students may read for Honours in the School of Biological Sciences in the subjects of Botany, Zoology, Entomology, Biochemistry and Microbiology. Students wishing to do so must apply to the Head of the School not later than 31st December of the year in which the third year of the full-time course is completed. A student who is admitted to Honours study should have achieved a generally high standard throughout the course and must have majored in the particular discipline in which the study is to be carried out.

It is desirable, but not imperative, for a student to decide as early as possible that he wants to do Honours and should consult appropriate members of the staff for advice on the best course structure for his particular interests.

Honours courses will include research work, lectures and seminars, advanced reading and such additional work as may be prescribed by the Head of the School.

Chemistry

Students desiring admission to the Honours course must apply in writing to the Head of the School not later than November 30 of the year in which the third year of the full-time (sixth stage of the part-time) course is completed.

For admission to the Honours Chemistry Course in Science, the applicant must have passed Chemistry III and one other group three subject and have a good academic record before admission will be approved. Students who at the beginning of their third year are already interested in taking Honours in Chemistry

are advised to seek guidance from the School about the most appropriate subject to accompany Chemistry III. Generally it is desirable, though not essential, that a student should have taken both Chemistry III and Chemistry III (Supplementary) in the final year.

The major part of the work for Honours will consist of a research project which may be undertaken in any one of the six departments by arrangement with the Head of the School. Honours will, however, not be awarded in any particular branch of the subject but in the subject as a whole. Attendance will be required at such lectures and seminars as the Head of the School directs.

Computer Science

Students of sufficient merit who have completed the course in Computer Science (6.065) may be admitted to the honours course in fourth year. Permission to enter the course is granted by the Head of the Department of Electronic Computation, School of Electrical Engineering, and normally requires completion of Mathematics III (Pure or Applied).

The course will consist of prescribed lectures, seminars and reading in the areas of mathematical theory of computation, computer applications, computer logic and organization. This includes such topics as automata theory, formal languages, logic, numerical analysis, computer simulation, artificial intelligence, advanced logical design and programming systems. A candidate will be required to participate in a research project of the Department, and may also be required to attend selected courses in other Departments/Schools.

Geology

Students in the Faculty of Science who have completed the two third year Geology subjects, in the case of full-time students, or the course requirements up to the end of the sixth year and whose programme includes the two third year geology subjects, in the case of part-time students, may apply to the Head of the School of Applied Geology to read for an Honours Degree in Geology. Students who have majored in *either* Physics and Geology *or* Chemistry and Geology may also be admitted with a view to studies in geophysics *or* geochemistry respectively.

The Honours course will consist of a short field assignment with appropriate work in the laboratory on material collected. The results of both the field and laboratory investigations to be

presented in a graduation thesis. Advanced lectures, practical work and seminars. Short laboratory assignments on specific problems may be given. Further details of the Honours course may be had from the Head of School.

Full-time students will cover the work in the fourth year of the course. Part-time students will be required to commence their field thesis work at the end of the sixth year of their course and advanced laboratory assignments will be done in the eighth year along with the further work necessary to complete their graduation (field) thesis work.

It may be stated in addition, that students seeking to do Honours in Geology will have to satisfy the Head of the School that they have attained a sufficient standard in their pass course work as to indicate their ability to undertake geological studies at a more advanced level.

Mathematics and Theory of Statistics

There are three different fourth year Honours courses in the School of Mathematics, namely, Pure Mathematics, Applied Mathematics and the Theory of Statistics.

1. Permission must be obtained to enter the fourth year course in Pure Mathematics. Such permission will not usually be granted unless the applicant has passed in Pure Mathematics III (Higher).
2. Permission must be obtained to enter the fourth year course in Applied Mathematics. Such permission will not usually be granted unless the applicant has passed in Applied Mathematics III (Higher).
3. Permission must be obtained to enter the fourth year course in the Theory of Statistics. Such permission will not usually be granted unless the applicant has passed in Theory of Statistics II (Higher) and Pure Mathematics III.

Physics

Students wishing to read for Honours in Physics must complete the major sequence, Physics I, Physics II and Physics III, and for acceptance into the Honours course will be expected to have attained a majority of graded passes ("Credit" or "Distinction") in these subjects. Adequate supporting performance in mathem-

atical subjects will also be expected. In preparation for the Honours year, students would normally be expected to take the subjects Physics III and Mathematical Physics in their third year.

Intending candidates for Honours should apply to the Head of the School not later than December 31 in the year in which the third year is completed.

Physiology

Students wishing to do an Honours year in Physiology should consult the Head of the School while they are doing Physiology II in the third year of their course—as early in the year as possible but certainly not later than the beginning of the third term.

The requirement for admission to the Honours course is a good academic record during the pass degree course.

The Honours course will include advanced training in experimental physiology and participation in one of the research projects of the School.

Psychology

A student wishing to proceed to Honours in Psychology must have completed three full-time or five part-time years of psychology in his pass degree course, and have obtained at least Credit standard in Psychology II and Psychology III in order to be admitted to Honours study.

SCHOOL OF APPLIED PSYCHOLOGY

The study of psychology as a formal discipline in undergraduate courses is traditional in Australian Universities. Psychology as a subject is concerned with the systematic study of human behaviour, and includes historical, experimental and descriptive features. The School of Applied Psychology offers psychology as a major subject in the full-time Arts Course and in the full-time and part-time Science and Commerce Courses. It also offers a full-time and a part-time undergraduate professional degree course in Applied Psychology.

In the Science course, Psychology I, II and III and Psychology III (Supplementary) may be studied subject to the Science course regulations, and a student who wishes to proceed to honours in the subject must have completed three full courses of psychology in his pass degree and must have obtained at least credit in Psychology II and III in order to be admitted to the honours year.

The course leading to the degree of Bachelor of Science (Applied Psychology) is designed as a professional undergraduate course for the training of psychologists. It may be taken as a full-time or as a part-time course, the full-time course over four years and the part-time course over a minimum of six years. This course has been introduced in order to meet the increasing demands of professional psychologists in the various fields of applied psychology. Two main fields of specialisation will be developed—Industrial and Clinical, and students in their fourth year will choose between these two areas of specialisation.

APPLIED PSYCHOLOGY COURSES

The B.Sc. (Applied Psychology) course is offered on a full-time (four years) or on a part-time (six years) basis at pass or honours level with electives in industrial or clinical psychology. For students who commenced before 1963 the old part-time courses of five years (pass) or six years (honours) will continue to operate.

The new courses provide a firm background of psychological theory and of such other sciences as are required for further study (e.g., mathematics and biology), together with a leavening of the Humanities. The later years of the courses lead to increasing specialisation in either industrial psychology or clinical psychology.

The elective in industrial psychology is intended to meet the demand for students who will engage in personnel work in industry. It involves a study of the individual worker and the organisations in which he works and embraces such aspects of this study as job success and failure, job satisfaction and dissatisfaction, industrial motivation, employer-employee relations, acquisition of job skill, conditions affecting job efficiency and the like. These will be the subject of both theoretical and practical work.

The elective in clinical psychology includes basic theoretical and practical training in some of the more common areas of clinical psychology. The various aspects of the specialisation will be concerned with professional training in the diagnosis and assessment of personality and behaviour disorders and their treatment in various fields of counselling. Training is given in case studies and in preventive and therapeutic team work, and research in clinical psychology is also covered.

Details follow for all years of the new full-time and part-time courses. Honours are awarded on the quality of the work performed throughout the course.

APPLIED PSYCHOLOGY—FULL-TIME COURSE

Bachelor of Science

First Year

(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
10.001 10.011 10.021	Mathematics I *or* Higher Mathematics I *or* Mathematics IT	4 — 2
12.001	Psychology I	3 — 2
17.001	General and Human Biology	2 — 4
53.111	Sociology I *or*	4 — 0
62.111	History and Philosophy of Science	3 — 1
		13/12 — 9/8

SECOND YEAR
(30 weeks' day course)

		Hours per week for 3 terms Lec.	Lab./Tut.
12.012	Psychology II	3	— 5
12.042	Psychology IIA	3	— 3
26.501	English *or*		
26.571	An Introduction to Modern Drama	1	— ½
and one of—			
10.111	Pure Mathematics II *or*	4	— 1
10.311	Theory of Statistics I *or*	4	— 3
17.601	Physiology and Genetics	2	— 3
		9 min./ 11 max.	9½ min./ 11½ max.

THIRD YEAR
(30 weeks' day course)

		Hours per week for 3 terms Lec.	Lab./Tut.
12.013	Psychology III*	4	— 5
12.044	Psychology IIIA*	3	— 5
	General Studies Elective†	1	— ½
		8	—10½

FOURTH YEAR
(30 weeks' day course)
INDUSTRIAL COURSE ELECTIVE

		Hours per week for 3 terms Lec.	Lab./Tut.
12.045	Psychology IV (Industrial)*	5	—10
	General Studies Elective†	1	— ½
		6	—10½

OR
CLINICAL COURSE ELECTIVE

		Hours per week for 3 terms Lec.	Lab./Tut.
12.055	Psychology IV (Clinical)*	5	—10
	General Studies Elective	1	— ½
		6	—10½

* Students are required to undertake such additional field work and clinical studies, averaging 2 hours per week, as may be prescribed by the Head of the School of Applied Psychology.

†If 53.111 Sociology I has been previously selected as an option, 26.121 Psychology and 26.531 Sociology may not be taken.

APPLIED PSYCHOLOGY—PART-TIME COURSE

Bachelor of Science

First Year (30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
10.011 10.001 10.021	Higher Mathematics I *or* Mathematics I *or* Mathematics IT	4 — 2
53.111	Sociology I *or*	4 — 0
62.111	History and Philosophy of Science I	3 — 1
26.501 26.571	English *or* An Introduction to Modern Drama	1 — ½
		9/8 — 2½/3½

Second Year (30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
12.001	Psychology I	3 — 2
17.001	General and Human Biology	2 — 4
	General Studies Elective‡	1 — ½
		6 — 6½

Third Year (30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
12.012	Psychology II	3 — 5
and one of		
17.601	Physiology and Genetics *or*	2 — 3
10.111	Pure Mathematics II *or*	3 — 2
10.311	Theory of Statistics I	4 — 3
		5 min./ 7 min./ 7 max. 8 max.

Fourth Year* (30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
12.042	Psychology IIA	3 — 3
12.013	Psychology III†	4 — 5
		7 — 8

*Day-time attendance for practical work and clinical tutorials required.

†Students are required to undertake such additional field work and clinical studies, averaging 2 hours per week, as may be prescribed by the Head of the School of Applied Psychology.

‡If 53.111 Sociology I has been previously selected as an option, 26.121 Psychology and 26.531 Sociology may not be taken.

Fifth Year

(30 weeks' part-time course)

		Hours per week for 3 terms Lec.	Lab./Tut.
12.044	Psychology IIIA†	3	5
26.521	Philosophy	1	½
		4	5½

Sixth Year

(30 weeks' part-time course)

INDUSTRIAL ELECTIVE COURSE

		Hours per week for 3 terms Lec.	Lab./Tut.
12.045	Psychology IV (Industrial)†	5	—10

OR

CLINICAL ELECTIVE COURSE

		Hours per week for 3 terms Lec.	Lab./Tut.
12.055	Psychology IV (Clinical)†	5	—10

*Day-time attendance for practical work and clinical tutorials required. In cases where students are unable to satisfy the attendance requirements in the senior years of the degree, the Head of the School may arrange alternative programmes for practical work and clinical tutorials.

†Students are required to undertake such additional field work and clinical studies, averaging 2 hours per week, as may be prescribed by the Head of the School of Applied Psychology.

Prizes in Psychology

The *Australian Psychological Society* Prize in Psychology is awarded annually to a fourth-year student. The Society also awards annually two-years Student Subscriberships to the *Australian Journal of Psychology* to two outstanding students at the end of second year.

The Staff Prize in Psychology is awarded annually to an outstanding second-year student.

PSYCHOLOGY TEXTBOOKS

12.001 Psychology I

Part A: Theory

Whittaker, J. O. *Introduction to Psychology*. Saunders, 1965.
Whittaker, J. O. *Student's Workbook to accompany "Introduction to Psychology"*. Saunders, 1965.

Part B: Practical

Anderson, B. F. *The Psychology Experiment*. Wadsworth, 1966.
Llewellyn, K. *Statistics for Psychology I*. Uni. of N.S.W. Press, 1968.

12.012 Psychology II

Part A: Personality

Sarason, I. G. *Personality: An Objective Approach*. Wiley, 1966, New York.

Part B: Psychological Statistics II

Armore, S. J. *Introduction to Statistical Analysis and Inference*. Wiley, 1966.

Part C: Psychological Testing

Anastasi, A. *Psychological Testing*. Macmillan, 1961.

12.013 Psychology III

Part A: Psychological Statistics III

McNemar, Q. *Psychological Statistics*. Wiley, 1962.

Part B: Electives

Differential Psychology

Tyler, L. E. *The Psychology of Human Differences*. 3rd ed., Appleton-Century, 1965.

Abnormal Psychology

Kisker, G. W. *The Disorganized Personality*. McGraw-Hill, 1964.
Buss, A. H. *Psychopathology*. Wiley, 1966.
Goldstein, M. J. and Palmer, J. O. *The Experience of Anxiety*. 1964.

Child Psychology and Guidance

Mussen, P. H., Conger, J. J. and Kagan, J. *Child Development and Personality*. 2nd ed., Harper and Row, 1963.

Abilities and Cognition

Bruner, G. S., Goodnow, G. G. and Austin, G. A. *A Study of Thinking*. Wiley, 1956 (or paperback ed.: Science Editions, 1965).
Vernon, P. E. *The Structure of Human Abilities*. Methuen, 1961.

Psychometrics

Guilford, J. P. *Psychometric Methods*. McGraw-Hill, 1956.
Miller, George A. *Mathematics and Psychology*. Wiley (paperback).

Social Psychology

Hollander, E. P. *Principles and Methods of Social Psychology*. Oxford U.P., 1967, New York.

*or**

Jones, E. E. and Gerard, H. B. *Foundations of Social Psychology*. Wiley, 1967, New York.

*Selection to be made in consultation with the Head of the School of Applied Psychology.

Learning

Carroll, J. B. *Language and Thought*. Prentice-Hall. Foundations of Modern Psychology Series, 1964.

Keller, F. S. *Learning: Reinforcement Theory*. Random House, N.Y., 1954.

Mednick, S. A. *Learning*. Prentice-Hall. Foundations of Modern Psychology Series, 1964.

Perception

Dember, W. N. *The Psychology of Perception*. Holt & Co., N.Y., 1960.

Motivation

Murray, E. J. *Motivation and Emotion*. Prentice-Hall. Foundations of Modern Psychology Series, 1964.

12.014 Psychology IV

Part A: General Psychology

Postman (ed.). *Psychology in the Making*. Knopf.

Brown, Mandler, Hess and Galanter. *New Directions in Psychology I*. Holt, Rinehart & Winston.

Barron, Olds, Dement and Edwards. *New Directions in Psychology II*. Holt, Rinehart & Winston.

Mandler, Mussen, Kogan and Wallach. *New Directions in Psychology III*. Holt, Rinehart & Winston.

Part B: Special Fields

To be determined in consultation with Head of School.

12.042 Psychology IIA

References will be listed in lectures.

12.044 Psychology IIIA

As for 12.013, Part B, *plus the following:—*

Psychological Guidance

Super, D. E. and Crites, J. O. *Appraising Vocational Fitness*. Harper Intern, Student Reprint, 1962.

Tyler, L. *The Work of the Counsellor*. Appleton-Century.

Counselling Procedures and Practices

Krumboltz, John D. (ed.). *Revolution in Counselling*. Houghton Mifflin, 1966, New York.

Perez, Joseph F. *Counselling Theory and Practice*. Reading, Addison-Wesley, 1965, Massachusetts.

Porter, E. H. *An Introduction to Therapeutic Counselling*. Houghton Mifflin, 1965, Boston.

Rogers, C. R. *On Becoming a Person*. Houghton Mifflin, 1961, Boston.

Sefflre, B. *Theories of Counselling*. McGraw-Hill, Sydney, 1965.

Psychopathology

Cameron, N. *Personality Development and Psychopathology*. Int. Univ. Ed.

Human Factors Engineering

Bass, B. *Organizational Psychology*. Allyn & Bacon Inc., 1966.
Thorndike, E. L. *Personnel Selection*. Wiley, 1947.

12.045 Psychology IV (Industrial)

Part A: Industrial Psychology and Personnel Techniques

Bass, B. *Organizational Psychology*. Allyn & Bacon Inc., 1966.

Part B: Counselling

Arbuckle, D. S. *Counselling: Philosophy, Theory and Practice*. Allyn and Bacon, 1966.
Sefflre, B. *Theories of Counselling*. McGraw-Hill, 1965.
Tallent, N. *Clinical Psychological Consultation*. Prentice-Hall, 1963.

Part C: Social

March, J. G. and Simon, H. A. *Organizations*. Wiley, 1958.
Texts and references for other sections of the course will be detailed during lectures.

12.055 Psychology IV (Clinical)

Arbuckle, D. S. *Counselling: Philosophy, Theory and Practice*. Allyn and Bacon, 1966.
Sefflre, B. *Theories of Counselling*. McGraw-Hill, 1965.
Tallent, N. *Clinical Psychological Consultation*. Prentice-Hall, 1963.

Texts and References for other sections of the course will be detailed in lectures.

12.731 Abnormal and Clinical Psychology

See 12.013 Part B Electives—Abnormal Psychology.

Note: Reference books for all courses will be listed in lectures.

SCHOOL OF BIOLOGICAL SCIENCES

The past few decades have witnessed outstanding developments of those disciplines concerned with living organisms and with the explanation and understanding of the phenomena which they display. Not only are such basic processes as the hereditary mechanisms, the adaption of organisms to the environment, and the interconversions of matter and energy better understood, but considerable progress has been made in the rational exploitation and control of the life phenomena in a wide range of community activity. The availability of employment for the graduate in one or other of the biological sciences has expanded in a spectacular manner in recent years and may well become the most active area of scientific and technological activity in the near future.

As with other groups of related scientific disciplines, the biological sciences increasingly display a convergence and overlap of their boundaries, a situation which has been long realised in this University and assisted by the close administrative ties and the physical proximity of the principal departments concerned with their development. The principal courses offered by the School lie within the framework of the Science course and major sequences to honours level are available in Botany, Zoology. Entomology, Microbiology and Biochemistry. Postgraduate study for the Master of Science degree and for the Doctorate in Philosophy is available in each of the principal areas mentioned above. The regulations of the Science course provide a considerable degree of flexibility in the choice of subjects and the particular vocational interests of students can be met in a large degree. The advice of members of the staff should be sought concerning the best choice of subjects for particular interests.

All the biological major sequences are based on the common triad of Mathematics, Physics and Chemistry, together with General and Human Biology in the first year, and students are advised to bear in mind the increasing dependence of the biological sciences upon the physical sciences. Combinations at advanced levels of Chemistry and Biochemistry with Botany, Zoology, Entomology and Microbiology, enhance the possibilities of subsequent employ-

ment of a stimulating and interesting nature, whether it be in pure or applied research, or in the very wide range of technological fields such as public health, the food industries or agriculture.

BIOLOGICAL SCIENCES TEXTBOOKS

17.001 General and Human Biology

Keeton, W. T. *Biological Science*. Norton, 1967, New York.

17.101 and 17.111 Biochemistry I

Christensen, H. N. and Palmer, G. A. *Enzyme Kinetics: A Learning Programme*, Saunders, 1967.

Conn, E. E. and Stumpf, P. K. *Outline of Biochemistry*. 2nd ed., Wiley, 1966.

Stephenson, W. K. *Concepts of Biochemistry: A Programmed Text*. Wiley, 1967.

West, E. S., Todd., W. R., Mason, H. S. and van Bruggen, J. T. *Textbook of Biochemistry*. 4th ed., Macmillan, 1966.

or

White, A., Handler, R. and Smith, E. L. *Principles of Biochemistry*, 3rd ed., McGraw-Hill, 1964.

Either text gives adequate coverage of the course but there are differences in the treatment of certain sections which are preferred by individual lecturers.

17.102 and 17.112 Biochemistry II

Dixon, M. and Webb, E. C. *Enzymes*, 2nd ed., Longmans, 1964.

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

17.103 Biochemistry

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

17.201 Microbiology I

Stanier, Doudoroff and Adelberg. *The Microbial World* (also published under the title of *General Microbiology*, Macmillan). Prentice-Hall, 2nd ed., 1963.

17.301 Botany I

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

Alexopoulos, C. J. *Introductory Mycology*. Wiley, 1962.

Eames and McDaniels. *Introduction to Plant Anatomy*. McGraw-Hill.

or

Esau, K. *Anatomy of Seed Plants*. Wiley, 1960.

Stafford, G. Q. *Essentials of Plant Physiology*. Heinemann, 1965.

Fogg, G. E. *The Growth of Plants*. Pelican, 1963.

Beadle, Evans and Carolin. *Handbook of the Vascular Plants of the Sydney District and Blue Mountains*. 1962.

17.302 Botany II

Alexopoulos, C. J. *Introductory Mycology*. Wiley, 1962.

Alexopoulos, C. J. and Bold, H. C. *Algae and Fungi*. Macmillan, 1967.

Watson, E. V. *The Structure and Life of Bryophytes*. Hutchinson, 1964.

Sporne, K. R. *The Morphology of Pteridophytes*. Hutchinson, 1966.

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

Carlquist, S. *Comparative Plant Anatomy*. Holt, Rinehart & Winston, 1962.

Hartman, P. E. and Suskind, S. R. *Gene Action*. Prentice-Hall, 1965.

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

Walker. *Plant Pathology*. 2nd ed., McGraw-Hill, 1957.

Beadle, N. C. W., Evans, O. D. and Carolin, R. C. *Handbook of the Vascular Plants of the Sydney District and Blue Mountains*. 1962.

17.401 Zoology I

Barnes, R. D. *Invertebrate Zoology*. Saunders, 1963.

Borradaile, L. A. *The Invertebrata: A Manual for the Use of Students*. 4th ed., rev. by G. A. Kerkut. Cambridge U.P., 1961.

Elton, C. *The Ecology of Mammals*. Methuen.

Jones, A. W. *Introduction to Parasitology*. Addison-Wesley, 1967.

Snedecor, G. W. *Statistical Methods*. Iowa State U.P., 1962.

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

17.402 Zoology II

Florey, E. *General and Comparative Animal Physiology*. Saunders, 1966.

Huettner, A. F. *Fundamental Comparative Embryology of the Vertebrates*. Macmillan.

Klopfer, S. and Hailman, S. P. *An Introduction to Animal Behaviour*. Prentice-Hall, 1967.

Moore, H. B. *Marine Ecology*. Wiley, 1958.

Nalbandov, A. V. *Reproductive Physiology*. Freeman, 1964.

Young, J. Z. *The Life of Vertebrates*. Clarendon Press.

17.501 Entomology I

Gunther, F. A. and Jeppson, L. R. *Modern Insecticides and World Food Production*. Chapman and Hall, 1960.

Patton, R. L. *Introductory Insect Physiology*. Saunders, 1963.

Ross, H. H. *A Textbook of Entomology*. Wiley, 1956, second edition.

17.601 Physiology and Genetics

Klopfer, S. and Hailman, S. P. *An Introduction to Animal Behaviour*. Prentice-Hall, 1967.

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

Snedecor, G. W. *Statistical Methods*. Iowa State U.P., 1962.

SCHOOL OF CHEMISTRY

Chemistry enters into a great many phases of human activity. In primary industry it plays an essential role in the understanding of the chemistry of plants and animals and in the discovery and manufacture of fertilisers, weedicides and insecticides. Its applications in secondary industry are too numerous to classify with any degree of simplicity ranging as they do from the extraction of metals to the manufacture of drugs, dyes, plastics, glass, paints and synthetic fibres. The chemist may be concerned with matters of public health by way of the analysis of foods and drugs, with defence through a study of rocket fuels, explosives and in many other ways; with the law in relation to the patenting of chemical processes. In short, all things material fall within the purview of chemistry. The needs of chemical industry for men competent to devise and develop new processes and to improve existing ones and for men competent to operate these can best be met by different types of training.

Chemistry forms a part of many undergraduate courses offered by this University. On a full-time basis it is studied for only a year in some courses, but in others it is studied for two, three or even four years. (These figures are doubled for part-time courses.) Courses which include a study of chemistry in excess of one year (full-time) or two years (part-time) are arranged in diminishing order of their basic chemistry content, as follows: Applied Chemistry, Science (Chemistry Major), Industrial Chemistry, Polymer Science, Ceramic Engineering, Food Technology and Chemical Engineering. Textile Technology, Fuel Engineering and Metallurgy courses also include chemistry in the first two years, but since the courses are not essentially chemical in nature, they will not be considered further here. A student whose main interest is chemistry is likely to be a little puzzled when first confronted with this array of courses in which chemistry is a major component and may well be uncertain which course he should do.

The School provides two main undergraduate courses whereby a specialised training in Chemistry may be obtained:

1. The Applied Chemistry Course;
2. The Chemistry Major in Science.

Both courses lead to the B.Sc. degree.

In the emphasis it places on Chemistry, the Applied Chemistry course is unique in Australian Universities. The core of the course consists of instruction in the fundamental principles of inorganic, physical, organic and analytical chemistry at a level which satisfies the requirements for professional chemists.

Towards the end of the course students are given an opportunity to develop their particular interests which may be in any one of the six departments. Through its Departments of Analytical Chemistry, of Nuclear and Radiation Chemistry, and of Applied Organic Chemistry, the School provides unusual opportunities for courses of training in these specialised fields.

The Applied Chemistry Course may be taken either full-time (three years for the pass degree, four years for honours) or part-time (six years for the pass degree, eight years for honours). The subject matter of each full-time year is identical with that of the two corresponding part-time years and transfer from full-time to part-time, or vice versa, is possible. No industrial training is required for either the full-time or part-time course, though it is customary for students taking the part-time course to find employment in some branch of chemical industry. **Students who intend to take up chemistry as a career, whether in the academic sphere or in industry, are advised to do the Applied Chemistry course.**

Graduates of the School of Chemistry who have taken the Applied Chemistry Course find employment in all the scientific and technical departments of chemical industry and are particularly well suited to employment in the research, control, development and management sections. They also find employment in universities, the C.S.I.R.O., Australian Atomic Energy Commission, Defence Research, Customs, Public Health and other State and Commonwealth Government organisations.

The School also provides courses in Chemistry which form part of the requirements of the Science Course. By taking a double major in Chemistry in the third year of the Science Course (Chemistry III and Chemistry III Supplementary), it is possible to reach a high degree of specialisation in the subject and at

the same time to obtain a more substantial background of supporting science subjects. Another possibility is to combine Chemistry III with a second third-year science subject such as Mathematics III, Biochemistry II or Geology III. Chemistry III combined with Mathematics III will provide a useful basis for research in X-ray crystallography or theoretical chemistry; combined with Geology III, it will be of assistance to those who later wish to specialise in geochemistry. On a full-time basis, the Science Course, like the Applied Chemistry Course, may be taken in three years (pass) and four years (for honours). On a part-time basis, however, the Science Course may, according to the choice of subjects, require one year longer (seven years) than the Applied Chemistry Course.

The Science Course is more suitable for those planning to become teachers of Chemistry at the high school level. This course is also more suitable for those who wish to acquire advanced knowledge of two fields of study or of borderline subjects.

The highest degree of specialisation in chemistry at the undergraduate level may be gained by taking an Houours course (in either Applied Chemistry or in Science) which is aimed mainly at those whose interest is in pure or applied research and/or teaching. For students in Science, it is desirable but not essential that they should do the double major in Chemistry in order to do Honours in Chemistry. Combinations of Chemistry III and Biochemistry II, Mathematics III or Geology III do, however, form a satisfactory foundation for an honours degree in Chemistry. The Honours course, which is taken preferably in one full-time year, is devoted mainly to research and leads to an Honours B.Sc. degree.

APPLIED CHEMISTRY — FULL-TIME COURSE

Bachelor of Science

This course may be taken at pass or honours standard. The pass course requires full-time attendance at the University for three years. An additional year is required for the honours course.

This course is being revised. The subjects shown in first year are those for the new course, those in later years are for the old course. The new course will take the same number of years but will differ in the relationships of hours of lectures and laboratory work in the different fields of chemistry. The changed programme for these later years will commence with Year II in 1969.

First Year
(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
1.011	Higher Physics I *or*	
1.001	Physics I	3 — 3
2.011	Higher Chemistry I *or*	
2.001	Chemistry I	2 — 4
10.011	Higher Mathematics I *or*	
10.001	Mathematics I	4 — 2
Plus one of—		
5.001	Engineering I	
17.001	General and Human Biology	3 — 3
25.001	Geology I*	
27.031	Geography IS	2 — 4
		12 —12
		or
		11 —13

* Three field excursions, up to five days in all, are an essential part of the course.

Second Year
(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.311	Physical Chemistry	2 — 3
2.341	Chemical Instrumentation*	1 — 2
2.351	Chemical Calculations	1 — 0
2.411	Inorganic Chemistry	1 — 2
2.441	History of Chemistry	1 — 0†
2.511	Analytical Chemistry	2 — 3‡
2.611	Organic Chemistry	2 — 3
10.031	Mathematics	1 — 1
26.501	English *or*	
26.571	An Introduction to Modern Drama	1 — ½
		12 —14½

* Alternative subject 1.212 Physics.
† Term 2 only.
‡ Hours for Term 2: 1 — 3.

Third Year
(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.322	Physical Chemistry	2 — 3
2.361	Applied Chemistry	1 — 0
2.422	Inorganic Chemistry	1 — 2
2.522	Analytical Chemistry	1 — 2
2.622	Organic Chemistry	2 — 5
22.131	Industrial Chemistry	2 — 0
	Two General Studies Electives	2 — 1

Plus one of (see overleaf)

Plus one of—		
2.211	Applied Organic Chemistry	
2.221	Applied Organic Chemistry (Food)	
2.331	Applied Physical Chemistry	1 — 3
2.433	Inorganic Chemistry III	
2.533	Analytical Chemistry III	
2.811	Nuclear and Radiation Chemistry	
		12 —16

FOURTH YEAR — HONOURS COURSE
(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.014	Chemistry IV	3 — 0
2.091	Project	0 —20
	General Studies (Advanced Elective)	2 — 0
		5 —20

Students desiring admission to the Honours course must apply in writing to the Head of the School not later than November 30 of the year in which the third year of the full-time (sixth stage of the part-time) course is completed.

The applicant must pass the final year of the Applied Chemistry Course and have a good academic record before admission will be approved.* The applicant should indicate in which of the following branches of the subject he would prefer to undertake research:

(1) Analytical
(2) Applied Organic
(3) Inorganic
(4) Nuclear and Radiation
(5) Organic
(6) Physical Chemistry

APPLIED CHEMISTRY—PART-TIME COURSE

Bachelor of Science

The part-time course in Applied Chemistry is equivalent to the full-time course and extends over six part-time years, leading to the degree of Bachelor of Science. Honours may be awarded on the completion of an additional year of full-time study or an additional two years of part-time study.

* For admission to the Honours Chemistry Course in Science, the applicant must have passed Chemistry III.

The part-time course has been designed for students employed in the chemical industry but employment in this industry is not obligatory for entrance to the course.

This course is being revised. The subjects shown in Years I and II are those for the new course, those in later years are for the old course. The new course will take the same number of years but will differ in the relationships of hours of lectures and laboratory work in the different fields of chemistry. The changed programme for these later years will commence with Year III in 1969.

First and Second Years
(30 weeks' part-time course)

Two of the following subjects will be taken in the first year and the other two in the second year (as directed).

		Hours per week for 3 terms Lec. Lab./Tut.
1.011	Higher Physics I *or*	
1.001	Physics I	3 — 3
2.011	Higher Chemistry I *or*	
2.001	Chemistry I	2 — 4
10.011	Higher Mathematics I *or*	
10.001	Mathematics I	4 — 2
Plus one of—		
5.001	Engineering I	
17.001	General and Human Biology	3 — 3
25.001	Geology I*	
27.031	Geography IS	2 — 4
		12 —12
		or
		11 —13

* Three field excursions, up to five days in all, are an essential part of the course.

Third Year
(30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.311	Physical Chemistry	2 — 3
2.351	Chemical Calculations	1 — 0
2.441	History of Chemistry	1 — 0*
2.511	Analytical Chemistry	2 — 3†
10.031	Mathematics	1 — 1
		7 — 7

* Term 2 only.
† Hours for Term 2: 1 — 3.

FOURTH YEAR
(30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.341	Chemical Instrumentation*	1 — 2
2.411	Inorganic Chemistry	1 — 2
2.611	Organic Chemistry	2 — 3
26.501	English *or*	1 — ½
26.571	An Introduction to Modern Drama	
		5 — 7½

* Alternative subject—Physics 1.212.

FIFTH YEAR
(30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.322	Physical Chemistry	2 — 3
2.422	Inorganic Chemistry	1 — 2
2.522	Analytical Chemistry	1 — 2
22.131	Industrial Chemistry (Processes)	1½— ½
	General Studies Elective	1 — ½
		6½— 8

SIXTH YEAR
(30 weeks' part-time course)

		Hours per week for 3 terms Lec. Lab./Tut.
2.361	Applied Chemistry	1 — 0
2.622	Organic Chemistry	2 — 5
	General Studies Elective	1 — ½
Plus one of—		
2.211	Applied Organic Chemistry	1 — 3
2.221	Applied Organic Chemistry (Food)	
2.331	Applied Physical Chemistry	
2.433	Inorganic Chemistry III	
2.533	Analytical Chemistry III	
2.811	Nuclear and Radiation Chemistry	
		5 — 8½

Honours in Applied Chemistry

Students desiring to take Honours must apply to the Head of the School not later than November 30 of the year in which the third year of the full-time (sixth stage of the part-time) course is completed.

The requirement for admission to the Honours course is a sufficiently meritorious record in the work of the pass degree.

The major part of the work for Honours will consist of a research project which may be undertaken in any one of the six departments by arrangement with the Head of the School. However, honours will not be awarded in any particular branch of the subject but in the subject as a whole. Attendance will be required at such lectures and seminars as the Head of the School directs.

Applied Chemistry Prizes

In past years it has been the custom of the School of Chemistry to award prizes for various stages and subjects of the Applied Chemistry Course and in other subjects under the control of the School. This practice will be continued this year.

The list of donors, to whom we express our gratitude, includes the following organisations:

The N.S.W. Department of Technical Education.
Australian Glass Manufacturers Co. Pty. Ltd.
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C.S.R. Chemicals Pty. Ltd.
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Tooth and Company Ltd.
Unilever Australia Pty. Ltd.
University of New South Wales Chemical Society.
University of New South Wales Science Association.

CHEMISTRY TEXT AND REFERENCE BOOKS

2.001 Chemistry I

TEXTBOOKS

Ander and Sonnessa. *Principles of Chemistry*. Collier-Macmillan, 1966.
Sanderson. *Principles of Chemistry*. Wiley, 1967.
Hart and Schuetz. *Organic Chemistry*. Houghton Mifflin, 1967.
Aylward and Findlay (eds.). *Chemical Data Book*. 2nd ed., Wiley, 1966.
First Year Chemistry Laboratory Course. Uni. of N.S.W., 1968.

REFERENCE BOOKS

C.H.E.M. Study Project. *Chemistry, an Experimental Science*. Freeman, 1963.
Sanderson. *Chemical Periodicity*. Reinhold, 1961.
Barrow, Kenney, Lassila, Litle and Thompson. *Programmed Supplements for General Chemistry*. Vols. I and II, Benjamin, 1963.
Benfey. *The Names and Structures of Organic Compounds*. Wiley, 1966.
Snyder. *Chemistry, Structure and Reactions*. Holt, Rinehart and Winston, 1966.
Gray and Haight. *Basic Principles of Chemistry*. Benjamin, 1967.

2.001/2 Chemistry I, Part II

TEXTBOOKS

Sienko and Plane. *Chemistry*. McGraw-Hill, 1961.
Glasstone and Lewis. *Elements of Physical Chemistry*. Macmillan, 1962.
English and Cassidy. *Principles of Organic Chemistry*. McGraw-Hill, 1961
Aylward and Findlay (eds.). *Chemical Data Book*. 2nd ed., Wiley, 1966.

REFERENCE BOOKS

C.H.E.M. Study Project. *Chemistry, an Experimental Science*. Freeman, 1963.
Barrow, Kenney, Lassila, Litle and Thompson. *Programmed Supplements for General Chemistry*. Vols. I and II. Benjamin, 1963.
Benfey. *The Names and Structures of Organic Compounds*. Wiley, 1966.
Sanderson. *Chemical Periodicity*. Reinhold, 1961.

2.002 Chemistry II

For Physical Section, see under 2.311.
For Organic Section, see under 2.611.
A. Inorganic Section

TEXTBOOK

Graddon. *An Introduction to Co-ordination Chemistry*.

REFERENCE BOOKS

Bailar. *Chemistry of the Co-ordination Compounds*.
Barnard. *Theoretical Basis of Inorganic Chemistry*.
Pauling. *Nature of the Chemical Bond*.
Emeleus and Anderson. *Modern Aspects of Inorganic Chemistry*.
Sidgwick. *Chemical Elements and their Compounds*, Vols. I and II.
Remy. *Treatise on Inorganic Chemistry*, Vols. I and II.

Cotton and Wilkinson. *Advanced Inorganic Chemistry*. 2nd ed., Wiley, 1966.
Day and Selbin. *Theoretical Inorganic Chemistry*.
Sienko and Plane. *Physical Inorganic Chemistry*.
Basolo and Johnson. *Introduction to Co-ordination Chemistry*.
Lee. *Concise Inorganic Chemistry*.
B. Analytical Section

TEXTBOOK
Day and Underwood. *Quantitative Analysis*. 2nd ed., Prentice-Hall, 1967.

REFERENCE BOOKS
Laitinen. *Chemical Analysis*. New York, McGraw-Hill, 1960.
Willard, Furman and Bricker. *Elements of Quantitative Analysis*. Princeton, N.J., Van Nostrand, 1956.
Blaedel and Meloche. *Elementary Quantitative Analysis*. New York, Harper and Row, 1965. 2nd ed., I.S.R. Reprint.

2.003 Chemistry III

For Physical Section, see under 2.322.
For Organic Section, see under 2.622.
For Analytical Section, see under 2.522.
Inorganic Section

REFERENCE BOOKS
Bailar. *Chemistry of the Co-ordination Compounds*.
Barnard. *Theoretical Basis of Inorganic Chemistry*.
Pauling. *Nature of the Chemical Bond*.
Wells. *Structural Inorganic Chemistry*.
Sidgwick. *Chemical Elements and their Compounds*, Vols. I and II.
Remy. *Treatise on Inorganic Chemistry*, Vols. I and II.
Emeleus and Anderson. *Modern Aspects of Inorganic Chemistry*.
Durrant and Durrant. *Advanced Inorganic Chemistry*. Longmans, 1962.
Cotton and Wilkinson. *Advanced Inorganic Chemistry*. 2nd ed., Wiley, 1966.
Dwyer and Mellor. *Chelating Agents and Metal Chelates*.
Sienko and Plane. *Physical Inorganic Chemistry*.
Lee. *Concise Inorganic Chemistry*.
Lewis and Wilkins. *Modern Co-ordination Chemistry*. Interscience, 1960.
Adams and Raynor. *Advanced Practical Inorganic Chemistry*. Wiley, 1965.

2.022 Chemistry II M

As for 2.002 Chemistry II, omitting Organic Section.

2.042 Chemistry II A

For Physical Section, see under 2.311.
For Organic Section, see under 2.611.

2.053 Chemistry III (Supplementary)

A. *Physical Chemistry Major*—books as for 2.331.
B. *Inorganic Chemistry Major*.

TEXTBOOK
Cotton and Wilkinson. *Advanced Inorganic Chemistry*. 2nd ed., Wiley, 1966.

REFERENCE BOOKS
Pauling. *Nature of the Chemical Bond.*
Emeleus and Anderson. *Modern Aspects of Inorganic Chemistry.*
Basolo and Pearson. *Mechanics of Inorganic Reactions.*
Lewis and Wilkins. *Modern Co-ordination Chemistry.*
Rossotti and Rossotti. *Stability Constants.*
Dwyer and Mellor. *Chelating Agents and Metal Chelates.*
Sienko and Plane. *Physical Inorganic Chemistry.*
Edwards. *Inorganic Reaction Mechanisms.* Benjamin, 1964.
Adams and Raynor. *Advanced Practical Inorganic Chemistry.* Wiley, 1965.
C. Organic Chemistry Major
See Reference Books listed under 2.622.
D. Nuclear and Radiation Chemistry Major—books as for 2.811.

2.053W Chemistry III (Supplementary) (Wollongong)

REFERENCE BOOKS
Hendrickson. *The Molecules of Nature.* Benjamin, 1965.
Klotz. *Chemical Thermodynamics.* Benjamin, 1964.
Moelwyn-Hughes. *Physical Chemistry.*
Kulemans. *Chromatography.*
Lederer, E. and Lederer, M. *Chromatography.*
Knox. *Gas Chromatography.* Methuen, 1962.
Bu'lock, J. D. *The Biosynthesis of Natural Products.* McGraw-Hill, 1965.
Bernfield. *Biogenesis of Natural Compounds.* Pergamon, 1963.
Manske and Holmes. *The Alkaloids.* Academic Press.

2.211 Applied Organic Chemistry

REFERENCE BOOKS
Heftmann. *Chromatography.*
Carney. *Laboratory Fractional Distillation.*
Flory. *Principles of Polymer Chemistry.*
Moore. *Introduction to Polymer Chemistry.*
Rosenberg. *Chemistry and Physiology of the Vitamins.*
Pinder. *Chemistry of the Terpenes.*
Kharasch. *Organic Sulphur Compounds.*
Lundberg. *Autoxidation and Autoxidants,* Vols. I and II.
Pryor. *Mechanisms of Sulphur Reactions.*
Schwarz. *Physical Methods in Organic Chemistry.*
Markley. *The Fatty Acids.* 2nd ed.
Solomon. *Organic Film Formers.* Wiley.

2.221 Applied Organic Chemistry (Food)

REFERENCE BOOKS
Bates and Associates. *Polarimetry, Saccharimetry and the Sugars.*
Neurath. *Proteins.* Vols. I-III, 2nd ed.
Brown and Zerban. *Sugar Analysis.*
Walton. *Principles and Methods of Chemical Analysis.*
Winton and Winton. *Structure and Composition of Foods.*
Joslyn. *Methods in Food Analysis.*
Goodwin. *Comparative Biochemistry of the Carotenoids.*
Mitchell and Smith. *Aquametry—Applications of the Karl Fischer Reagent.*

Heftmann. *Chromatography.*
White et al. *Principles of Biochemistry.*
Markley. *The Fatty Acids.* 2nd ed.

2.311 Physical Chemistry I

TEXTBOOKS

Barrow. *Physical Chemistry.* 2nd ed. McGraw-Hill, 1966.
Daniels et al. *Experimental Physical Chemistry.* 6th ed., McGraw-Hill, 1962.
Pohl. *Quantum Mechanics for Science and Engineering.* Prentice-Hall, 1967.
Shaw. *Introduction to Colloid and Surface Chemistry.* Butterworth, 1966.
Aylward and Findlay (eds.). *Chemical Data Book.* 2nd ed., Wiley, 1966.

REFERENCE BOOKS

Glasstone. *Textbook of Physical Chemistry.* Van Nostrand or Macmillan, 1948.
Jirgensons and Straumanis. *A Short Textbook of Colloid Chemistry.* 2nd ed. Pergamon, 1962.

2.322 Physical Chemistry II

TEXTBOOKS

Barrow. *Physical Chemistry.* 2nd ed., McGraw-Hill, 1966.
Daniels et al. *Experimental Physical Chemistry.* 6th ed., McGraw-Hill, 1962.
Coulson. *Valence.* 2nd ed., Oxford, 1961.
Laidler. *Chemical Kinetics.* 2nd ed., McGraw-Hill, 1965.
Carswell. *Introduction to Nuclear Chemistry.* Elsevier, 1967
or
Friedlander and Kennedy. *Nuclear and Radiochemistry,* 2nd ed., Wiley, 1964.

REFERENCE BOOKS

Kauzman. *Quantum Chemistry.* Academic Press, 1957.
Glasstone, Laidler and Eyring. *Theory of Rate Processes.* McGraw-Hill, 1941.
Bond. *Catalysis by Metals.* Academic Press, 1962.
Dixon. *Spectroscopy and Structure.* Methuen, 1965.
Lewis and Randall. *Thermodynamics.* 2nd ed., rev. by Pitzer and Brewer, McGraw-Hill, 1961.

2.331 Applied Physical Chemistry

TEXTBOOK

Dixon. *Spectroscopy and Structure.* Methuen, 1965.

REFERENCE BOOKS

Benyon. *Mass Spectrometry and its Application to Organic Chemistry.*
Barrow. *Introduction to Molecular Spectroscopy.* McGraw-Hill, 1962.
Bersohn and Baird. *Introduction to Electron Paramagnetic Resonance Spectroscopy.* Benjamin, 1966.
Pople, Schneider and Bernstein. *High Resolution Nuclear Magnetic Resonance.* McGraw-Hill, 1959.

2.341 Chemical Instrumentation

TEXTBOOKS

Daniels et al. *Experimental Physical Chemistry.* 6th ed., McGraw-Hill, 1962.
Martin and Johnson. *Practical Microscopy.* 3rd ed., Blackie, 1958.

REFERENCE BOOKS

Malmstedt, Enke and Toren. *Basic Electronics for Scientists.* Benjamin, 1963.
Chamot and Mason. *Handbook of Chemical Microscopy.* Vol. I, Wiley, 1958.
Strobel. *Chemical Instrumentation.* Addison-Wesley, 1960.
Wood. *Crystals and Light.* Van Nostrand, 1964.

2.351 Chemical Calculations

TEXTBOOKS

Bosworth, Lark and Craven. *The Handling of Chemical Data.* Pergamon, 1967

or

Mandel. *The Statistical Analysis of Experimental Data.* Interscience, 1964.

REFERENCE BOOKS

Bennett and Franklin. *Statistical Analysis in Chemistry and the Chemical Industry.* Wiley, 1954.
Davies. *Statistical Methods in Research and Production.* 3rd ed., Oliver and Boyd, 1957.
Worthing and Geffner. *Treatment of Experimental Data.* Wiley, 1943.

2.361 Applied Chemistry

REFERENCE BOOKS

Corley. *Successful Commercial Chemical Development.* Wiley, 1954.
Landau (ed.). *Chemical Plant.* Reinhold, 1966.
Perry. *Chemical Business Handbook.* 1st ed., McGraw-Hill, 1954.
Johnson. *Analogue Computer Techniques.* McGraw-Hill, 1956.
Shilling. *Process Dynamics and Control.* McGraw-Hill.
Himmelblau. *Basic Principles and Calculations in Chemical Engineering.* 2nd ed., Prentice-Hall, 1967.
Johnstone and Thring. *Pilot Plants, Models and Scale-up Methods in Chemical Engineering.* McGraw-Hill, 1957.
Langhaar. *Dimensional Analysis and the Theory of Models.* Wiley, 1951.

2.411 Inorganic Chemistry I

TEXTBOOKS

Graddon. *An Introduction to Co-ordination Chemistry.*
Vogel. *Textbook of Qualitative Analysis.*

REFERENCE BOOKS

As for 2.002 Inorganic Section, plus
Wells. *Structural Inorganic Chemistry.*
Grinberg (Trans. I. R. Leech). *Introduction to the Chemistry of Complex Compounds.* Pergamon.

2.422 Inorganic Chemistry II

TEXTBOOK

As for 2.053 Inorganic Chemistry Major.

REFERENCE BOOKS

Bailar. *Chemistry of Co-ordination Compounds.*
Wells. *Structural Inorganic Chemistry.*

Sidgwick. *Chemical Elements and their Compounds,* Vols. I and II.
Remy. *Treatise on Inorganic Chemistry,* Vols. I and II.
Dwyer and Mellor. *Chelating Agents and Metal Chelates.*
Sienko and Plane. *Physical Inorganic Chemistry.*
Barnard. *Theoretical Basis of Inorganic Chemistry.*
Lee. *Concise Inorganic Chemistry.*
Lewis and Wilkins. *Modern Co-ordination Chemistry.* Wiley.
Adams and Raynor. *Advanced Practical Inorganic Chemistry.* Wiley, 1965.

2.433 Inorganic Chemistry III

TEXTBOOK
As for 2.053 Inorganic Chemistry Major.

REFERENCE BOOKS
Lewis and Wilkins. *Modern Co-ordination Chemistry.*
Emeleus and Anderson. *Modern Aspects of Inorganic Chemistry.*
Sidgwick. *Chemical Elements and their Compounds,* Vols. I and II.
Remy. *Treatise on Inorganic Chemistry,* Vols. I and II.
Wells. *Structural Inorganic Chemistry.*
Dwyer and Mellor. *Chelating Agents and Metal Chelates.*
Sienko and Plane. *Physical Inorganic Chemistry.*
Edwards. *Inorganic Reaction Mechanisms.* Benjamin.
Adams and Raynor. *Advanced Practical Inorganic Chemistry.* Wiley, 1965.
Hannay. *Solid State Chemistry.* Prentice-Hall, 1967.

2.451 Inorganic/Analytical Chemistry

For Inorganic Section, see 2.411.
Analytical Section

TEXTBOOK
Day and Underwood. *Quantitative Analysis.* 2nd ed., Prentice Hall, 1967.

REFERENCE BOOKS
Laitinen. *Chemical Analysis. New York,* McGraw-Hill, 1960.
Delahay. *Instrumental Analysis.* New York, Macmillan, 1957.

2.511 Analytical Chemistry I

TEXTBOOKS
Blaedel and Meloche. *Elementary Quantitative Analysis.* New York, Harper and Row, 1965. 2nd ed., I.S.R. Reprint.
Brumblay. *Quantitative Analysis.* New York, Barnes and Noble, 1960.

REFERENCE BOOKS
Laitinen. *Chemical Analysis.* New York, McGraw-Hill, 1960.
Delahay. *Instrumental Analysis.* New York, Macmillan, 1957.

2.522 Analytical Chemistry II

TEXTBOOKS
Blaedel and Meloche. *Elementary Quantitative Analysis.* New York, Harper and Row, 1965. 2nd ed., I.S.R. Reprint.
Delahay. *Instrumental Analysis.* New York, Macmillan, 1957.

REFERENCE BOOKS
Laitinen. *Chemical Analysis.* New York, McGraw-Hill, 1960.

Schwarzenbach. *Complexometric Titrations.* London, Methuen, 1957.
Lingane. *Electroanalytical Chemistry.* Interscience, 1958.
Hildebrand, Lundell, Hofmann and Bright. *Applied Inorganic Analysis.* Wiley, 1953.
Strouts, Gilfillan and Wilson (Eds.). *Analytical Chemistry,* 3 vols., Oxford University Press, 2nd ed.

2.533 Analytical Chemistry III

REFERENCE BOOKS

Laitinen. *Chemical Analysis.* New York, McGraw-Hill, 1960.
Heftmann. *Chromatography.* Reinhold, 1961.
Purnell. *Gas Chromatography.* Wiley, 1962.
Schwarzenbach. *Complexometric Titrations.* London, Methuen, 1957.
Flaschka. *E.D.T.A. Titrations.* Pergamon, 1959.
Kolthoff and Lingane. *Polarography,* Vols. I and II. Interscience, 2nd ed., 1952.
Milner. *The Principles of Application of Polarography and other Electroanalytical Processes.* Longmans, 1951.
Meites. *Polarographic Techniques.* Interscience, 1955.

2.611 Organic Chemistry I

TEXTBOOKS

1. Roberts and Caserio. *Basic Principles of Organic Chemistry*
   or
   Roberts and Caserio. *Modern Organic Chemistry.* Benjamin, 1967
   or
   Morrison and Boyd. *Organic Chemistry.* 2nd ed., Allyn & Bacon, 1966.
2. Vogel. *Elementary Practical Organic Chemistry.* Pt. II "Qualitative Organic Analysis", Longmans, 1957
   or
   Wild. *Characterisation of Organic Compounds.* Cambridge, 1958
   or
   Shriner, Fuson and Curtin. *Systematic Identification of Organic Compounds.* 5th ed., Wiley, 1964.

2.622 Organic Chemistry II

TEXTBOOKS

1. Roberts and Caserio. *Basic Principles of Organic Chemistry.* Benjamin, 1964.
2. Sykes. *A Guidebook to Mechanism in Organic Chemistry.* Wiley, 1965.
3. *and one of the following*
   Vogel. *Elementary Practical Organic Chemistry,* Pt. II, "Qualitative Organic Analysis". Longmans, 1957.
   Wild. *Characterisation of Organic Compounds.* Cambridge, 1958.
   Shriner, Fuson and Curtin. *Systematic Identification of Organic Compounds.* Wiley, 5th ed., 1964.

REFERENCE BOOKS

Eliel. *Stereochemistry of Carbon Compounds.* McGraw-Hill, 1962.
Hine. *Physical Organic Chemistry.* McGraw-Hill, 1964.
Gould. *Mechanism and Structure in Organic Chemistry.* Holt, Rinehart and Winston, 1959.

Albert. *Heterocyclic Chemistry*. Athlone Press, 1959.
Acheson. *An Introduction to the Chemistry of Heterocyclic Compounds*. Interscience, 1960.
De Mayo. *Chemistry of Natural Products*. Vol. II, "Mono and Sesquiterpenoids". Interscience, 1959.
Hallas. *Organic Stereochemistry*. McGraw-Hill, 1965.

2.811 Nuclear and Radiation Chemistry

TEXTBOOKS

Carswell. *Introduction to Nuclear Chemistry*. Elsevier.
OR
Friedlander and Kennedy. *Nuclear and Radiochemistry*, 2nd ed., Wiley, 1964.
OR
Harvey. *Introduction to Nuclear Physics and Chemistry*. Prentice Hall, 1962.

REFERENCE BOOKS

Haissinsky (Trans. D. G. Tuck). *Nuclear Chemistry and its Applications*. Addison-Wesley, 1964.
Glasstone. *Source Book on Atomic Energy*.
Farley. *Elements of Pulse Circuits*. Methuen, 1955.
Sharpe. *Nuclear Radiation Detectors*. Methuen, 1964.
Taylor. *The Measurement of Radioisotopes*. Methuen, 1959.
Spinks and Woods. *An Introduction to Radiation Chemistry*. Wiley, 1964.

PHYSIOLOGY

FOR STUDENTS IN THE SCIENCE COURSE

Courses in Physiology for students in the Faculty of Science were commenced in 1963. During the second and third years of their B.Sc. course, students may take Physiology I and Physiology II. Students reaching an adequate standard in these subjects may proceed to a B.Sc. degree with Honours by taking Physiology III during the fourth year of the course. For the present, Physiology will only be available as a day course.

Physiology I is designed as a course in General Physiology, and uses as its main source of illustration examples from the field of mammalian physiology. This course is self-contained and apart from serving as an introductory course to Physiology II, should be useful for students in other biological fields. Students wishing to enrol in Physiology I must have completed Chemistry I, Physics I and General and Human Biology.

Physiology II is a more advanced course in physiology, and is orientated towards the more biophysical aspects of physiology. Students taking Physiology II should have passed in the subject Biochemistry I. Any student who wishes to proceed to Physiology II and has not done Biochemistry I can proceed by arrangement with the Head of the School, provided he has passed in either Physics II or Chemistry II.

Lecture, laboratory and tutorial arrangements for Physiology subjects are as follows:—

73.011 Physiology I

	Hours per week for 3 terms
Lectures	3
Laboratory	5
Tutorials	1
	9

73.012 Physiology II

	Hours per week for 11 weeks (Term 1)	Hours per week for 19 weeks (Terms 2 and 3)
Lectures	3	4
Laboratory	8	8
Tutorials	1	2
	12	14

PHYSIOLOGY TEXT BOOKS

73.011 Physiology I

Ganong. *Review of Medical Physiology*. Lange, 2nd ed.

73.012 Physiology II

Selkurt, E. E. (ed.). *Physiology*. 2nd ed., Little, Brown & Co., 1966, Boston.

AND EITHER

Mountcastle, V. B. *Medical Physiology*. 12th ed., Mosby, 1967.

OR

Ruch, T. C. and Patton, H. *Physiology and Biophysics*. Saunders, 19th ed., 1965.

GEOLOGY

FOR STUDENTS IN THE SCIENCE COURSE

Students may major in Geology in the Science course (see the regulations governing this course). This course is available on both a full-time and a part-time basis and leads to the degree of Bachelor of Science, Pass or Honours. Students majoring in Geology will complete the following subjects:—

First year—25.001 Geology I (as for the Applied Geology degree course).

Second year—25.002 Geology II (as for the Applied Geology degree course).

Third year—25.003 Geology III (as for the Applied Geology degree course).

In addition, students in this course may take a second Geology subject in their third year, 25.013 Geology III (Supplementary). This course covers fields not dealt with in other Geology courses and advanced or specialized treatment of topics studied earlier. Section (a) of the course is compulsory and contains Geology of Fuels, Geomorphology and Photogeology, Structural Geology, Oceanography, Geochemistry and Geophysics. Candidates may select *either* Section (b) consisting of Clay Mineralogy and Mineragraphy, *or* Section (c) consisting of Stratigraphy and Palaeontology, to complete the course.

Honours in Geology

Full-time students in the Faculty of Science who have completed the two third year Geology subjects and part-time students who have completed course requirements up to the end of the sixth year and whose programme includes the two third year Geology subjects may apply to the Head of the School of Applied Geology to read for an Honours degree in Geology. Students who have majored in either Physics and Geology *or* Chemistry and Geology, may also be admitted with a view to studies in geophysics or geochemistry respectively.

The Honours course will consist of:—

A short field assignment with appropriate work in the laboratory on material collected, the results of both the field and laboratory investigations to be presented in a graduation thesis. Advanced lectures, practical work and seminars. Short laboratory assignments on specific problems may be given.

Further details of the Honours course may be had from the Head of School.

Full-time students will cover the Honours work in the fourth year of the course. Part-time students will be required to commence their field thesis work at the end of the sixth year of their course and advanced laboratory assignments will be done in the eighth year along with the further work necessary to complete the field thesis work.

Students seeking to do Honours in Geology will have to satisfy the Head of the School that they have attained a sufficient standard in their pass course work to indicate their ability to undertake geological studies at a more advanced level.

GEOLOGY TEXT AND REFERENCE BOOKS

25.001 Geology I

TEXTBOOKS

Longwell and Flint. *Introduction to Physical Geology*. Wiley.

Read. *Rutley's Elements of Mineralogy*. Murby, London.

Dana's Minerals and How to Study Them. 1963, 3rd Science edition. Revised by C. S. Hurlbut, Jnr.

McElroy. *Explanatory Notes to accompany the Sydney 4-mile Geological Map (with map)*. Bureau of Mineral Resources, Canberra.

REFERENCE BOOKS

Holmes. *Principles of Physical Geology*. Revised ed. Nelson & Sons, London, 1965.

Ford. *Dana's Textbook of Mineralogy*. Wiley.

Dunbar. *Historical Geology*. Wiley.

Morley Davies. *An Introduction to Palaeontology*.

25.002 Geology II

(a) Petrology I

TEXTBOOKS

Kerr. *Optical Mineralogy*. McGraw-Hill, 1959.

Williams, Turner and Gilbert. *Petrography*. Freeman, 1954.

REFERENCE BOOKS

Harker. *Petrology for Students*.

Hatch, Wells and Wells. *The Petrology of the Igneous Rocks*.

Tyrrell. *The Principles of Petrology.*
Turner and Verhoogen. *Igneous and Metamorphic Petrology.*
Harker. *Metamorphism.*
Wahlstrom. *Theoretical Igneous Petrology.* Wiley.

(b) Palaeontology I

TEXTBOOK
Moore, Lalicker and Fischer. *Invertebrate Fossils.* McGraw-Hill, 1952.
OR
Beerbower. *Search for the Past.* Prentice-Hall, 1960.

REFERENCE BOOKS
Woods. *Palaeontology Invertebrate.* Cambridge.
Shrock and Twenhofel. *Principles of Invertebrate Palaeontology.* McGraw-Hill.
Arnold. *An Introduction to Palaeobotany.* McGraw-Hill, 1947.

(c) Stratigraphy I

TEXTBOOK
Krumbein and Sloss. *Stratigraphy and Sedimentation.* 2nd ed.

REFERENCE BOOKS
Woodford. *Historical Geology.* Freeman, 1965.
David (ed. Browne). *Geology of the Commonwealth of Australia.* 3 vols. Arnold, 1950.
Shrock. *Sequence in Layered Rocks.*

(d) Mineralogy II

TEXTBOOKS
Phillips. *An Introduction to Crystallography.*
Hurlbut (ed.). *Dana's Manual of Mineralogy.*

REFERENCE BOOK
Wahlstrom. *Optical Crystallography.* 3rd ed.

25.003 Geology III

Petrology II

TEXTBOOK
Kerr. *Optical Mineralogy.* McGraw-Hill, 1959.

REFERENCE BOOKS
Turner and Verhoogen. *Igneous and Metamorphic Petrology.*
Harker. *Metamorphism.*

Stratigraphy II

REFERENCE BOOKS
Kuenen. *Marine Geology.*
Gignoux. *Stratigraphic Geology* (English translation).
David (ed. Browne). *Geology of the Commonwealth of Australia.* 3 vols, 1950.
Dunbar and Rodgers. *Principles of Stratigraphy.* Wiley, 1957.

Stratigraphical Palaeontology

TEXT BOOKS

Colbert. *Evolution of the Vertebrates.*
Von Koenigswald. *The Evolution of Man.*

Mineralogy III

REFERENCE BOOKS

Azaroff and Buerger. *The Powder Method.* McGraw-Hill.
Buerger. *X-ray Crystallography.* Wiley.
Henry, Lipson and Wooster. *The Interpretation of X-ray Diffraction Photographs.* Macmillan.
Bunn. *Chemical Crystallography.* Oxford.
Wahlstrom. *Optical Crystallography.* 3rd ed. Wiley.
Evans. *Crystal Chemistry.* Cambridge.

Geophysics I

TEXT BOOK

Howell. *Introduction to Geophysics.* McGraw-Hill, 1959.

REFERENCE BOOKS

Bullen. *Introduction to Theory of Seismology.* Cambridge, 1963.
Garland. *The Earth's Shape and Gravity.* Pergamon, 1964.
Gutenberg. *Physics of the Earth's Interior.* Academic, 1959.
Heiskanen and Vening Meinesz. *The Earth and its Gravity Field.*
Jacobs. *The Earth's Core and Geomagnetism.* Pergamon, 1963.
Irving. *Paleomagnetism.* Wiley, 1964.
Chapman. *The Earth's Magnetism.* Methuen, 1951.
Hill. *The Sea.* Vol. 3. Wiley, 1963.

Structural Geology I

TEXTBOOKS

Hills. *Outlines of Structural Geology.* 3rd ed., 1953.
Phillips. *Use of Stereographic Projection in Structural Geology.* 1954.

REFERENCE BOOKS

De Sitter. *Structural Geology.* 1956.
Billings. *Structural Geology.* 1954.
Turner. *Mineralogical and Structural Evolution of the Metamorphic Rocks.* Geol. Soc., America, 1948.
Turner and Weiss. *Structural Analysis of Metamorphic Tectonics.* McGraw-Hill, 1963.
Hills. *Elements of Structural Geology,* 1963.

Economic Geology

(i) Coal

TEXTBOOK

Raistrick and Marshall. *The Nature and Origin of Coal and Coal Seams.* 1952.

REFERENCE BOOK

Francis. *Coal, Its Formation and Composition.*

(ii) Oil

TEXTBOOK

Levorsen. *Petroleum Geology*. 1954.

REFERENCE BOOK

LeRoy. *Subsurface Geologic Methods*.

(iii) Ore Deposits

REFERENCE BOOKS

Edwards. *Textures of the Ore Minerals*. 2nd ed., 1954.
Lindgren. *Mineral Deposits*. 4th ed., 1933.
Fiftieth Anniversary Volume of Economic Geology, Vol. I. Society of Economic Geologists, Urbana, Illinois.
Geology of Australian Ore Deposits. 2nd ed., Melbourne, 1965. Aust. Inst. Min. and Met.

25.004 Geology IV

Mining Geology

TEXT BOOK

Lawrence (ed.). *Exploration and Mining Geology*. Melbourne, 1965. Aust. Inst. Min. Met.

REFERENCE BOOK

McKinstry. *Mining Geology*. Prentice-Hall.

Photogeology

REFERENCE BOOKS

Krynine and Judd. *Principles of Engineering Geology and Geotechnics*. McGraw-Hill, 1957.
Leuder. *Aerial Photo Interpretation*. McGraw-Hill, 1959.
Manual on Photographic Interpretation. Am. Soc. of Photogrammetry, Washington, 1960.

Geophysics II

TEXT BOOKS

Dobrin. *Introduction to Geophysical Prospecting*. McGraw-Hill, 1960.
Parasnis. *Principles of Applied Geophysics*. Methuen, 1962.

REFERENCE BOOKS

Pirson. *Handbook of Well Log Analysis*. Prentice-Hall, 1963.
Dix. *Seismic Prospecting for Oil*. Harper, 1952.
Edge and Laby. *The Principles and Practice of Geophysical Prospecting*. Cambridge, 1931.
Grant and West. *Interpretation Theory in Applied Geophysics*. McGraw-Hill, 1964.
Heiland. *Geophysical Exploration*. Prentice-Hall, 1940.
Jakosky. *Exploration Geophysics*. Trija, 1950.

Petroleum Engineering

REFERENCE BOOK

Uren. *Petroleum Production Engineering Development*.

25.013 Geology III (Supplementary)

Oceanography

TEXT BOOK

Pickard. *Descriptive Physical Oceanography*. Pergamon, 1964.

REFERENCE BOOKS

King. *Introduction to Oceanography*. McGraw-Hill.

Kuenen. *Marine Geology*. Wiley.

Palaeontology II

TEXTBOOK

Glaessner. *Principles of Micro-palaeontology*. Melbourne University Press, 1945. Hafner reprinted ed., 1963.

REFERENCE BOOKS

Cushman. *Foraminifera*. Harvard University Press, 1950.

Beerbower. *Search for the Past*. Prentice-Hall, 1960.

Mayr, Linsley and Usinger. *Methods and Principles of Systematic Zoology*. McGraw-Hill.

Simpson. *Principles of Animal Taxonomy*. Columbia University Press, 1961.

Stratigraphy III

See list for Stratigraphy II (25.003).

Structural Geology II

TEXT BOOK

De Sitter. *Structural Geology*. 1956.

REFERENCE BOOK

As for Structural Geology I (25.003).

Geophysics II

As for Geophysics II (25.004).

Geochemistry

TEXT BOOK

Mason. *Principles of Geochemistry*. 2nd ed.

REFERENCE BOOKS

Abelson. *Researches in Geochemistry*.

Rankama and Sahama. *Geochemistry*. 1950.

Goldschmidt. *Geochemistry*.

Smales and Wager. *Methods in Geochemistry*.

Mineragraphy

TEXT BOOKS

Edwards. *Textures of the Ore Minerals*. 2nd ed., 1954.

Hallimond. *1953 Manual of the Polarizing Miscroscope*.

REFERENCE BOOKS

Cameron. *Ore Microscopy*. 1961.

Ramdohr. *Die Erzmineralien und ihre Verwachsungen*. 3rd ed., 1960.

Clay Mineralogy

REFERENCE BOOKS

Grim. *Clay Mineralogy*. 1953.

Grim. *Applied Clay Mineralogy*. 1962.

SCHOOL OF MATHEMATICS

Throughout Australia and, in fact, throughout the world, there is an extreme shortage of mathematicians in universities, in industry, in research establishments and in schools. Employment can be found for mathematicians with almost every type of qualification.

Traditionally, mathematics is classified into Pure Mathematics, Applied Mathematics and Statistics. The classification is not a very sharp one and there is considerable overlap and interaction between the three branches.

The Pure Mathematician is concerned with the study of mathematics for its own sake, irrespective of (though often with an eye on) possible applications in the natural, social or technical sciences and in industry. The main avenues of employment for a Pure Mathematician are the Universities, the teaching services, and some research establishments such as the C.S.I.R.O. The growth of population in Australia has resulted in a large increase in the enrolments of Australian Universities and the shortage of mathematicians at the Universities is desperate. A student who graduates with a good honours degree should find little difficulty in becoming a university lecturer after three years as a teaching fellow or postgraduate student while working for a Ph.D.

In the past the employment of mathematicians in Australian industry and commerce was rather uncommon; however, over the last few years there has been a remarkable change, corresponding to the general recognition of the desirability of making quantitative what was previously mere qualitative. Amongst many reasons responsible for the change in the employment picture, one of the most important is the advent of high speed computers, which have made possible the detailed mathematical analysis of complex practical situations which could not have been carried out without them.

For example, it is now generally recognised that every reasonably large establishment should employ a statistician or team of

statisticians. There must be efficient and well designed supervision of the quality and testing of products. The analysis of sales and business methods must be in the hands of experts. Statisticians are also found in many research establishments, in government departments, in industry, in the C.S.I.R.O., and in the Universities, where they are concerned with the design of experiments and analyses of the results obtained. Further, mathematically oriented statisticians may spend their time on the invention of important mathematical descriptions of physical and social phenomena. Mathematical relations governing the behaviour of electricity, energy and satellites, for example, are well known; it is not so well known, however, that other mathematical theories are being developed in nearly every field of endeavour by persons trained in statistical theory and probability: for example, in public works for statistical models to assisting the design of dams; in sociology for theories explaining migration; and in biology for theories of inheritance. Students interested in working in these fields should study the courses in Theory of Statistics.

Applied Mathematics consists of the application of mathematical methods to the study of nature. In different Australian universities, different fields of study are emphasised, but in each case the study of nature and her laws is the main purpose, the mathematical technique being the means to this end. In this Department the main field of study is modern theoretical physics, with an emphasis on quantum mechanics, nuclear theory, and statistical mechanics. However, other branches of Applied Mathematics are included in the course, such as electro-magnetic theory, classical dynamics, mathematical hydrodynamics and aerodynamics, theory of elasticity and solid state theory. In this general field, the normal qualification for independent research and for university employment, is a Ph.D. degree, following upon an Honours B.Sc. degree. The Department of Applied Mathematics includes provision for this full course. Furthermore, it is highly desirable for young graduates in this field who have recently qualified for a Ph.D. degree to go overseas for some time in order to widen their experience. Overseas contacts exist, and every effort is made to place graduates suitably.

One of the spectacular aids to industry and research is the high-speed computer. It requires skilled training to maintain and programme for a high-speed machine costing many hundreds of thousands of pounds. The number of persons in Australia qualified to take charge of a large machine is quite small. A graduate with

satisfactory attainments in this field is assured of a well-paid and interesting position. The courses in Applied Mathematics and Statistics include training in programming for the digital computers and in numerical analysis. Students will have considerable practice on the university's computers.

It must not be thought that an honours degree is necessary for success in all these fields. Pass degrees are satisfactory for a variety of positions in government departments, commercial or industrial organizations and experimental laboratories, but, of course, an honours degree would in almost all cases give priority.

The student will notice from the comments following this preamble that the courses in Theory of Statistics and Applied Mathematics may be so linked with the Pure Mathematics course that a change from one of these to Pure Mathematics is possible at any stage.

THE COURSES AND SUBJECTS PROVIDED BY THE SCHOOL

The School of Mathematics provides courses at the Pass and Honours levels in Pure Mathematics, Applied Mathematics and Theory of Statistics. Full details of the subjects and their relations with other subjects in the Science Course appear in the University Calendar. Any student who feels that he does not understand the situation should consult one of the enrolment officers of the school.

HONOURS COURSES IN MATHEMATICS

The Honours courses require four years of study. In the fourth year the student must devote his full time to his chosen subject and to a course in Humanities.

There are three different fourth year Honours courses in the School of Mathematics, namely: Pure Mathematics, Applied Mathematics and the Theory of Statistics. The requirements for entry to fourth year mathematics courses are indicated below.

(a) Pure Mathematics

Permission must be obtained to enter the fourth year course in Pure Mathematics. Such permission is not likely to be granted unless the applicant has passed in Pure Mathematics III (Higher).

(b) Applied Mathematics

Permission must be obtained to enter the fourth year course in Applied Mathematics. Such permission is not likely to be granted

unless the applicant has passed in Applied Mathematics III (Higher).

(c) Theory of Statistics

Permission must be obtained to enter the fourth year course in the Theory of Statistics. Such permission is not likely to be granted unless the applicant has passed in Theory of Statistics II (Higher) and Pure Mathematics III.

If a student is studying for an Honours degree in either Theory of Statistics or Applied Mathematics and for some reason finds this is unsuitable, he may turn his interest to Pure Mathematics.

Any student interested in gaining an Honours degree should consult one of the professors in the School of Mathematics prior to enrolling for first year.

It should be noted that transfer from the Higher level to the ordinary level of the various mathematical subjects can be made at any time if the student feels that he has made a mischoice. Transfer from ordinary courses to Higher courses will leave the student with an almost impossible task and could only be made in exceptional circumstances.

PASS COURSES

Except for students who wish to take Theory of Statistics II, there are few restrictions on the choice of subjects. Naturally, there is the general rule that the first stage of a sequence of subjects must precede later stages.

The course of study for a student wishing to graduate at the Pass level in Theory of Statistics must include Mathematics I, Pure Mathematics II, Pure Mathematics III, Theory of Statistics I and Theory of Statistics II.

Though there is no regulation to demand it, students who wish to specialise in Applied Mathematics are advised to take Pure Mathematics III if they wish to attempt Applied Mathematics III in the third year. This would mean, of necessity, the inclusion of five mathematical subjects for the degree.

MATHEMATICS AS A SUBSIDIARY SUBJECT

In order to gain a "major" in Mathematics, a student should include in his course at least five subjects offered by the School of Mathematics. Students whose main interests lie in other fields will not desire to include so much Mathematics.

If it is intended that only three mathematical subjects are to be taken, then Mathematics I, Pure Mathematics II and Pure Mathematics III would be a sequence providing some depth. However, consideration should be given to the inclusion of Theory of Statistics I or Applied Mathematics II. These are second year (Group II) subjects. The combination of at least one of these with Pure Mathematics II gives a broader coverage at somewhat less depth than Pure Mathematics III.

SCHOOL TEACHERS

There is no doubt that in order to be well qualified as a high school teacher of mathematics it is desirable that Mathematics I, Pure Mathematics II and Pure Mathematics III should be passed, and that two other subjects should be selected from the Theory of Statistics or Applied Mathematics sequences. This extra work will broaden the prospective teacher's outlook and will certainly improve his teaching work.

Those who feel that they may be interested in proceeding to a higher degree after graduation are advised to attempt some of the courses at the higher level.

STUDENTS WITH LOW MATHEMATICAL QUALIFICATIONS

Students who have only a pass in Mathematics Level II (Short) at the Higher School Certificate or who have been inadequately prepared even though they have passed Mathematics Level II (Full), should see that they do not fall behind the class. Attention is directed to the Bridging Courses in Mathematics given over the University of N.S.W. Radio Station VL2UV. Tutorial time is provided by the School in Mathematics I. Students should use these tutorial periods to obtain advice on supplementary reading to make up any deficiencies in their pre-university training. If, after receiving this advice, the student cannot keep up with the class, he should consult a senior member of the staff of the School of Mathematics.

STUDENTS TRANSFERRING FROM OTHER COURSES

In some cases the mathematical subjects of the Science Course differ quite considerably from the mathematics taught to students following other courses (e.g., Engineering). Students transferring to the Science Course and wishing to obtain credit for work done in previous courses should make application through the Admis-

sions Office as early as possible. The staff of the School will advise students in such cases but this does not relieve the student of the reponsibility of making an early application through the correct channels.

SUBJECTS SUBSIDIARY TO MATHEMATICS

As mentioned above, a student wishing to major in Mathematics must pass other Science subjects in accordance with Science Course regulations. In this connection it is worth noting that the Applied Mathematics Course has a considerable content of mathematical physics and there is no doubt that Physics I and/or Physics II would assist the student.

Mathematics Prizes

There are at present available prizes of $20 each in the subjects Theory of Statistics I, Theory of Statistics II and Theory of Statistics III, from funds obtained through the Department of Statistics; also a prize of $20 and a year's subscription to the Statistical Society of Australia, New South Wales Branch, from that Society in the subject Theory of Statistics III.

MATHEMATICS TEXT AND REFERENCE BOOKS

10.001 Mathematics I

TEXTBOOKS

Beaumont, R. A. and Pierce, R. S. *The Algebraic Foundations of Mathematics.* Addison-Wesley.
Purcell, E. J. *Calculus with Analytic Geometry.* Appleton-Century-Crofts.

REFERENCE BOOKS

Ball, R. W. *Principles of Abstract Algebra.* Holt, Rinehart and Winston.
Coulson, A. E. *An Introduction to Matrices.* Longmans.
Keane, A. and Senior, S. A. *Complementary Mathematics.* Science Press.
McCoy, N. H. *Introduction to Modern Algebra.* Allyn and Bacon.
Rose, I. H. *Algebra: An Introduction to Finite Mathematics.* Wiley.
Shanahan, P. *Introductory College Mathematics.* Prentice-Hall.
Smith, W. K. *Limits and Continuity.* (Collier-Macmillan) (Paperback).
Taylor, H. E. and Wade, T. L. *University Freshman Mathematics.* Wiley.
Whitesitt, J. E. *Principles of Modern Algebra.* Addison-Wesley.

SUPPLEMENTARY READING LIST

Adler, I. *The New Mathematics.* Mentor Press.
Allendoerfer and Oakley. *Principles of Mathematics.* McGraw-Hill.
Courant and Robbins. *What is Mathematics?* Oxford University Press.
Sawyer, W. W. *A Concrete Approach to Abstract Algebra.* Freeman.
Sawyer, W. W. *Prelude to Mathematics.* Pelican.

10.011 Higher Mathematics I

TEXTBOOKS

Beaumont, R. A. and Pierce, R. S. *The Algebraic Foundations of Mathematics.* Addison-Wesley.
Blank, A. A. *Problems in Calculus and Analysis.* Wiley.
Courant, R. and John, F. *Introduction to Calculus and Analysis.* Wiley.

REFERENCE BOOKS

As for 10.001 Mathematics I.

SUPPLEMENTARY READING LIST

As for 10.001 Mathematics I.

10.021 Mathematics IT

TEXTBOOK

Purcell, E. J. *Calculus with Analytic Geometry.* Appleton-Century-Crofts.

REFERENCE BOOKS

Allendoerfer, C. B. and Oakley, C. O. *Fundamentals of College Algebra.* McGraw-Hill.
Fine, N. J. *Introduction to Modern Mathematics.* Rand McNally & Co.
Johnson, W. G. and Zaccaro, L. N. *Modern Introductory Mathematics.* McGraw-Hill.
Nahikian, H. M. *Topics in Modern Mathematics.* Macmillan.

10.031 Mathematics

TEXTBOOKS

Keane, A. and Senior, S. A. *Mathematical Methods.* Science Press.

REFERENCE BOOKS

Aitken, A. C. *Determinants and Matrices.* Oliver and Boyd.
Carslaw, H. S. and Jaeger, J. C. *Operational Methods in Applied Mathematics.* Oxford University Press.
Churchill, R. V. *Modern Operational Mathematics in Engineering.* McGraw-Hill.
Ferrar, W. *Algebra.* Clarendon.

10.111 Pure Mathematics II

TEXTBOOKS

Churchill, R. V. *Introduction to Complex Variables and Applications.* McGraw-Hill International Students Edition.
Protter, M. H. and Morrey, C. B. *Modern Mathematical Analysis.* Addison-Wesley.

REFERENCE BOOKS

Burkill, J. C. *Theory of Ordinary Differential Equations.* Oliver and Boyd.
Churchill, R. V. *Modern Operational Methods in Engineering.* McGraw-Hill.
Keane, A. *Integral Transforms.* Science.
Paige, L. J. and Swift, J. D. *Elements of Linear Algebra.* Ginn.
Pierce, B. O. *A Short Table of Integrals.* Ginn.
Silverman, R. A. *Introductory Complex Analysis.* Prentice-Hall.

10.112 Pure Mathematics III

TEXTBOOKS

Griffin, H. *Elementary Theory of Numbers.* International Students ed., McGraw-Hill.

Miller, K. S. *Elements of Modern Abstract Algebra.* International Students reprint, Harper.

Ryser, H. *Combinatorial Analysis.* Carus Monograph Series, Wiley.

Simmons, G. F. *Introduction to Topology and Modern Analysis.* International Students ed., McGraw-Hill.

Willmore, J. J. *An Introduction to Differential Geometry.* Oxford University Press.

REFERENCE BOOKS

Birkhoff, G. S. and Rota, G. C. *Ordinary Differential Equations.* Ginn.

Carslaw, H. S. and Jaeger, J. *Operational Methods in Applied Mathematics.* Dover.

Churchill, R. V. *Modern Operational Mathematics in Engineering.* McGraw-Hill.

Hall, M. *Combinatorial Analysis.* Blaisdell.

Hurewicz, W. *Lectures on Ordinary Differential Equations.* Wiley.

Jacobson, W. *Lectures in Abstract Algebra,* Vols. I and II. Van Nostrand.

Sneddon, I. N. *Elements of Partial Differential Equations.* McGraw-Hill.

Van der Waerden, B. L. *Modern Algebra.* Ungar.

10.121 Pure Mathematics II (Higher)

This course is unlikely to be given in 1968.

10.122 Pure Mathematics III (Higher)

TEXTBOOKS

Cartan, H. *Elementary Theory of Analytic Functions of One or Several Complex Variables.* Addison-Wesley.

Herstein, I. N. *Topics in Algebra.* Blaisdell.

Rudin, W. *Real and Complex Analysis.* McGraw-Hill, 1966.

Sneddon, I. N. *Elements of Partial Differential Equations.* McGraw-Hill.

Willmore, J. J. *An Introduction to Differential Geometry.* Oxford.

REFERENCE BOOKS

Ahlfors, L. V. *Complex Analysis.* McGraw-Hill.

Bateman, H. *Partial Differential Equations.* Cambridge University Press.

Birkhoff, G. S. and Rota, G. C. *Ordinary Differential Equations.* Ginn.

Coppel, W. A. *Stability and Asymptotic Behaviour of Differential Equations.* Heath.

Dugundji, J. *Topology.* Allyn and Bacon.

Hu, S. T. *Elements of General Topology.* Holden Day.

Hurewicz, W. *Lectures on Ordinary Differential Equations.* Wiley.

Ince, E. L. *Ordinary Differential Equations.* Dover.

Kelley, J. L. *General Topology.* Van Nostrand.

Lang, S. *Algebra.* Addison-Wesley.

Titchmarsh, E. C. *Theory of Functions.* Oxford University Press.

Van der Waerden, B. C. *Modern Algebra.* Ungar.

Webster, A. C. *Partial Differential Equations in Mathematical Physics.* Dover.

10.211 Applied Mathematics II

TEXTBOOKS

Halfman, R. L. *Dynamics, Particles, Rigid Bodies and Systems, Vol. I.* Addison-Wesley.
Rutherford, D. E. *Fluid Dynamics.* Oliver and Boyd.

REFERENCE BOOKS

Dettman, J. W. *Mathematical Methods in Physics and Engineering.* McGraw-Hill.
Fowles, G. R. *Analytical Mechanics.* Holt, Rinehart & Wilson.
Shilov, G. *An Introduction to the Theory of Linear Spaces.* Prentice-Hall.

10.221 Applied Mathematics II (Higher)

TEXTBOOKS

Huang, K. *Statistical Mechanics.* Wiley.
McCuskey, S. W. *Introduction to Advanced Dynamics.* Addison-Wesley.
Rutherford, D. E. *Fluid Dynamics.* Oliver and Boyd.

REFERENCE BOOKS

Becker, R. and Sauter. *Electromagnetic Fields and Interactions, Vol. I.* Blackie.
Dettman, J. W. *Mathematical Methods in Physics and Engineering.* McGraw-Hill.
Goldstein, H. *Classical Mechanics.* Addison-Wesley.
Landau, L. D. and Lifshitz, E. M. *Fluid Mechanics.* Pergamon.
Shilov, G. *An Introduction to the Theory of Linear Spaces.* Prentice-Hall.

10.212 Applied Mathematics III

TEXTBOOKS

Becker, R. and Sauter. *Electromagnetic Fields and Interactions, Vol. I.* Blackie.
Conte, S. D. *Elementary Numerical Analysis.* McGraw-Hill.
Schiff, L. I. *Quantum Mechanics.* 2nd ed., International Student ed., McGraw-Hill.

REFERENCE BOOKS

Bullen, K. E. *Introduction to the Theory of Seismology.* C.U.P.
Courant, R. and Hilbert, D. *Methods of Mathematical Physics,* Vol. I Interscience.
Feller, W. *An Introduction to Mathematical Probability and its Applications.* Wiley.
Jackson, J. D. *Classical Electrodynamics.* Wiley.
Landau, L. D. and Lifshitz, E. M. *Quantum Mechanics.* Pergamon.
Lighthill, M. J. *Fourier Analysis and Generalised Functions.* C.U.P. (paperback).
Merzbacher, E. *Quantum Mechanics.* Wiley Toppan.
Messiah, A. *Quantum Mechanics. Vols. I, II.* North Holland.
Ralston, A. *A First Course in Numerical Analysis.* McGraw-Hill.
Whittaker, E. T. and Watson, G. N. *A Course in Modern Analysis.* C.U.P.

10.222 Applied Mathematics III (Higher)

TEXTBOOKS

Conte, S. D. *Elementary Numerical Analysis.* McGraw-Hill.
Lawden, D. F. *Tensor Calculus and Relativity.* Oliver and Boyd.
Merzbacher, E. *Quantum Mechanics.* Wiley Toppan.
Tralli, N. *Classical Electromagnetic Theory.* International Student ed., McGraw-Hill.

REFERENCE BOOKS

As for 10.212, but in addition
Bergmann, P. G. *Introduction to the Theory of Relativity.* Prentice-Hall.
Einstein, A. and Others. *The Principle of Relativity.* Dover.
Landau, L. D. and Lifshitz, E. M. *Classical Theory of Fields.* Pergamon.
Landau, L. D. and Lifshitz, E. M. *Statistical Physics.* Pergamon.
Moller, C. *Theory of Relativity.* C.U.P.
Pauli, W. *Theory of Relativity.* Pergamon.

10.223 Applied Mathematics IV

TEXTBOOKS

Blatt, J. M. and Weisskopf, V. F. *Theoretical Nuclear Physics.* Wiley.
Kittel, C. *Introduction to Solid State Physics.* 3rd Ed., Wiley.
Landau, L. D. and Lifshitz, E. M. *Statistical Physics.* Pergamon.
Merzbacher, E. *Quantum Mechanics.* Wiley Toppan.
Rushbrooke, G. S. *Introduction to Statistical Mechanics.* Clarendon.

REFERENCE BOOKS

Alfven, H. and Falthammar, C. *Cosmical Electrodynamics.* Oxford U.P.
Ginzberg, V. L. and Syrovatskii, S. I. *The Origin of Cosmic Rays.* Pergamon.

Graduate Lectures

TEXTBOOKS

Abrikosov, A. A., Gorkov, L. P. and Dzyaloshinski, I. E. *Quantum Field Theoretical Methods in Statistical Physics.* 2nd ed., Pergamon.
Bremermann, H. *Distributions, Complex Variables and Fourier Transforms.* Addison-Wesley.

10.311 Theory of Statistics I

10.321 Theory of Statistics I (Higher)

INTRODUCTORY READING

Bross, I. D. J. *Design for Decision.* Macmillan.
Huff, D. *How to Lie with Statistics.* Gollancz.
Moroney, M. J. *Facts from Figures.* Pelican.
Tippett, L. H. C. *Statistics.* Oxford University Press.

TEXTBOOKS

Hogg, R. V. and Craig, A. T. *Introduction to Mathematical Statistics.* Macmillan.
Kendall, M. G. and Stuart, A. *The Advanced Theory of Statistics,* Vols. I and II. Griffin.
Statistical Tables.

REFERENCE BOOKS

Anderson, R. L. and Bancroft, T. A. *Statistical Theory in Research.* McGraw-Hill.

Goldberg, S. *Probability: An Introduction.* Prentice Hall.

Mood, A. M. and Graybill, F. A. *Introduction to the Theory of Statistics.* McGraw-Hill, 2nd ed.

Parzen, E. *Modern Probability Theory and its Applications.* Wiley.

Pearson, E. S. and Hartley, H. O. *Biometrika Tables for Statisticians.* Cambridge.

Rao, C. R. *Advanced Statistical Methods in Biometric Research.* Wiley.

10.312 Theory of Statistics II

10.322 Theory of Statistics II (Higher)

INTRODUCTORY READING

Cox, D. R. *Planning of Experiments.* Wiley.

TEXT BOOKS

Cochran, W. G. and Cox, G. M. *Experimental Design.* Wiley.

Feller, W. *An Introduction to Mathematical Probability and its Applications.* Wiley.

Graybill, F. A. *An Introduction to Linear Statistical Models.* McGraw-Hill.

Pearson, E. S. and Hartley, H. O. *Biometrika Tables for Statisticians.* Cambridge.

REFERENCE BOOKS

Anderson, T. W. *An Introduction to Multivariate Statistical Analysis.* Wiley.

Bailey, N. J. T. *The Elements of Stochastic Processes with Applications to the Natural Sciences.* Wiley.

Cochran, W. G. *Sampling Techniques.* Wiley.

Cox, D. R. *Planning of Experiments.* Wiley.

Finney, D. J. *Statistical Methods for Biological Assay.* Griffin.

Gass, S. R. *Linear Programming—Methods and Applications.* McGraw-Hill.

Kempthorne, O. *The Design and Analysis of Experiment.* Wiley.

Mood, A. M. and Graybill, F. A. *Introduction to the Theory of Statistics.* McGraw-Hill.

Rao, C. R. *Advanced Statistical Methods in Biometric Research.* Wiley.

10.323 Theory of Statistics III

TEXT BOOKS

As for 10.322.

REFERENCE BOOKS

Anderson, T. W. *An Introduction to Multivariate Statistical Analysis.* Wiley.

Bharucha-Reid, A. T. *Elements of the Theory of Markov Processes and their Applications.* McGraw-Hill.

Davies, O. L. (ed.) *Design and Analysis of Industrial Experiments.* Oliver and Boyd.

Feller, W. *An Introduction to Mathematical Probability and its Applications.* Vol. II, Wiley.

Fisher, R. A. *Contributions to Mathematical Statistics.* Wiley.

Fisz, M. *Probability Theory and Mathematical Statistics.* Wiley.

Girshick, M. A. and Blackwell, D. *Theory of Games and Statistical Decisions.* Wiley.

Gnedenko, B. V. *Theory of Probability.* Chelsea.
Karlin, S. *Mathematical Methods and Theory in Games, Programming and Economics,* Vol. I. Addison-Wesley.
Kempthorne, O. *The Design and Analysis of Experiment.* Wiley.
Kendall, M. G. *A Course in Multivariate Analysis.* Griffin.
Kullback, S. *Information and Statistics.* Wiley.
Lehmann, E. L. *Tests of Hypotheses.* Wiley.
Noether, G. E. *Non-parametric Statistics.* Wiley.
Patil, G. P. *Classical and Contagious Discrete Distributions.* Stat. Pub. Co.
Rao, C. R. *Advanced Statistical Methods in Biometric Research.* Wiley.
Sarhan, A. E. and Greenberg, B. G. *Contributions to Order Statistics.* Wiley.
Savage, L. J. *Foundations of Statistics.* Wiley.
Savage, L. J. *The Foundations of Statistical Inference.* Methuen.
Scheffé, H. *The Analysis of Variance.* Wiley.
Siegal, S. *Non-parametric Statistics.* McGraw-Hill.
Takacs, L. *Stochastic Processes.* Methuen.
Wald, A. *Sequential Analysis.* Wiley.
Wald, A. *Statistical Decision Functions.* Wiley.
Wetherill, G. B. *Sequential Methods in Statistics.* Methuen.

10.331 Statistics

TEXT BOOKS

Miller, I. and Freund, J. *Probability and Statistics for Engineers.* Prentice Hall.

Statistical Tables.

REFERENCE BOOKS

Bennett, C. A. and Franklin, N. L. *Statistical Analysis in Chemistry and the Chemical Industry.* Wiley.
Davies, O. L. (ed.) *Statistical Methods in Research and Production.* Oliver and Boyd.
Steel, R. G. D. and Torrie, J. H. *Principles and Procedures of Statistics.* McGraw-Hill.

SCHOOL OF PHYSICS

It may be fitly said that the science of Physics underlies all experimental science. It is by the work of physicists that the deepest present understanding of the inanimate world around us has been attained; and it is only with comprehension of their physical aspects that the nature and qualities of living (and of thinking) beings can be properly appreciated. Moreover, principles and techniques of Physics are to be seen everywhere incorporated in the technology on which modern civilisation is based.

Thus, a study of Physics leading to some acquaintance with its elements is suitable for inclusion in any curriculum of study. A good working knowledge of at least the older-established parts of Physics is an essential item for engineers and technologists and indeed for those pursuing any other branch of experimental pure science. This school has, therefore, as one of its principal functions, the provision of such courses for the benefit of those not intending to follow a professional career in Physics.

However, the main objective of the School is the education and professional training of physicists. The pass degree course offered is one which seeks to give a broad and balanced treatment of all branches of Physics, without specific emphasis on any branch or topic which may be temporarily prominent. This course precedes an Honours course in which the student's work will be to some extent specialised in certain fields. These studies are provided for within the framework of the Science Course, as sequences which are appropriate for students seeking qualification as professional physicists, whether they intend to engage in research or industrial practice, or to become teachers of Physics.

For a pass degree with a major in Physics it is necessary to complete Physics I, Physics II, and Physics III, Mathematics I is pre-requisite for Physics II, and Pure Mathematics II for Physics III. The Science Course regulations also require the student to complete four other science subjects for a pass degree. These would normally be Chemistry I and one other first year subject, together with one other Group II and one other Group III subject.

The following programmes show typical alternatives, any of which, together with the prescribed general studies subjects, complete requirements for a pass degree.

First Year	Second Year	Third Year
Physics I	Physics II	Physics III
or	Pure Mathematics II	Mathematical Physics
Higher Physics I	Chemistry II	or
Mathematics I	or	Pure Mathematics III
or	Theory of Statistics I	
Higher Mathematics I	or	
Chemistry I	Applied Mathematics II	
Engineering I		
or		
Geology I		
or		
General and Human Biology		

The normal preparation for Physics IV (Honours) is the study of Physics III and Mathematical Physics in the Third Year. Students intending to study for Honours and/or proceed to a higher degree should include these subjects in their programme.

Physics Prizes

The following prizes are offered annually.

The School Prize, for the best performance in Physics II, value $40.

The Physics Staff Prize, for the best performance in Physics III, value $60.

The Head of School's Prize, for the best performance in laboratory work in Physics III, value $20.

The Physics Thesis Prize, for the best Honours thesis of the year, value $40.

The G. P. Falls Memorial Prize, for the best performance in Mathematical Physics, value $20.

PHYSICS TEXT AND REFERENCE BOOKS

1.001 Physics I

1.011 Higher Physics I

TEXT BOOKS

Halliday, D. and Resnick, R. *Physics for Students of Science and Engineering.* Vols. I and II, or combined volume, Wiley, 1960.

Krackhardt, R. H. *Vacuum Tube Electronics.* Merrill Books, 1966.

REFERENCE BOOKS

Feynman, R. P., Leighton, R. B. and Sands, M. *The Feynman Lectures on Physics.* Vols. I and II, Addison-Wesley.

Starling, S. G. and Woodall, A. J. *Physics.* Longmans Green, 1950.

Stephenson, R. J. *Mechanics and Properties of Matter.* 2nd ed., Wiley, 1960.

For 1.011 only—

Tomboulian, D. H. *Electric and Magnetic Fields.* Harcourt, Brace & World, 1965, New York.

1.041 Physics IC (for students taking only one full year of Physics)

TEXTBOOKS

Halliday, D. and Resnick, R. *Physics for Students of Science and Engineering.* Vols. I and II, or combined volume, Wiley, 1960.

REFERENCE BOOKS

Richards, J. A., Sears, F. W., Wehr, M. R. and Zemansky, M. W. *Modern University Physics.* Addison-Wesley, 1960.

Starling, S. G. and Woodall, A. J. *Physics.* Longmans Green, 1950.

Wiedner, R. T. and Sells, R. L. *Elementary Modern Physics.* Allyn and Bacon, 1960.

1.112 Physics II (Science Course)

TEXTBOOKS

Richtmyer, F. K., Kennard, E. H. and Lauritsen, T. *Introduction to Modern Physics.* 5th ed., McGraw-Hill.

Symon, K. R. *Mechanics.* 2nd ed., Addison-Wesley, 1960. (Recommended for those proceeding to Physics III.)

or

Stephenson, R. J. *Mechanics and Properties of Matter.* 2nd ed., Wiley, 1960.

Zemansky, M. W. *Heat and Thermodynamics.* McGraw-Hill.

or

Bleaney, B. I. and Bleaney, B. *Electricity and Magnetism.* O.U.P., 1959.

Jenkins, F. A. and White, H. E. *Fundamentals of Optics.* 3rd ed., McGraw-Hill, 1957.

Sears, F. W. *Thermodynamics.* Addison-Wesley, 1959.

1.113 Physics III (Science Course)

TEXTBOOKS

Corson, D. and Lorrain, P. *Introduction to Electromagnetic Fields and Waves.* Freeman, 1962.

Eisberg, R. M. *Fundamentals of Modern Physics.* Wiley, 1961.

Herzberg, G. *Atomic Spectra and Atomic Structure.* Dover Publications, 1944.

McDaniel, E. W. *Collision Processes in Ionised Gases.* Wiley, 1964.

Wannier, G. H. *Statistical Physics.* Wiley, 1966, London.

REFERENCE BOOKS

Heavens, O. S. *Optical Masers.* Methuen, 1964.

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

Messiah, A. *Quantum Mechanics.* Vol I, North Holland Pub. Co., 1961.

Panofsky, W. K. H. and Phillips, M. *Classical Electricity and Magnetism.* 2nd ed., Addison-Wesley, 1962.
von Engel, A. *Ionised Gases.* O.U.P., 1965.
White, H. W. *Introduction to Atomic Spectra.* McGraw-Hill, 1934.

1.133 Mathematical Physics (Science Course)

TEXTBOOKS

Long, R. R. *Mechanics of Solids and Fluids.* Prentice-Hall, 1961.
Messiah, A. *Quantum Mechanics.* Vol. I, North Holland Pub. Co., 1961.
Nye, J. F. *Physical Properties of Crystals.* O.U.P., 1957.
Pauli, W. *Theory of Relativity.* Pergamon Press, 1958.
Weatherburn, C. E. *Mathematical Statistics.* C.U.P., 1957.
Wax, N. *Selected Papers on Noise and Stochastic Processes.* Dover Pubs., 1954.

REFERENCE BOOKS

Landau, L. D. and Lifshitz, E. M. *Theory of Elasticity.* Pergamon Press, 1960.
Mood, A. M. *Introduction to the Theory of Statistics.* McGraw-Hill, 1950.
Phillips, F. C. *An Introduction to Crystallography.* Longmans Green, 1957.
Powell, J. L. and Craseman, B. *Quantum Mechanics.* Addison-Wesley, 1961.

1.212 Physics (Applied Chemistry Course)

TEXTBOOKS

Halliday, D. and Resnick, R. *Physics for Students of Science and Engineering.* Vols. I and II, or combined volume, Wiley, 1960.
Wehr, M. R. and Richards, J. A. *Physics of the Atom.* Addison-Wesley, 1960.

REFERENCE BOOK

Jenkins, F. A. and White, H. E. *Fundamentals of Optics.* 3rd ed., McGraw-Hill, 1957.

DEPARTMENT OF OPTOMETRY

The Optometry Department of the School of Physics provides a four year full-time degree course in Optometry leading to the degree of Bachelor of Optometry (B.Optom.) which may be awarded at the pass or honours level. The Optometry course offered at the University of New South Wales is the only course of professional training for optometrists given in New South Wales.

The first year of the Optometry course comprises the first year subjects of Physics, Chemistry, Mathematics, and General and Human Biology, and this is followed by a three-year professional course in Optometry.

Instruction in Clinical Optometry, which forms the main part of the final year, is given in the University's Optometry Clinic,

where each student examines and treats about 15 patients per week. In addition to the prescribed clinical work, the final year students may also participate in the specialised clinical research activities of the department which include orthoptic clinics, clinics for subnormal vision patients and remedial reading clinics for reading-deficient children.

Facilities for individual research are available. Graduates wishing to pursue their studies in optometry beyond the Bachelor of Optometry level may enrol with the University as candidates for the degrees of Master of Science or Doctor of Philosophy.

OPTOMETRY—FULL-TIME COURSE

Bachelor of Optometry

First Year

(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
1.041	Physics IC	3 — 3
2.001 2.011	Chemistry I *or* Higher Chemistry I	2 — 4
10.001 10.011 10.021	Mathematics I *or* Higher Mathematics I *or* Mathematics IT	4 — 2
17.001	General and Human Biology	3 — 3
		12 —12

Second Year

(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
1.811	Optometry I	4 — 4
1.821	Special Anatomy and Physiology	3 — 3
73.011	Physiology I	3 — 6
26.501 26.571	English *or* An Introduction to Modern Drama	1 — ½
		11 —13½

Third Year
(30 weeks' day course)

		Hours per week for 3 terms Lec. Lab./Tut.
1.812	Optometry II	8 — 7
1.831	Diseases of the Eye	2 — 1
12.001	Psychology I	3 — 2
	Two General Studies Electives	2 — 1
		15 —11

Fourth Year
(30 weeks' day course)

		Hours per week		
		Term 1 Lec. Lab./ Tut.	Term 2 Lec. Lab./ Tut.	Term 3 Lec. Lab./ Tut.
1.813	Optometry III	6 — 0	6 — 0	6 — 0
1.841	Clinical Optometry	0 — 14	0 — 14	0 — 15
12.741	Psychology	2 — 0	2 — 0	2 — 0
74.001	Indication for Medical Referral	1 — 0	1 — 0	0 — 0
	Advanced General Studies Elective	2 — 0	2 — 0	2 — 0
		11 — 14	11 — 14	10 — 15

OPTOMETRY TEXT AND REFERENCE BOOKS

1.811 Optometry I

TEXTBOOKS

Fincham, W. H. A. *Optics*. Hatton Press.
Emsley, H. H. *Visual Optics*. Vols. I and II. Hatton Press.

REFERENCE BOOKS

Emsley and Swaine. *Ophthalmic Lenses*. Hatton Press.
Jenkins and White. *Fundamentals of Optics*. McGraw-Hill.
Andrews, C. J. *Optics of the Electromagnetic Spectrum*. Prentice-Hall.
Sears, F. W. *Optics*. Addison-Wesley.
Rossi, B. *Optics*. Addison-Wesley.
Curry, C. *Wave Optics*. Arnold.
Emsley, H. H. *Aberrations of Thin Lenses*. Hatton Press.
Helmholtz, H. *Physiological Optics*. Dover.
Morgan, J. *Introduction to Geometrical and Physical Optics*. McGraw-Hill.

1.812 Optometry II

TEXTBOOKS

Harrington, D. O. *The Visual Fields*. Mosby.
Sasieni, L. S. *The Principles and Practice of Optical Dispensing and Fitting*. Hammond.

Bier, N. *Correction of Sub-normal Vision.* Butterworths.
Gray, S. W. *The Teaching of Reading and Writing.* Unesco.

REFERENCE BOOKS

Berens and Zuckerman. *Diagnostic Examination of the Eye.* Lippincott.
Berliner, S. *Biomicroscopy of the Eye.* Hoeber.
Davson, H. *The Eye,* Vols. 3 and 4. Academic Press.
Dolch, E. W. *A Manual for Remedial Reading.* The Gerrard Press.
Doggart, J. H. *Ocular Signs in Slit-lamp Microscopy.* Kimpton.
Dowaliby, M. *Modern Eyewear Fashion and Cosmetic Dispensing.* Professional Press.
Duke-Elder, Sir S. *The Practice of Refraction.* Churchill.
Duke-Elder, Sir S. *Textbook of Ophthalmology.* Kimpton.
Flesch, R. *Why Johnny Can't Read.* Harper.
Giles, G. H. *The Practice of Orthoptics.* Hammond.
Giles, G. H. *The Principles and Practice of Refraction.* Hammond and Hammond.
Goddard, N. L. *Reading in the Modern Infants School.* University of London.
Harris, A. J. *How to increase Reading Ability.* Longmans.
Hartridge, H. *Recent Advances in the Physiology of Vision.* Churchill.
Hay, J. and Winger, C. E. *Reading with Phonics.* Lippincott.
Heilman, A. W. *Principles and Practice of Teaching Reading.* Merrill.
Lyle and Jackson. *Orthoptics.* Lewis.
McKee, P. *The Teaching of Reading.* Houghton Mifflin.
Ogle, K. N. *Researches in Binocular Vision.* Saunders.
Schonell, F. J. *Backwardness in the Basic Subjects.* Oliver and Boyd.
Schonell, F. J. and Schonell, F. E. *Diagnostic and Attainment Testing.* Oliver and Boyd.
Shapero, Cline and Hofstetter. *Dictionary of Visual Science.* Chilton.
Smith. *Clinical Orthoptic Procedure.* Mosby.
Tait, E. F. *Textbook of Refraction.* Saunders.
Traquair, H. M. *An Introduction to Clinical Perimetry.* Kimpton.
Wolff, M. D. and Wolff. *Remedial Reading.* McGraw-Hill.

1.813 Optometry III

TEXTBOOKS

Burnham, Hanes and Bartleson. *Color.* Wiley.
Grosvenor, T. P. *Contact Lens Theory and Practice.* Professional Press Inc., Chicago, Ill.

REFERENCE BOOKS

Brandt, F. H. *The Psychology of Seeing.* Philosophical Library.
Brindley, G. S. *Physiology of the Retina and the Visual Pathway.* Arnold.
Conrady, A. E. *Applied Optics and Optical Design.* Dover.
Davson, H. *The Eye,* Vol. 4. Academic Press.
Duke-Elder, Sir S. and Perkins, E. S. *Transparency of the Cornea.* Blackwell.
Dudley, L. P. *Stereoptics.* Macdonald.
Duke-Elder, Sir S. *System of Ophthalmology,* Vol. 1. Kimpton.
Emsley, H. H. *Aberrations of Thin Lenses.* Hatton Press.
Gibson, J. J. *The Perception of the Visual World.* Houghton Mifflin.
Hartridge, H. *Recent Advances in the Physiology of Vision.* Churchill.

Haynes, P. L. *Encyclopaedia of Contact Lens Practice.* Internal Optics.
Hirsch and Wick. *Vision of the Aging Patient.* Hammond.
Hofstetter, H. W. *Industrial Vision.* Chilton.
Holmes, C. *Guide to Occupational and other Visual Needs.* Silverlake.
Ittelson, W. H. *The Ames Demonstrations in Perception.* Princeton.
Johnson, B. K. *Optics and Optical Instruments.* Hatton Press.
Le Grand, Y. *Light, Colour and Vision.* Chapman and Hall.
Luneberg, R. K. *Mathematical Analysis of Binocular Vision.* Princeton.
Mandell. *Contact Lens Practice.* Hatton Press.
Martin, L. C. *Technical Optics.* Pitman.
Mazow, B. *Synopsis of Corneal Contact Lens Fitting for Optometrists.* Burgess.
Murray, H. D. *Colour in Theory and Practice.* Chapman and Hall.
Ogle, K. N. *Researches in Binocular Vision.* Saunders.
Optical Society of America. *The Science of Color.* Crowell.
Polyak, S. *The Vertebrate Visual System.* Chicago Univ.
Prince, J. H. *Comparative Anatomy of the Eye.* Thomas.
Prince, J. H. *Ocular Prothesis.* Livingstone.
Sorsby, A. *A Short History of Ophthalmology.* Staples.
Thomas, C. I. *The Cornea.* Thomas.
Thomas, P. F. *Techniques of Prescribing Multiband Microlenses.* Corneal Lens Corp.
Wright, W. D. *Researches in Normal and Defective Colour Vision.* Kimpton.
Wright, W. D. *The Measurement of Colour.* Hilger.

1.821 Special Anatomy and Physiology

TEXTBOOKS

Adler, F. H. *Physiology of the Eye.* Mosby.
Wolff, E. *The Anatomy of the Eye and Orbit.* Lewis.

REFERENCE BOOKS

Duke-Elder, Sir S. *System of Ophthalmology.* Vols. 2, 3 and 4. Kimpton.
Kenney, A. H. *Chronology of Ophthalmic Development.* Thomas.
Mann, I. *The Development of the Human Eye.* Cambridge.
Mann, I. *Developmental Abnormalities of the Eye.* Cambridge.
Spooner, J. D. *Ocular Anatomy.* Hatton Press.

1.831 Diseases of the Eye

TEXTBOOKS

Boyd, W. *An Introduction to the Study of Disease.* Lea and Febiger.
Fairbrother, R. W. *Textbook of Bacteriology.* Heinemann.
Lyle and Cross. *May and Worth's Manual of Diseases of the Eye.* Bailliere.
Perkins and Hansell. *An Atlas of Diseases of the Eye.* Churchill.

REFERENCE BOOKS

Ballantyne and Michaelson. *Textbook of the Fundus of the Eye.* Livingstone.
Doggart, J. H. *Ophthalmic Medicine.* Kimpton.
Doggart, J. H. *Ocular Signs in Slit-lamp Microscopy.* Kimpton.
Duke-Elder, Sir S. *Textbook of Ophthalmology.* Kimpton.
Larsen, H. W. *Atlas of the Fundus of the Eye.* Munsgaard.
Wolff, E. *A Pathology of the Eye.* Lewis.
Wolff, E. *Diseases of the Eye.* Cassell.

GEOGRAPHY

FOR STUDENTS IN THE SCIENCE COURSE

The geographer studies variations from place to place on the earth arising from the spatial relationships of the phenomena making up man's physical and social environment. Apart from its cultural value, an understanding of these relationships is necessary for the conservation and planned development of physical and economic resources. Geography IS should be of particular interest to those studying concurrently in the physical and biological sciences.

Geography IS treats the elements of geography with emphasis on the physical basis. Climatology is introduced in terms of the energy balance of the atmosphere and then, through the hydrologic cycle, as a key to modes of landform evolution and to the major ecosystems and their world distribution. The lithological and structural bases of relief are studied and the land-forming processes of weathering and soil formation, denudation, and deposition are reviewed separately and in relation to life forms in the major ecosystematic complexes. The role of man as a physical geographic agent is also considered in this framework. Types and patterns of rural and urban land use are studied in the context of stages of agricultural and industrial development and of the locational factors involved. Patterns and structures of rural and urban settlements are analysed in functional terms. The interplay of geographic factors is illustrated by interpretative regional studies from southeast Australia and southeast Asia.

Laboratory work comprises the construction and use of maps, the assembly, analysis, and depiction of geographic data and the analysis of air photos.

Lecture, laboratory and tutorial arrangements for Geography IS are as follows:

27.301 Geography IS	Hours per Week for 3 Terms
Lectures	2
Laboratory	3
Tutorials	1
Plus 3 days fieldwork	

GEOGRAPHY TEXT AND REFERENCE BOOKS

27.301 Geography IS

TEXTBOOKS

Alexander, J. W. *Economic Geography*. Prentice-Hall.

Branagan, D. F. and Packham, G. H. *Field Geology of New South Wales*. Science.

Coggins, R. S. and Hefford, R. K. *The Practical Geographer*. Longmans.

Hare, F. K. *The Restless Atmosphere*. Hutchinson.

Longwell, C. L. and Flint, R. F. *Introduction to Physical Geology*. Wiley.

Monkhouse, F. J. and Wilkinson, H. R. *Maps and Diagrams*. Methuen.

In addition all students should possess a modern atlas such as:

Fullard, H. and Darby, H. C. *The University Atlas*. Philip, or *The Oxford Atlas*. O.U.P.

Students will be required to purchase topographic and geologic maps of the Sydney area.

REFERENCE BOOKS

Atlas of Australian Resources. Department of National Development, Canberra.

Bureau of Meteorology. *Manual of Meteorology*.

Chisholm, M. *Rural Settlement and Land Use*. Hutchinson.

C.S.I.R.O. *The Australian Environment*. Melbourne U.P.

Dury, G. H. *The Face of the Earth*. Pelican.

Estall, R. C. and Buchanan, R. O. *Industrial Activity and Economic Geography*. Hutchinson.

Fisher, C. A. *Southeast Asia*. Methuen.

Gregory, S. *Statistical Methods for the Geographer*. Longmans.

Leeper, G. W. *Introduction to Soil Science*. Melbourne U.P.

Mayer, H. M. and Kohn, C. F. (eds.). *Readings in Urban Geography*. Chicago U.P.

Odum, E. R. *Ecology*. Modern Biology Series.

Rutherford,. J., Logan, M. I. and Missen, G. J. *New Viewpoints in Economic Geography*. Martindale.

Thomas, W. L. (ed.). *Man's Role in Changing the Face of the Earth*. Chicago U.P.

Wooldridge, S. W. and East, W. G. *The Spirit of Geography*. Hutchinson.

NOTE: Two excursions must be attended, cost $4.00. Students will be required to purchase equipment and maps for laboratory classes, approximate cost $12.00.

STUDENT'S TIMETABLE

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9-10					
10-11					
11-12					
12-1					
1-2					
2-3					
3-4					
4-5					
5-6					
6-7					
7-8					
8-9					

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